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THE BUILDING NEWS

AND

ENGINEERING JOURNAL.

VOLUME THE THIRTY-NINTH.

JULY TO DECEMBER, 1880.

PUBLISHED (FOR THE PROPRIETOR) BY E. J. KIBBLEWHITE
AT THE OFFICE OF THE "BUILDING NEWS,"
31, TAVISTOCK STREET, COVENT GARDEN, LONDON, W.C

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THE BUILDING NEWS

AND ENGINEERING JOURNAL.

THE PROFESSORSHIP OF ARCHÆOLOGY AT UNIVERSITY COLLEGE.

WE are glad to hear that a well-earned compliment has been paid to Mr. C. T. Newton, C.B., of the British Museum, by the Council of University College, in appointing him to fill a chair of Archæology in that institution. It is no less satisfactory to find the University College authorities have resolved to promote the study of archæology in the same thorough manner as they are doing that of architecture, engineering, and other sciences. We are sure that no gentleman better fitted than Mr. Newton, who has been the keeper of the Greek and Roman antiquities in the British Museum for so many years, could have been appointed. Moreover, as the colleague of Mr. T. Hayter Lewis, the learned professor of Architecture at the same college, no one, probably, could have better appreciated the genius and spirit of Greek art. We are not yet informed what the course of study will be; but we understand a series of lectures will shortly be commenced upon a systematic plan which cannot fail to be both instructive and interesting to a large class of art-students and architects, who may wish to embrace the opportunity of supplementing their historical and architectural knowledge by an acquaintance with archæology. As the commencement of a school of archæology, the election will be welcomed by all interested in the systematic promotion of archæological science. It is no exaggeration to say the study is now pursued after a very desultory and haphazard fashion. We have no proper school for instruction, and no means of obtaining correct data, or ascertained facts, except by the study of recondite and often inaccessible volumes. Mr. Newton's admirable course of peripatetic lectures periodically given in the British Museum, reports of which we have recently published, afford the only satisfactory means of instruction in Greek art at present within the reach of the public. With the unbounded wealth of the British Museum to his hand, arranged in methodical order, the student may practically, so to speak, become familiar with any period of Classical archæology. The fragments from Egypt, the collections of Layard, and of Lord Elgin, the Townley marbles, the marbles recovered by Sir Charles Fellowes from the buried cities of Lycia, the valuable bronzes and coins bequeathed by Payne-Knight, the interesting remains of the famed mausoleum at Halicarnassus, brought home by Mr. Newton; and, lastly, the recent acquisitions from Ephesus, recovered from the buried ruins of its temple by Mr. J. T. Wood, are all within his reach. To instance the sculptures known as the Elgin collection, what better schooling in the beauty and refined grace of Greek art could be sought than the sculptures in the frieze of the Parthenon, upon which Mr. Newton occasionally descants to small, but highly-appreciative, audiences? Yet, ever since the date of the acquisition of these precious fragments early in the present century, which cost the nation £35,000, they have been lying comparatively neglected, and useless for all purposes of instruction, till the present keeper called attention to them. Then there are the beautiful Phigaleian marbles, associated with the name of the late Mr. C. R. Cockerell, equally worthy of study, but not generally accessible to the student, simply because he hardly knows their connection in the history of art. With the exception of a mere smattering of Mediæval art, the young architect knows little or nothing of Classical archæology as a rule, and the finest examples of composition and sculptured decorations—those of the pediments and frieze of the Parthenon—are a sealed book to him. The collection, as a whole, opens up other very interesting inquiries, which it is the province of the archæologist to investigate. Thus, for instance, the origin of Greek orders has been a theme of controversy for ages; but in the Lycian, Elgin, and other galleries the history of the development of the Ionic can be fully traced. The beautiful fragments taken from the Erechtheum, a hexastyle temple of the fifth century before Christ, and those from other examples, enable the student of Classic to see the growth of the order; in a similar manner as the study of Greek coins enables the numismatist to read the successive phases of Greek art. It has been asserted that no monuments or sculptures of this period enable this knowledge to be obtained so easily as the study of coins, as they furnish the local conceptions of gods and heroes, the portraits of emperors, weights, and a variety of other data obtainable in no other way. But to the architect, a few classified fragments from the actual buildings or some of the sculptures reveal an insight into a number of collateral subjects, while the subject of cuneiform inscriptions on Assyrian and other monuments is another fruitful source, and each become to those who will be at the trouble of comparing and analysing them—like fossils to the geologist—an unerring test of age.

It is, perhaps, hardly known that our British Museum contains the richest collection of Greek art in Europe, while in archaic sculpture there is no other gallery in the world that can compete with it; yet the wealth it possesses is scarcely made available from the absolute want of means to introduce it. In other countries, the sculptures of Phidias, the Panathenaic Festival, the sculptured slabs of ancient Assyrian art, and the fragments unearthed at Ephesus, Lycia, and Halicarnassus, would form nuclei of schools devoted to archæology and art.

While, however, the treasures of our national collections are at present doing little towards helping on the study of archæology and architecture, the former is left to a few societies, and to individuals who in many cases take to it as a mere hobby. What we chiefly complain of is that the work is spasmodically done. A society, or a few individuals, busy themselves in opposing the restoration of a church, or, it may be, in setting their face against the very measures which would prolong the existence of a building, while they do literally nothing towards instructing the rising architects in an art with which they claim such sympathy when its examples are well-nigh given over to decay.

A well-organised school of archæology will do much to aid the hands of those who wish to place the study upon a more satisfactory footing than it is at present. Archæology has been too long to a considerable extent the pastime of amateurs, ladies, and clergymen, bent rather upon enjoying a pleasant outing—especially the luncheon, than on serious study of the examples visited. The annual meetings of the archæological societies have afforded too often merely a display of desultory banter and gossip; and the papers read at meetings are frequently the opinions and crotchets of theorists, who have little real knowledge of the principles of induction, and less acquaintance with the details of archæological research. Of late the study has assumed far more comprehensive proportions than it was formerly supposed to comprehend. It is partly in the condition of geology, partly exact, as in the domain of numismatics and inscriptions. Primitive antiquities have opened a large field of inquiry, and the functions of the archæologist now extend to palæontological facts, though the evidence of the two sciences are distinct. Archæology has been declared by undoubted authorities to form an intermediate link between geology and history. It is true it is difficult to determine the close of the geological and the beginning of the archæological periods, but it may suffice to know that in the latest diluvial formations vestiges of the human species and of human art appear. But to narrow our inquiries to the period at which the ages known as the Stone, the Bronze, and the Iron began, archæologists have discovered the Stone period to have had a greater duration than was at first supposed. They have divided that period into two parts ; and the discoveries in France, Denmark, and Sweden have given a fresh interest to the study of prehistoric archæology. Caves, barrows, chambered cairns, and other sepulchral remains, are now dealt with in a manner that proves the advantage of a course of scientific study, including the evidences furnished by palæontology and ethnology. If archæology is ever to assert the dignity of a science, to become a useful aid to the historian, or to other sciences, it must take account of the various arts, which in their turn throw light upon it. Architecture, sculpture, ceramic art, numismatics, ornamentation, ought each to be made a subject of study ; each has an historical value in the successive styles which marked its development. Classical archæology is a branch that has been left to a few *savants*, but as no means for its proper study is, as we have seen, within the reach of architects and sculptors, so the archæologist is often ignorant of architecture as an art, and seldom brings to the investigation of his work the technical knowledge of detail necessary to a perfect interpretation of certain remains. To this end archæologists and architects should work hand-in-hand, a condition now rendered almost impracticable from the want of interest in each others avocation. We have few like Winckelmann, with his scientific method of research. Antiquaries are too often mere dreamers, architects too shut up within the narrow domain of their technical art. Hence, it is time the subject should be taken up by those who have the undoubted advantage of a large experience, who have studied the consecutive phases of the subject from actual contact with antiquities in its numerous branches, and who have a large collection at command. If the archæological societies who now spend their time on excursions had the welfare of the science at heart they would unite for the purpose of instituting schools for the study of archæology, Classical and British, and would help towards the dissemination of sound views. At the British Museum the antiquities of the British Islands are scarcely visited by the student. There is a large collection of antiquities previous to the Roman invasion, embracing the Stone, Bronze, and Iron periods; another collection, found in Britain, of Roman manufacture ; and several cases of Anglo-Saxon antiquities. There is also an Early Christian and a Mediæval collection of much interest. Why are not these made more available for the instruction of the student? Cannot our antiquaries assist towards so desirable an end, by making these and local collections centres of popular interest?

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A RECENT VISIT TO RUSSIA.

IN speaking of the contents of the Hermitage Palace as a part of the great Winter Palace at St. Petersburg, we may note that it is but scantily furnished. The seats and chairs, where they occur, are treated in white and gold, and upholstered in maroon velvet. The side and centre tables in their lower parts are mostly of gilt bronze ; but in some instances they are of marble, and inlaid with the same description of precious stone that forms the tops. These are mostly in malachite, and of considerable size, viz., 6ft. 0in. by 3ft. 6in. in the instance of the tables, and 5ft. high in that of the vases; but in the Spanish Gallery, which is one of the principal rooms, the tables, two in number, are 7ft. by 3ft 6in. in size. These are faced with lapis lazuli. In this material there are in the same apartment two square-top vases, and one circular ditto, of considerable size. These in their moulds and decorative parts are of gilt bronze, the effect of which, against the divine hue of this costly stone, is far more charming than is the case with the greener and less costly malachite. We have in this palace a finer opportunity of judging of the beauty of these native stones, than was the case with the far-famed screen of the St. Isaac Cathedral, from the fact that they are here brought under a powerful overhead light. The malachite is variant in its vernal hues, and a material possessing a considerable amount of grain or stratification. Advantage has been taken of the latter inasmuch as the artists have matched the fragments of stone in colour and in grain, with the view of destroying what might otherwise prove a monotonous surface. The general effect is that of broad lines of the various-tinted stones coursing across the field or face of the tables; this feature i still more highly elaborated by these line or shades of colour being waved, an effec that is obtained by cutting the veneers or plates of stone from nodular blocks of malachite. The result on the whole is very pleasing, and the impression we form is that the lapidaries could carry the work no further in the direction of superiority. The same effect is gained with the colossal vases, which present themselves to the ordinary observer as being wrought from solid blocks of highly-figured, veined, or stratified malachite. We noticed that in all cases the gilt-bronze mountings of these costly objects was less pleasing in effect against this green ground, than was the case with the blue ground of the lapis lazuli. This is traceable to the fact that the former has yellow in its composition. It is an instance of a primary colour (yellow gold) being brought into contrast with a compound colour (green), when that compound is closely related to the primary. With the lapis-lazuli we have no such violation of the laws of colour, the contrast is more positive or pronounced, being that of the primaries blue and yellow (gold). The effect in this case is rich in the extreme, and the objects stand out from their costly surroundings with a degree of force and character that would not be obtained in any other material. We spoke of the grain or figure thrown into these broad faces of polished malachite, and, before parting with the subject of this highly-wrought lapidary work, we may note, that in the great tables of lapis-lazuli, and other classic objects wrought in this material, there is no attempt at grain, stratification, or bands or shades of colour, from the simple fact that the material is in the form of an amorphous crystal. The fragments are jointed with the greatest amount of care and judgment, the prime object being to avoid contrast in shade or colour, where the joints occur. The charm of this material lies in its divinity of colour, and in its rich transparency which amounts to luminosity. In the cutting of this stone, numerous grains of silver are met with, a feature that is seized upon by the artists to impart somewhat of the character of stratification to the face or field of this material. The impression we receive after viewing these costly objects in this their native sphere, is that they were primarily wrought by Imperial command to represent this northern empire in some European exhibition, with the secondary view of finding a permanent resting-place within the walls of this palace, for we can scarcely believe that works of this kind could be produced in the present day without some attempt being made to bring them under the notice of the people of other lands. Side by side with these costly works are others not less remarkable in their specialities ; such, for instance, as great vases, wrought out of single blocks of dove-coloured porphyry, and other rare and costly native marbles.

In some cases we noticed candelabra and tazzas, wrought in violet-coloured Siberian jasper ; in other cases the tazze wrought in syenite, aventurine, and fine jasper, and candelabra in rhodonite and other precious materials.

The sculpture is in most cases modern, and the work of Vitali, Göthe, Houdon, Bienaime, and others. The Italian gallery contains an unfinished work by Michael Angelo, called the "Tour de Force." It is a crouching figure which appears to have been wrought without either rule, compass, or model, from a rough block of marble, as if to show what this artist could produce with the aid of his mighty genius, from the smallest amount of material.

Near this is a marble group by Lorenzello, of "a boy carried by an eagle," after a model by Raphael. This is remarkable as being one of the only two pieces of sculpture with which Raphael's name is associated; the other is in a church in Rome. The history of this work is somewhat chequered during the last century. In 1787 it was purchased by command of Catherine II. from a Mr. Browne, of Wimbledon. As a work of art in the hands of the Imperial family it was subsequently lost. In 1872 it was discovered in a store-room of the Winter Palace, and placed in its present position.

Amongst the best of the statuary may be noted a work by Canova, bearing the title of "Paris," and another in bronze, a statue of John the Terrible, by a native artist, "Antonofsky." Of other works we may notice a table of fine *pietra dura*, with silver mountings ; a present from the King of Italy in 1873. In an adjoining room, to which the public are not generally admitted, is a more costly table of Roman workmanship, somewhat earlier in date. This was made for the Empress of Russia, mother of the present Emperor. It is very massive, and wrought in the highest quality of mosaics, to represent views of the cities visited by Her Majesty, and statues and pictures most admired by her in Rome. There are also some ivory vases, which are highly interesting in their associations. They were made to the order of Alexander I., from the mammoth remains so largely found in Russia, and presented by him to the Emperor of Japan ; this Oriental magnate returned the gifts, with the remark that he could not condescend to accept presents from an inferior.

The select portion of the Hermitage Palace here alluded to is that erected by the Empress Catherine II., with a frontage towards the river Neva, over which it commands a magnificent view. This is used by distinguished visitors ; in 1866 it formed the apartments of H.R.H. The Prince of Wales, and in 1873, of that Oriental potentate, the Shah of Persia. One great feature in this building is the Hall of the Staircase of the Council of the Empire, which is of imposing size and proportions. At the top of this staircase is an immense malachite vase, near which is the pavilion of the Empress Catherine II. This room, used as a select ball-room, is fitted up in white marble, with a gallery of light gilded trellis work, supported on marble columns running round the upper part ; a portion of the floor is mosaic, upon which is placed a pair of fountains, modelled from the celebrated one at Bakhchisarni, in the Crimea; the principal feature of these fountains is that of water falling from a series of ornamental shells.

In one of these rooms, the upper part of the mantelpiece is wrought in mosaic flanked with beautiful columns of costly ribbon jasper. In another, "Peter the Great's Gallery," are some interesting works, directly and indirectly associated with that monarch, with his celebrated successor, Catherine II., and with other high dignitaries. Amongst these works, many of which are of fabulous value, we may note a walking-stick, formerly belonging to the great Catherine, remarkable from the fact that the handle is of blood jasper, the surface of which is thickly encrusted with diamonds of the first water. Another rare and costly work is a large emerald, wrought in the form of a bird; this was formerly a bridal gift, made by King Pedro II., of Portugal, to the Princess of Savoy.

Before noting the works of art in the form of paintings in oil, many of which are of special interest to the English traveller, we will offer a few remarks upon the collections of coins, gems, cameos, which are stored in three of the principal rooms.

This fine collection of coins, now amounting to 200,000 specimens, owes its foundation to Catherine II., from whose reign it has been increased up to the present standard by gifts and purchases. This collection is rich in coins of the antique, both Syrian, Grecian, and Roman, as is the case with certain Asiatic and European kingdoms, now under the sway of the Russian sceptre, and kingdoms which are lost other than in the pages of history. What is most to our purpose is those of the old kingdom of Muscovy which are represented by 8,000 specimens. Some of these are remarkably rude, and as such reflect in a powerful manner the standard of civilisation that obtained in this country in ancient times.

Specimens are here shown of the ancient coins known as "potinas," which were measures or weights of silver current in the 14th and 15th centuries. The weight of these coins is half a pound, and the earliest specimens are without stamp or impression. A century later, the "ruble" came on the scene, the weight of which was one quarter of a pound, and the workmanship somewhat improved.

Perhaps the most curious are the square "copecks" and "half-copecks" of iron, which are supposed to have been current in old times amongst the mining population in the neighbourhood of the White Sea, and the badges, or tokens, the date of which is about 1725, sold by Peter the Great to those who elected to pay a fine for the privilege of wearing their beards.

The English traveller is somewhat astonished to find an important collection of about 1,000 Anglo-Saxon and Danish coins, bearing the impress of our pre-Norman kings. These have been found at various times in different parts of Russia in Europe, where they are supposed to have been carried in exchange for black marten-skins and other products of the chase; for Russia was the "Hudson's Bay" of the old world, and the seat of the ancient fur trade—a trade of no small import at the present day.

The collection of gems and cameos is the largest and the most valuable in the world. These are shown in octagonal cases, with sloping sides, the lower parts of which are tables; these are fixed on the floor of the great gem-room, which is one of the finest in the palace; for here the stately doors and fittings, noticed as being richly inlaid with brass, are to be seen.

This collection is the result of various purchases, the principal one being the celebrated cabinet of the Duke of Orleans (Philippe Egalité), the examples from which are distinguished from others in being framed, or mounted, in dull or mat gold. These gems, many of which are of the highest antiquity, are not arranged in chronological order, the curators preferring to classify them on the basis of the subjects engraved upon them—an arrangement that, to our mind, is somewhat questionable.

This gem-room, as part of its furniture, contains a massive clock, remarkable for the perfection of its mechanism. This imposing work is fitted with a chime of bells, and other musical arrangements, upon which overtures are executed with the precision of a band. It is said to have been won as a prize in a lottery by a poor widow, who sold it to the Czar for £3,000.

(*To be continued.*)

ART TEXT-BOOKS.*

TWO of the new series of illustrated text-books on art education, edited by Mr. E. J. Poynter, R.A., are already before us; one on "Classic and Italian Painting," by Mr. Poynter, R.A., and the other on "Gothic and Renaissance Architecture," by Mr. T. Roger Smith, F.R.I.B.A. In the first volume we find the history of Classic art, and the general summary of Italian art, have been written by Mr. Percy R. Head; while Egyptian art and the schools of Italian painting are from the pen of Mr. Poynter. In this instance the preface is something more than an unnecessary apology: it enters into the reasons why art-teaching should aim at a definite and systematic knowledge as its foundation. The object of these text-books, it informs us, is to provide that "such a knowledge should form part of general education." We cordially agree with Mr. Poynter's remark to the effect that, as Greek and Latin are taught in our public schools, not for the immediate use they will be in after life, but for the preparation they afford us as a basis of the study of etymology of modern languages, so a knowledge of Classical and Italian works of art will be useful to prepare for a taste for art. We quite agree also in the remark that a smattering of drawing is useless, unless under very able direction, towards a cultivation of taste. "Technical knowledge of this kind may exist," very truly, "in an individual in company with the most absolute indifference to any form of art that lies beyond his range of ideas; and there are many cultivated men whose opinion on a work of art is much to be preferred to that of many artists." If a history of the great models and masters of art formed a part of the education in history every boy receives, an interest in and a growth of taste would follow, and considerably supplement by intelligent appreciation the instruction in drawing. The treatises before us make a laudable attempt to supply the deficiency; the book on Classic and Italian painting places before the student well-written introductions to Egyptian and Greek painting, the works of Pompeii and Herculaneum, Byzantine, and Early Christian art, and the great Italian schools, all these being illustrated by wood engravings from the best sources, which engravings are themselves works of art. Every important school has thus been illustrated, and we notice especially one of the works of Francesco Raibolini, generally called Francia, the greatest of the early Bolognese masters, classed here under the Umbrian school. The subject represents the Virgin enthroned, attended by Saints, and is in the Pinacoteca, Bologna. Its composition exhibits the influence of Perugino. Francia was a goldsmith of great repute, and was born in 1450, and only late in life took to painting. He died in 1517, and, according to Vasari, of grief at seeing himself surpassed by the young Raphael. Of course, the schools of Italy take up by far the larger half of the book. They open with an account of the decoration of the Campo Santo at Pisa, and Mr. Poynter very justly insists upon showing that Early Italian painting was, as the art had been in Classical times, the handmaiden of architecture. The greatest works were accomplished in the decoration of churches and public buildings, and the pictures were, if not mural, painted for some "fixed position, for which their effect was calculated." To the last, says the author, "the chief boast of Italy— in a climate where the painter may expose his colours to the air with more boldness than beneath a Northern sky—has been the frescoes and the wide surfaces of canvas or panel, which throw open the whole side of a chapel or a saloon, into a new world of movement and beauty." There was, moreover, a unity of aim in the individual paintings; they were intended to form parts of a scheme of decoration. The biographies begin with Cimabue, the leader of the Florentine school, but Mr. Poynter says he cannot fairly be called the first great Italian painter. Giunto of Pisa, who painted frescoes at Assissi: Guido, of Siena, who painted (1221) the Virgin and Child in the Church of San Domenico, were chief among the earliest regenerators in the 13th century. The names of Andrea Tafi and Gaddo Gaddi, the great mosaic workers, are not forgotten among the earlier artists. These early artists had to struggle against the influence of Byzantine, or Greek traditions, which trammelled art for a long time, and hence their works were transitional. A much greater painter than Cimabue, according to the author, was Duccio di Buoninsegna, the leader of the Sienese school. His "Scenes from the Life of Christ," particularly "The Entombment of the Virgin," part of the altar-piece in sacristy of Siena Cathedral, are powerful in conception, and place Duccio, as a religious artist, in a high place, if not on a par with Giotto. Like Cimabue's "Madonna," Duccio's great altar-piece was carried in procession by the citizens. Giotto is illustrated by three subjects, one a panel fresco of "Christ Among the Doctors," in the Academy of Fine Art, Florence; another one of the series of frescoes in the Arena Chapel at Padua, representing "Joachim retiring to the Sheepfold," and a bas-relief from the Campanile, Florence, entitled "Shepherd Life." Several choice engravings from works by Fra Angelico, Benozzo Gozzoli, Fillipo Lippi, Botticelli, Signorelli, Ghirlandaio, Mantegna, Bellini, Perugino, Da Vinci, Michel Angelo, Raphael, Giogione, Titian, the Carracci, Guido Reni, &c., accompany the biographical and critical notices of these eminent masters. In the works of the earlier masters we discover earnestness and devotional power, expressing itself with difficulty. Those of the 15th century must be studied for their grand decorative treatment, crowded incident and richness of detail, combined with a more masterly power of expression, which gradually gained in strength and richness till we reach the eclectics and mannerists after the period of Raphael. All the characteristic features are clearly pointed out to the student; for example, of those who followed Raphael, a considerable group, including Giulio Romano, Peruzzi, &c., are shown to belong to a decorative school of importance, and the chief aim of the Venetian school was to express human beauty of the highest physical and spiritual kind, while for technical qualities and colouring it stood without a rival culminating in Titian. The author acknowledges his indebtedness to the works of Messrs. Crowe and Cavalcaselle, in

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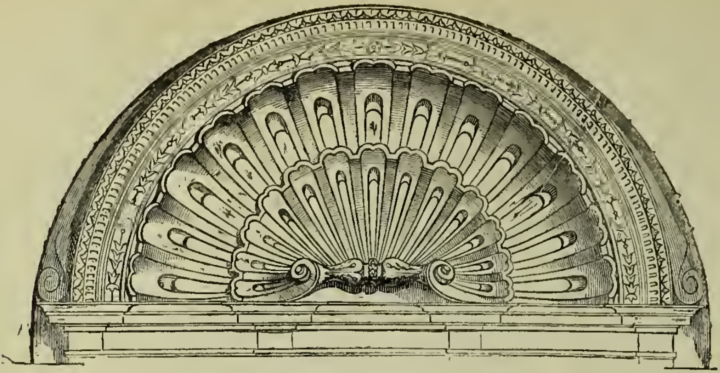
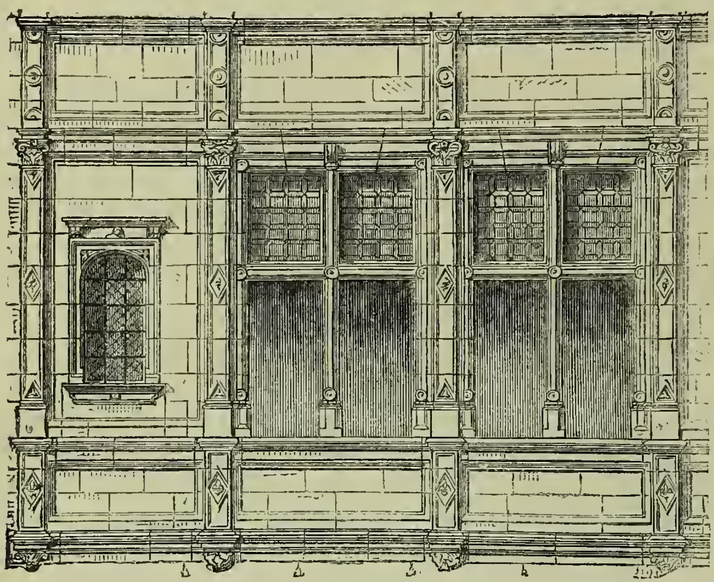
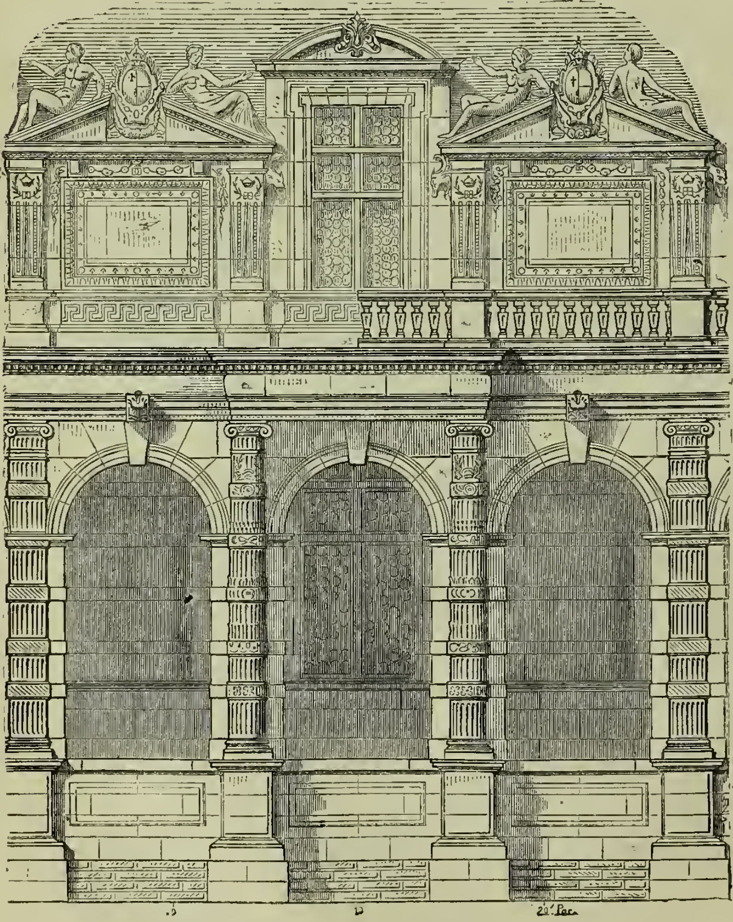
* Art Text-Books. Edited by E. J. Poynter, R.A. London: Sampson Low, Marston, Searle and Rivington, Fleet-street.



ITALIAN RENAISSANCE SHELL ORNAMENT.



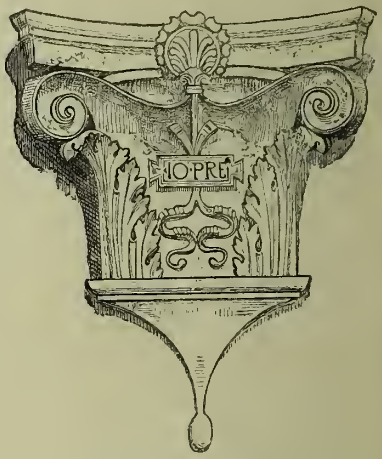
WINDOW FROM A HOUSE AT ORLEANS (EARLY 16TH CENTURY).



PART OF THE TUILERIES, PARIS (BEGUN 1564).

compiling the summaries, though the critical notes are his own. The summary of Classic painting by Mr. P. Head is pretty complete. The preliminary sketches of Egyptian painting and that of Greece are illustrated by characteristic engravings from the tombs and from Pompeii, and are introductory to the schools of Italy. Polygnotus, Dionysius, Micon, Apollodorus, Zeuxis, Apelles, &c., are briefly sketched.

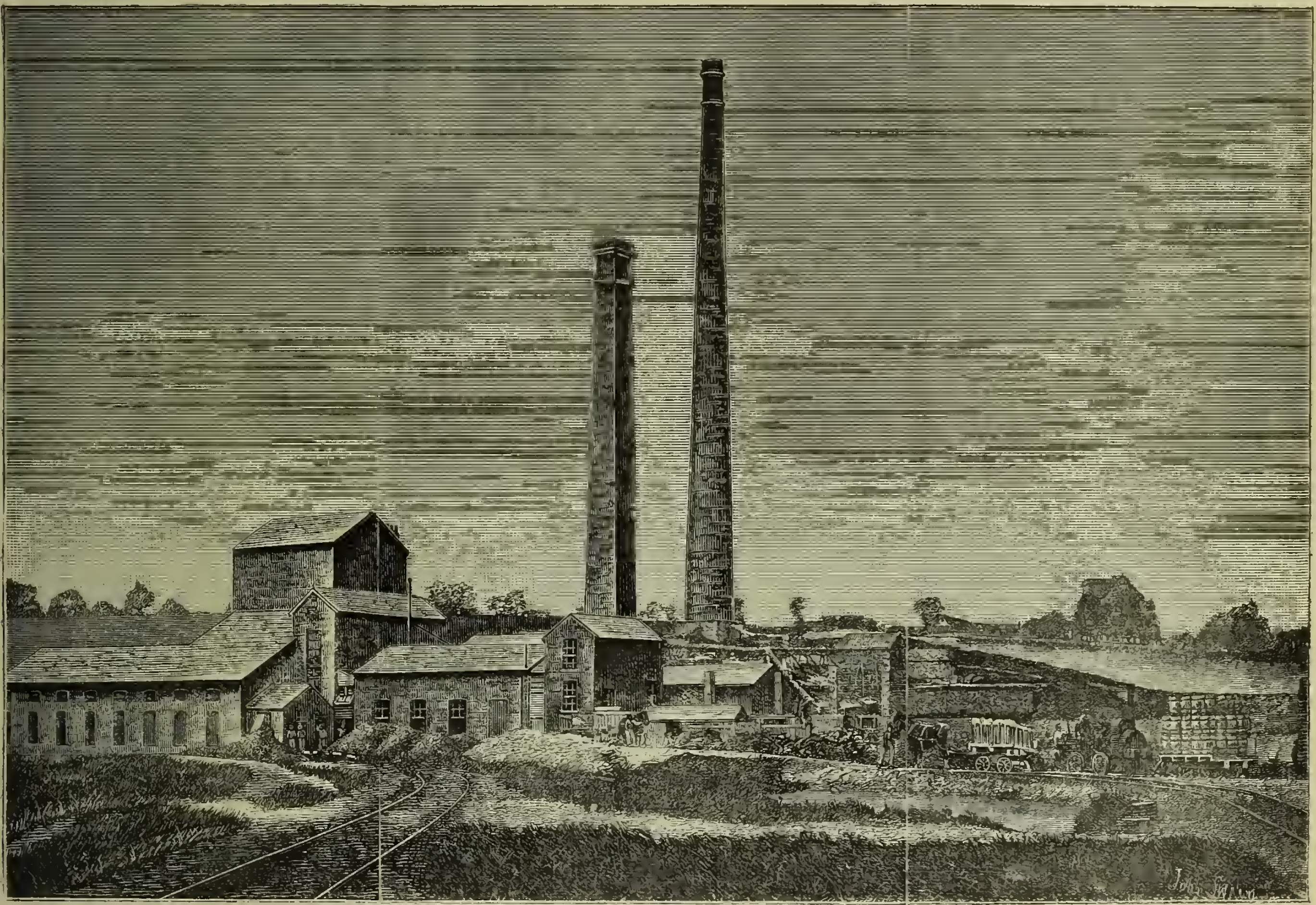
The textbook on "Gothic and Renaissance," by Mr. T. Roger Smith, is confined exclusively to these two last developments of architecture, and is intended to be followed by one of Classic and Early Christian. The author has furnished the student with what we may call a practical exposition of the subject. It is not a mere historical record of styles, having reference to great historic periods of art, but aims at giving the reader some account of the chief classes of buildings, and the leading constructive features of architecture. An illustrated glossary of technical terms precedes the work, which is almost a necessary condition to the study of architecture. Such words as "moulding," "pier," "vault," are explained at some length, and the different kinds of vault are illustrated. The buildings of the Middle Ages form the subject of the first chapter, the definition of the parts of a Gothic cathedral being made a starting-point, after which monastic buildings, military and domestic buildings are described with some detail. This portion of the work is essentially rudimentary in its character. A few good engravings are given to illustrate the principal features and arrangements of ecclesiastical and domestic buildings. The house of Jaques Cœur at Bourges furnishes a good idea of the assemblage of buildings of the latter class, and a plan of Warwick Castle is shown to illustrate the castellated mansion of the time of Richard II. After this general description of building in the concrete, the author proceeds to enter into detail. Chapter III. discusses the subject of the styles or periods of English Gothic architecture. Rickman's nomenclature, besides that of Sharpe is given, and the striking peculiarities of each style are added from Mr. Morant's Notes on English Architecture. But by far the most useful and suggestive portion of the book is devoted to the analysis of buildings. The importance of the plan in an architectural sense is explained by reference to the vicissitudes which marked the east end of Gothic churches. Here a few diagrams would have been useful, explaining the developments of vaulting which arose out of the plan, and the beautiful mechanical expedients to which the Mediæval architects resorted in carrying their vaults. The growth of the pier, or its development from the wall, would perhaps have been more readily compre-



EARLY RENAISSANCE CORBEL.

hended by the student if a few diagrams had been furnished, and the remarks on buttresses would have received additional point. Arches, spires, roofs, ornaments, stained glass, and sculpture, are afterwards described and illustrated after a similar method of treatment. The Gothic of France is discussed and well illustrated. One example, a Doorway at Loches (1180), exhibits the transitional employment of a circular arch, below the pointed form, and some spirited detail and carving; and another of a very different and later phase of Gothic, some houses at Lisieux of the 16th century. The peculiarities of the plans of French cathedrals are pointed out, such as the use of the column instead of the shafted pier, and the frequent omission of buttresses. The Gothic architecture of Belgium, and the Netherlands, and Germany, is briefly touched upon. The Gothic of Italy is treated pretty fully in its main features, and a few good illustrations are furnished to illustrate the style. Spain and Portugal are included in the sketch of the Gothics of Southern Europe. The "Principles of Construction and Design" form a concluding chapter to this section, and indicate a few of the leading principles which the architects of the Middle Ages followed in their design. The concluding chapters treat of Renaissance. After a general sketch of the decadence of Gothic, and the revival of Classical traditions, the author proceeds to consider the plan, walls, columns, openings, and other constructive features in the same analytical method as adopted in the previous chapters on Gothic; after which follows an account of some of the great masters and works of the Revival in Italy, France, Belgium, and England. The illustrations to this part are tolerably complete and representative. Mr. Roger Smith has presented the student with an excellent elementary handbook of the two great divisions of architecture, and although he has gone over a large and well-gleaned field, he has imparted a practical tone to his work. We reproduce four of the illustrations given—one of a curious Early Renaissance corbel; another, showing a beautiful shell ornament, typical of the Early Venetian Renaissance, found in many of the Venetian churches and other buildings; a third from Orleans, showing a clever adaptation of early sixteenth-century work to streets and shops; and a fourth, a portion of the garden front of the Tuileries, commenced in 1564, for Catherine de Medicis, from the designs of Philibert Delorme.

We think the plan adopted of dealing first with buildings and then with their separate parts, has more interest for the general student than the course of commencing with the elements and proceeding upon a synthetic method.



MESSRS. I. C. JOHNSON AND CO.'S CEMENT WORKS, GREENHITHE.

THE MANUFACTURE OF PORTLAND CEMENT.

AN IMPROVED CEMENT MANUFACTORY.

FROM the somewhat crude and incomplete factory of Aspdin, established at Wakefield more than half a century ago, there has been through all these years but indifferent and unsatisfactory progress in improvements, either to cheapen the cost or better the quality of Portland cement. While England, from its favourable position both as regards the command of raw materials (chalk and clay) and fuel at a low cost, assisted by cheap and ready means of transit to every quarter of the globe, secured a monopoly of the trade, but little anxiety or desire arose for changing the original system of manufacture. In addition to those advantages named, a belief existed that Portland cement could only be made from chalk and clay, or mud from the river Medway, in Kent; and to such an extent did this idea prevail, that the early cement makers, in Germany especially, used Medway mud at a very high cost for their first essays in their desire to produce Portland cement. The eminent chemists, however, who soon took charge of the cement question on the Continent, were not long in disabusing the public mind on this point, and it was soon made evident that a good and reliable Portland cement could be produced from other minerals than chalk and clay. This knowledge, accompanied by equally cogent commercial reasons, led to the establishment of foreign Portland cement works, more especially in Germany; and the considerable trade hitherto done with that country by English manufacturers has in consequence dwindled down to comparatively insignificant proportions, and, indeed, we are already beginning to receive supplies of cement from German manufacturers. This somewhat unexpected competition, and the increasing and more intelligent requirements of the engineer and architect, has given an impetus to this great industry which has, as we have already observed, resulted in many useful and satisfactory improvements.

That our readers may better understand the nature and character of the more advanced cement manufacture, we purpose in this essay to give a description and particulars of what may be regarded as the most favourable outcome of recent invention and progress displayed at the manufactory of Messrs. I. C. Johnson and Co., Greenhithe, in Kent. We select these works from their comparative nearness to London, and also in some measure from the fact of Mr. Johnson being the oldest practical cement-maker in England, or indeed, anywhere else. At a recent discussion which took place at the Institution of Civil Engineers, Mr. Johnson stated that he had been a cement-maker for upwards of fifty-five years. The more credit to him, therefore for having been the first to shake off the trammels of, we might almost say, antiquity, and enter upon a system of manufacture which has upset the cherished traditions of the past, and its associated absurdities.

The works at Greenhithe were established with the object of following the new lines of manufacture, and, therefore, it was a comparatively easy task to arrange the plan and machinery to meet the requirements of the altered character of the industry. Favourably circumstanced as regards site, the new works command an inexhaustible supply of the finest chalk, while they are connected by a short line of railway to a wharf on the Thames, so that all the advantages which a cement-works should possess are thus secured. The original object of Mr. Johnson was to avoid the use of an extensive system of "back" or reservoir space, and so hasten the process of manufacture, besides dispensing with the cost of land and buildings involved in their construction and arrangement. At first the experiments in this direction were attended with some difficulty, but eventually they culminated in the unqualified adoption of the "Goreham process" of mixing or washing, and the "Johnson kiln." These works of Messrs. Johnson being placed in a locality near which are dwelling-houses, the production of the gases from the kilns was considered by the surrounding inhabitants as dangerous to health, legal action having been taken to prevent the manufacture of cement in this otherwise favourably situated locality. It was shown, however, that more than ordinary precautions had been taken to avoid the chance of any nuisance, and the result was that the works have been prosecuted not only with profit and credit to their owners, but without inflicting harm or annoyance on their neighbours. Although not far from what may be termed the great Northfleet zone of the cement industry, the works at Greenhithe are comparatively isolated, and one feels surprised that any action could have been taken for their suppression, unless some under-current of interested opposition felt annoyed at the success of a new rival in an industry which some manufacturers doubtless consider as an hereditary privilege. Of course the very nature of the manufacture of cement indicates that in its prosecution a large amount of noxious gases must be eliminated from the raw materials and the fuel by which they are converted. One of the most important gaseous products realised is that of carbonic acid, and unless some effectual means are provided for its careful destruction or dispersion, a danger not only to vegetable but animal life would result. It will be seen, however, from our description of the works at Greenhithe, that every device that means or ingenuity could suggest, have been adopted to secure perfect immunity from danger to the surrounding country or its inhabitants.

Our woodcut gives a fair representation of the works of Messrs. Johnson and Co., and an examination of it will show the peculiarly favourable character of their position, and the originality and skill which have been displayed in their arrangement. What may be regarded as the most important feature in connection with the establishment is the chalk source, and in the quarry immediately behind the works, a face of upwards of 50ft. in depth, proves not only that the quality of that indispensable carbonate of lime ingredient is good, but the supply will be able to withstand the greatest possible run upon it for many years to come. The chalk is as nought, however, if the clay or mud (silica and alumina ingredient) cannot be secured. This has also due attention, and the connection with the river commands a supply from the Medway on the same equally favourable conditions and terms as all the other factories both in the Medway and the Thames. The command of coke (gas), coal, and every other subordinate want are all secured under the best and most convenient conditions. The works may be said to be built on the river level, and, therefore, at little cost, receives the raw materials and, with equal convenience, secures the ready despatch of the manufactured cement by locomotives, which, in the various branches or departments of the industry, are constantly at work.

The cement works at Greenhithe may be considered, at present, as from three to four hundred ton-power manufacture per week, which means the handling and moving of about two thousand tons weight in seven days, besides the water used in mixing the raw materials.

The first, and, we might almost say, the most important building on the works is that at the right-hand corner of the illustration, where the chalk and clay are mixed together, and in which is placed the wash-mill. This machinery of mixture is in duplicate, so that, in the event of accidents, no hindrance to the manufacture can arise. It will be well to explain at this point that the system adopted, and which we are about to describe, involves a continuous operation of washing, owing to the total abandonment of receptacles or backs of storage, an inseparable adjunct of the wet, or old method. The distinctive term "semi-wet process" hardly conveys the meaning of the difference between the two systems, and we, therefore, at starting, give this explanation :—

The wash-mill is the beginning of the manufacture proper, for we cannot recognise the quarrying of chalk or digging of the clay as an operation where technical skill is required. The chalk is brought to the wash-mill by the locomotive, and it, together with the clay, is conveniently arranged so that the workmen readily put into the mill the regulated proportion of the one and the other. The speed of the rotating mill, with its series of iron cutters, is so arranged, and the supply of the materials favourably adjusted to secure a fair reduction or maceration of the now partially-combined chalk and clay. The quantity of water which enters the wash-mill varies from forty to fifty per cent. of the weight of the raw materials. The result is, the production of a thin pasty mass, which is sufficiently fluid to be readily elevated to the hoppers of the horizontal millstones placed in the adjoining building to the left. The act of elevating tends to further perfect the mixture, and after passing through the millstones, which renders the slurry more fluid still, it is pumped or forced to an elevation high enough to secure its flow, by gravitation, to all points of the flues, which form the salient feature in Mr. Johnson's patent kiln. Before entering on further description, we will point out the exact position of these flues on our accompanying woodcut. Adjoining the mill where the slurry from the wash-mill is operated upon are the engine and boiler-houses, and next to these are the cement grinding-mills, and warehouses for storing the cement. On the same level, and immediately behind and parallel to this line of building, at a distance of thirty feet, are the kilns, at present numbering fifteen. At the entrance-height of the kilns (all of which are covered in) are the drying-flues, segmental in form, and about 10ft. high. These flues receive the slurry, which is conveyed by pipes direct from the mixing-millstones and inlets or holes in the arches, readily permit of its dropping down at any desired point. The flues have an inclination of 1ft. in 100ft. rising from the kiln, so that the thickest or deepest part of the wet slurry is at the point nearest the kiln where the greatest heat is produced. When the kiln is lighted the end of the flue is built up and made air-tight, and the flue itself connected to the main heat channel, joined to the main chimney 300ft. high, and thus secures not only a draught for the kiln, but a perfect method of exhausting all the gases which arise during the combustion of the kiln. The inventor of this kiln and its drying adjuncts claims for his system that the slurry being heated and dried from above, is more compact in character, and, therefore, more susceptible to beneficial heat action when placed in the kiln. An objection has been raised by some critics that the heated gases in their passage over the slurry or slip are partially absorbed, and, by such absorption, introduce into the process a new element of distrust or danger. Mr. Johnson, however, to dispose of this objection, has had the following analysis made of the thin deposited scum, or film, resulting from the passage of the heated gases, from which it will be seen that no injurious result from that cause is likely to arise, or even possible.

ANALYSIS.

Water	16·30
Sand	7·50
Alumina	0·91
Oxide of iron	0·72
Sulphate of potash	47·16
Sulphate of soda	7·66
Chloride of sodium	10·66
Sulphate of lime	8·28
Do. of magnesia	0·84
	100·03

This arrangement of utilising the waste heat of the kiln under the circumstances we have described has almost, if not quite, revolutionised the system of cement manufacture. The proportions of kiln and flue capacity require careful adjustment, for the best advantage can be derived only when they are symmetrical in their measures. Thus it would be unprofitable, and, indeed, inconvenient, were too much kiln-room provided, and thereby require its being lighted when only partially filled. Again, too much flue-space, which would produce more dried slip or slurry than the kiln would contain, would also be a disadvantage. Experience, however, has now arrived at the exact proportion of washing power, flue accommodation, and kiln capacity, so as to prevent the possibility of derangement in the continuous and regular manufacture under the new system. The whole of the processes, too, have another great advantage over the old-fashioned wet system, and that is the immunity from delay or stoppage by unfavourable weather, whether arising from rain or frost. Each kiln has its own carefully-covered and weather-proof flue; and thus, when the contents of the burnt-out kiln are taken away to be ground, the process of refilling may be begun, and so soon as that operation is complete the slurry is speedily allowed to cover the flue floor again for the next charge of the kiln. Under ordinary circumstances the routine of such a process becomes almost mechanical in character and unfluctuating in its conditions, because there is no possibility of intervening error arising to derange its uniformity or accuracy of result.

Securing the unvarying products from the kilns with such regularity permits of adjusting the means of reducing and grinding the clinker, so as to prevent any delay in emptying the kilns, which would practically lead to stoppage of the whole work. The clinker, on its withdrawal from the kilns, is wheeled across to the grinding mills, on the ground floor of which is placed a powerful Blake's stone-crusher, and after being cracked or crushed by its agency, is raised by elevators to the hopper-floors of the cement-grinding millstones, from which it issues in the required condition of fineness. Much difference of opinion at present prevails as to the exact quality of the powdered cement; but to meet the requirements of the most exigent demands, a sifting apparatus is provided, so that almost any degree of fineness can be secured. This, however, involves increased cost, which the advanced or intelligent consumer does not hesitate to meet by paying a higher price for cement so prepared.

The high chimney, so prominent a figure in the view of Messrs. Johnson's cement works, may be considered the leading agent in the industrial efforts we have described. All smoke, from whatever source, is either economically absorbed by its powerful influence or dissipated by its agency, and thus all waste or danger from noxious or dangerous gases is avoided.

In thus hastily describing the various points of interest attaching to the manufacture of Portland cement by the new process, it must not be assumed by our readers that the conversion of such simple materials into so valuable a constructive agent is unattended with anxiety and care. In contrast, however, with the old wet system of manufacture, it may be characterised as simplicity itself, for there are no risks of derangement of mixture when once the true proportions have been combined in the washmill. Neither does the slurry, when it enters the drying flues, encounter any danger of disturbance of its parts, and thus it enters into the finishing stage of the kiln free from any further or damaging influence of any kind whatever. The semi-wet process involves the necessity of a more regular and accurate weighing of the raw materials which, under the old system is generally performed in a haphazard manner by the washmill-men, who are trained up to a belief that on their manipulation, dexterity, and occult astuteness, the whole success of cement-making depends.

It is fortunate for the cement-makers operating within the district covered by our essays that the chalks and clays are so uniform in chemical and mechanical qualities, and, in consequence, the cement manufacturer, and those working under his authority, are saved a great amount of anxiety. It is probably this which has in a great degree hindered progress in cement-making, because the task, at first sight, seems an easy one to mix chalk and clay together, and it was seldom that much more intelligence was forthcoming than such as was capable of performing this simple task. Modern science, however, has thrown light on much that was in the old time obscure, and no rule-of-thumb practice is now tolerated, thereby increasing the comfort and confidence of cement-maker, and cement-consumer.

We ought not to forget a reference to one department of the works at Greenhithe, which may be said, in its reformed shape, to be the unavoidable outcome of much improvement all round, and that is the testing or challenge house. The testing-house is so arranged and controlled that a continuous system of testing the cement produced is daily—if not hourly—performed. The machine used is that invented by Mr. Michele, and is very simple in character, giving as uniform results as are desirable, which are daily recorded, and the briquettes, when fractured, put carefully away, in case they may be required for future reference. The section broken is two and a quarter square inches, being the original size adopted by English engineers from France.

The average breaking-strain of the year 1879 was 1,160lb. per $2\frac{1}{4}$ sq. inch, as stated by Mr. Johnson at the Institution of Civil Engineers.

There are several interesting points in connection with these cement works of Messrs. Johnson outside of their manufacturing value, such as the following.

The chimney is 300ft. above the level of its base, and equal to 350ft. above river level. The base of the chimney is 25ft. square, and at the top it is 11ft. in diameter. It cost £2,500, and its gross weight is 2,500 tons. Five hundred tons of sand were used in its construction. There were 600,000 gault clay bricks used in building it, and the mortar was composed of one of grey lime and three of clear sharp pit-sand, found on the premises. The works, or rather the buildings of the works, cover about an acre of ground only, and it is in this direction that they form a remarkable contrast to works in which the wet process is carried on. The total horse-power now in use is somewhere about 150.

The sum expended in the erection of the works we have described was about £20,000, exclusive of land. The ground belonging to the Company is about 75 acres.

The proprietors of these works provide for the comfort of their workmen, and have a building on the premises in which coffee and other refreshments can be obtained at any time. There is also a reading-room, wherein are a plentiful supply of daily, weekly, and monthly papers, and magazines.

Messrs. Johnson have other cement works pretty nearly conducted on the same system at Cliffe, on the Thames, and Gateshead-on-Tyne.

* * *

CATALOGUE OF PICTURES IN THE DULWICH COLLEGE GALLERY.*

IT would add not a little to the value and instruction of our national art collections if the catalogues were made more worthy of their object by the addition of historical or biographical notices. Some approach to such a course has been made by the series of handbooks published by the South Kensington authorities and one or two other institutions, and the governors of Dulwich College have just brought out a new edition of their catalogue of pictures in the Dulwich College Gallery, which may be taken as an excellent model of the kind of publication we desire. It is descriptive as well as biographical, and contains, in a condensed form, a good deal of information respecting the artists. In the present compilation, the governors have, at the suggestion of the Council of the Royal Academy, secured the services of Dr. Jean Paul Richter, a gentleman of acknowledged learning in art and an accomplished critic, who has rewritten the notices of the Foreign schools. Those of the British School of Artists have been prepared by Mr. Sparkes, the head-master of the National Art Training School, &c. The Dulwich Gallery of pictures has an established reputation. The greater number of the pictures, we find it stated, "were collected before 1807, by the celebrated picture-dealer, Noel Joseph Desenfans, for Stanislaus, King of Poland. They were originally intended for a National Gallery at Warsaw; but the subsequent misfortunes of the King, which ended in the dismemberment of the Polish Kingdom, prevented the furtherance of the design, and after the death of the King, in 1798, the pictures were left in the possession of the collector." Desenfans, at his death, left the whole of them to Sir Peter Francis Bourgeois, a landscape-painter to George III., who, in his will, made in 1810, bequeathed his pictures to the Master and Fellows of Dulwich College, leaving a large sum for their proper care and exhibition. We learn that the gallery was commenced in 1812, the architect being Sir John Soane, and was finished in 1814, when the pictures were removed to it. The catalogue is arranged under the names of the painters found in the gallery, these being in alphabetical order, so that a visitor to the gallery has only to refer to the name on the frame and consult the corresponding name at the head of the catalogue. A table in the appendix gives a list of painters' names, arranged according to the numbers on the pictures, and another table gives a complete list of the painters, with the pictures of doubtful authorship and copies indicated.

It may be worth while to examine a few of the references, and to see on what principles they have been made, and we find on this point a few very useful prefatory remarks have been made by Dr. Jean Richter in a letter to the governors. We quote one remark deserving especial attention. He says: "In examining old pictures it is necessary to take into consideration not only the taste prevailing when they were painted, but also the different principle on which each individual artist worked. We should, besides, have a true conception of his aim and ideas. In no other way is it possible to enjoy intelligently at one and the same time such diverse works as those, for example, of Raphael and Rubens, or of Teniers and Nicholas Poussin. An accurate knowledge of what was intended to be portrayed is especially required in the case of the Dutch painters, who all endeavoured, each in his own way, to represent Nature as she is." Opening the book at the first page we have "Albani—School of Bologna. Born 1578, died 1660." After a short biographical account we find some well-timed and critical remarks upon his style, as, for example, that his "figures display a charming combination of the ideal and sensual," that he represents mostly mythological and religious subjects and the quiet of retired life; that he constantly "used members of his family as models, and held as of great importance the variety of his concetti (motives)." Then we have three pictures in the gallery described as "after Albani," in all of which that painter's manner is recognised in the choice of colours and other characteristics. Each description is further amplified by notes, *e.g.*, references to pictures of a similar kind, where the original is to be found, the subjects or plots selected by the artist, &c. The size and material of the pictures are also noted, and in some cases the former price of the picture. So, in fact, the visitor to Dulwich standing before a picture may obtain its whole history, the characteristics of the school, and the artist's conception; but the catalogue has a more permanent value in affording those in quest of information respecting any great picture or school definite knowledge. Scanning over the 200 pages, we find a very large proportion of pictures belong to the Dutch and Flemish schools. Genuine pictures by Bakhuisen, Both, Brouwer, Cuijp, Van Deelen, Van Dijck, Du Jardin, Janssens, Jordaens, Dusart, Van de Velde, Teniers the elder and younger, Rubens, Ruisdael, Rembrandt, Ommeganck, Van Ostade, Wouwerman, &c. Among them we find several valuable paintings by Van Dijck, the Teniers, Rubens, and Rembrandt. The Italian schools are represented by several works by or after Albani, Raphael, Belucci, Annibale and L. Carracci, Correggio, Cortona, Domenichino, Titian, Veronese. Two or three genuine Murillos are named, also some authenticated pictures by Lorrain, Chardin, Le Brun, N. Poussin, Watteau, Vernet, Le Nain, and others of the French School. English painters are well represented. For instance, we see pictures by Sir W. Beechey, Bourgeois, Gainsborough, Lawrence, Southerbourg, Monamy, Northcote, Opie, Owen, Reynolds, Wilson, and others by unknown artists. The Dulwich Picture Gallery may, in short, be regarded as a very complete and representative collection, and the catalogue really forms a concise handbook to the Old Masters.

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* Catalogue of the Pictures in the Dulwich College Gallery, with Biographical Notices of the Painters. JEAN PAUL RICHTER, Ph.D., and JOHN C. L. SPARKES, Head-master of National Training School, South Kensington. Printed by Spottiswoode and Co.

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ILLUSTRATIONS.

NEW CHURCH, SALCOMBE, DEVON.—RAWDON HOUSE, HERTS.—ST. HILDA'S ABBEY, WHITBY.—HOUSE AT WESTOATE-ON-SEA.—WOODHOUSE, DEVON.—LODGE AND COTTAGES AT HAYDON, NEAR PINNER.

OUR LITHOGRAPHIC ILLUSTRATIONS.

SALCOMBE CHURCH, DEVON.

The nave of Salcombe Church, Devon, was built thirty years since. It is now proposed to put on new roofs, and to add a chancel. The work is to be commenced shortly, under the superintendence of Mr. J. D. Sedding.

ST. HILDA'S ABBEY, WHITBY, YORKSHIRE.

The abbey which we illustrate this week is situate on the crown of a cliff 250ft. above the level of the sea, and commands a magnificent view. It was founded by King Oswy in 664, and Lady Hilda, of high reputed sanctity, was its first abbess. A convent was destroyed by the Danes in 876, and it lay desolate more than 200 years. A Benedictine abbey was erected on its site in the time of William the Conqueror, by William de Percy, and rose from a comparatively humble condition to one of splendour, between the years 1142 and 1316. On the 14th December, 1539, the monks resigned their monastery into the hands of Henry VIII. The abbey is now in ruin, but enough remains to show that it was once very fine and extensive.—A. P. G.

In the Building News for October 29, 1869, was published a detailed account of the abbey, with perspective of interior of north transept, both by Mr. E. H. Smales. Sections of mouldings by the late Mr. Edmund Sharpe, M.A., were given in our issue for August 25, 1871; a view of east end of choir sketched by "W. C.," May 4, 1877, and a drawing by Mr. J. Langham of exterior of north transept, June 28, 1878.

RAWDON HOUSE, HODDESDEN, &c.

Among the architectural exhibits this year at the Royal Academy are the four accompanying drawings, by Ernest George and Peto, Argyle-street, W. Rawdon House, Hoddesden, is an interesting old building, bearing the date 1622; to this the architects have been adding a wing for Mr. Henry Ricardo, the owner. The choice of material had to be made in adding to a building that had been ruthlessly stuccoed. On peeling off the cement from the old work, interesting brick mouldings and pilasters were exposed; and great care has since been taken in bringing again to light the red-brick walls which fixed the character of the new work. The house stands back some 70ft. from the high road. It was decided to add the additional rooms in a wing between the house and the road, forming a courtyard in front, with a gateway to the stables, and covering the site of a recent badly-built extension, which was out of character with the old house. The new wing contains a dining-room, schoolroom, nurseries and bedrooms, and a lift from the offices, and other such conveniences, of which the old house was innocent. The billiard-room is oak panelled, after the manner of the original rooms. A sundial makes a pleasing feature on the south front of the new wing, and the new and old work blend harmoniously. The new building and works to old front have been very satisfactorily carried out by Mr. Hunt, of Hoddesdon, at a cost of between four and five thousand pounds. Mr. J. B. Gass, of Bolton, has had charge of the works, and has shown great care in their superintendence.

A House at Westgate-on-Sea is another work by the same architects, and is now erecting for Mr. Herbert Peto. The house is situated with a fine view of the cliffs and sea, in one of the healthiest positions of this healthiest of seaside places. The plan is compact and square, though the squareness is lost on the ground-floor by the large bay windows towards the sea, and the roof is rendered interesting with picturesque gables. The rooms are grouped round a panelled hall, with a fireplace and deeply-recessed windows. The dining-room has an ingle nook, lined inside with gauged brickwork, and has settles on either side. The long range of windows at the top light a good playroom and schoolroom for the children. The stables are at a short distance from the house. The buildings are of red brick, with weather tiling, and the gables are filled in with plaster modelling by Mr. Walter Smith, of Lambeth; the brickwork is built in cement, and the external walls are hollow, with Jennings' borders, as no solid wall would keep out the sea-damp. The house is being erected by Messrs. Peto Brothers, at a cost of about £3,000.

Wood-house, for Sir George Baker, Bart., is now building at Uplyme, Devon, near Lyme Regis. It is beautifully placed on rising ground, in one of the loveliest coombes of this part of Devonshire, with a fine view over the Lyme Bay, and is situated near Rousdon, a large work just completed for Sir Henry Peek by the same architects. The ground-story of the building is of random-coursed Uplyme stone, built hollow, with brick lining. The upper portion of the building is of timber, boarded and felted over and covered with weather-tiling. The gables are of oak timber work. The contract was taken in competition by Mr. Luscombe, of Exeter, for the sum of £4,525.

The Lodge, near Pinner, for Mr. Lawrence Baker, is built on the site of the former one that was frequently inundated by the rising of the Pinn. The present Lodge is built upon arches, under which the water may rise without doing mischief. The posts of the porch have been cleverly carved by Mr. Hitch. The ornamental plaster filling-in of the timber work is from the hands of Walter Smith. This Lodge, and the group of three cottages, have been built by Mr. J. Kindell, of Harrow.

THE ORDNANCE SURVEY.

Periodical complaints are made of the backwardness and delay of the Ordnance Survey Department, and a debate in the House of Commons the other day drew attention to the unsatisfactory progress made with the large scale map of the country commenced about 20 years ago, and which is so far from being finished, that it is expected the survey will take another 18 years to complete. Such a piece of information is provoking enough, seeing that all the while those who have been looking forward for an authentic survey have not only to wait but pay, and that, when they get the map it will represent England imperfectly. But what is more aggravating is the knowledge of the fact that the survey, slowly dragging its course is, after all, based on the state of the country so many years ago, that it will not correctly delineate the features and changes that have been made in it at the time of its publication. It is, according to the *Times*, doubtful whether the purchaser will get what he wants any more than he is likely to get now in purchasing an ordnance map as advertised on the 1in. scale, which may only give him, to use the same authority's statement, "his own parish about as correctly as if it had been made in the time of William the Conqueror or Agricola." The 1in. scale map represents England as it was in 1795; it gives many roads and boundaries that have ceased to exist, and is misleading to the stranger. Unfortunately, our popular maps of the country and counties are based on this 1in. ordnance map, and the public have to put up with all the deficiencies in it, though the *Times* rather exaggerates those defects, for it must be remembered that popular maps are generally considerable reductions, and it would be mechanically impossible to show any but the larger features such as the lines of railway upon them. We feel there are, however, some grounds for these complaints, notwithstanding the defence set up by the Ordnance authorities, that it is difficult to obtain skilled engravers and other workmen. It appears that, with the power under command, the survey proceeds at the average rate of about five square miles a day, and the daily cost is about £300. If we consider the work is purely mechanical in its nature, this seems a large sum, and there is some plausibility in the assertion that every body of workmen would do their best to protract rather than shorten their work in their own interests. But the efficiency of the map is a greater question. If only the military districts and the larger manufacturing towns have been surveyed on the new scale, and the country districts are delineated as they were 30 years ago, those who live long enough to see the completion of the map will be seriously inconvenienced by its shortcomings. The history of the Ordnance Survey throws some light upon the delays that have arisen. It may be mentioned the idea of a Government survey originated from military exercises. As long ago as the establishment of peace with America, a triangulation was began between this country and France, and this was the commencement of the 1in. map. About 1815, the military interest in it ceased, and private surveyors were employed to carry on what was desired—a good map of the country; but the want of a uniform system of triangulation, the overlapping caused by selecting different meridians, led to confusion, and to a complete revision of the maps. Afterwards, Col. Colby, who took charge of the department, was engaged to make a tenement survey of Ireland, and a 6in. scale was decided upon, which led in time to a reconsideration of the scales. In 1851, a select Committee, and afterwards a Royal Commission, were appointed to discuss the subject. But in 1862 a report was issued, which pronounced in favour of the 25in. scale, which was adopted for the cultivated districts, with the 6in. for the uncultivated; but the battle of the scales continued to go on until Sir Henry James, the late Director, we believe, re-established the present system. Besides the scales we have named, there is a 5ft. scale for towns, and a 10ft. scale, making in all five scales. By a report made by the late Gen. Cameron, it appears the northern counties and a large part of the south of England are finished on the 25in. and 6in. scale, while the British Isles are nearly, if not quite, completed on the 1in. scale. Such are the main facts we have been able to collect. No doubt, there have been many practical difficulties in the conduct of such a survey; the time wasted in the discussion of scales, over which £30,000 had been spent, has been a serious hindrance; but the public should have some assurance when the survey will be completed. The filling-in work, such as the details of buildings and fences within the large triangles, is a work of time, but of the utmost use to engineers and surveyors. The time taken to transfer these details and their reduction by photography is a tedious process about which the public know little, and care less, but they have a right to expect a thoroughly reliable map within a reasonable period.

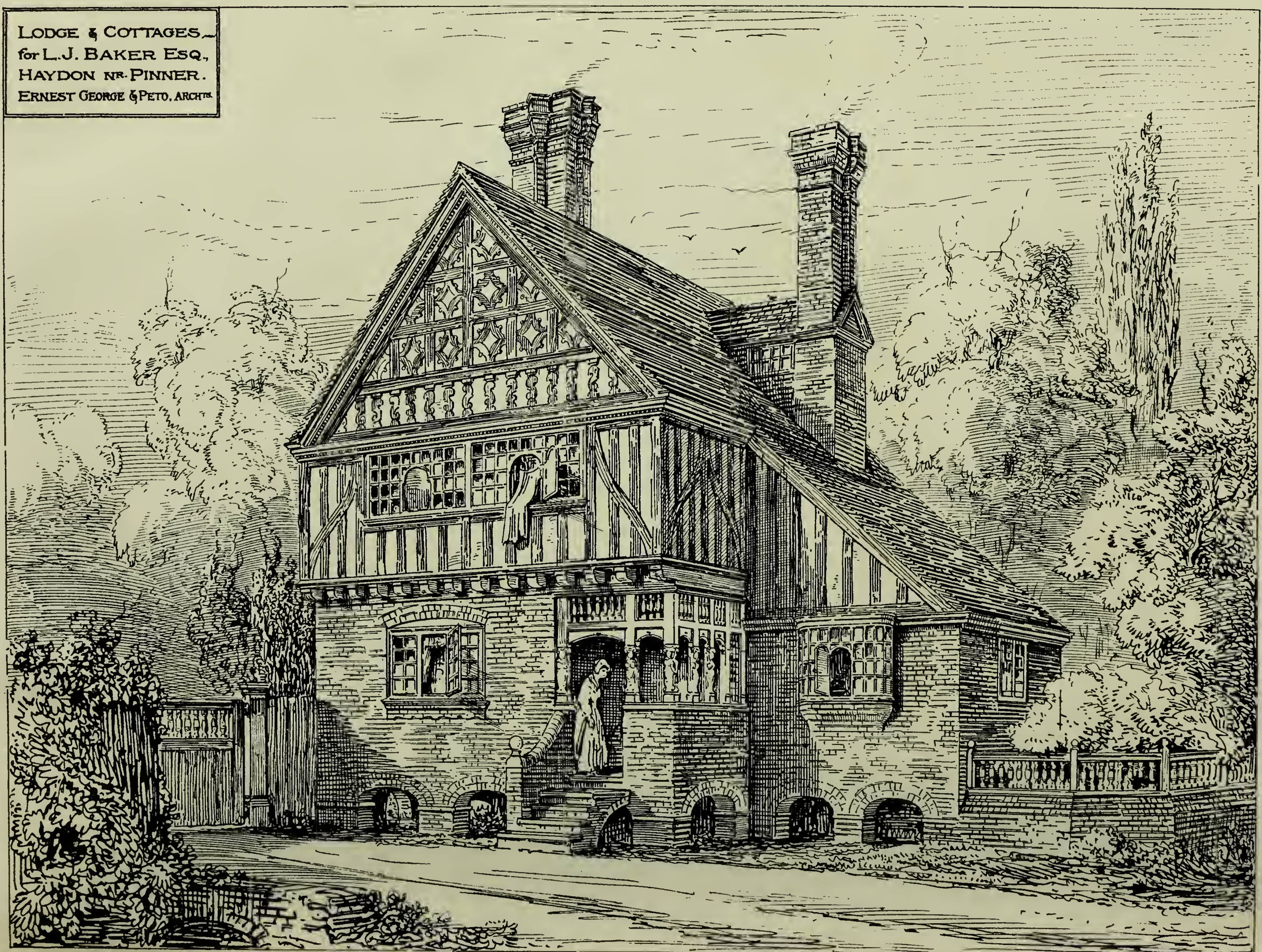
CHIPS.

At the last meeting of the Ely Diocesan Conference the following grants were made:—New church at Biggleswade, £100; restoration of nave at Coxle, £25; rebuilding tower at Higham Gobion, £10; erection of parsonage house at Stopsley, by Luton, £50; Toddington parsonage, £50. A grant for the restoration of Hatley Cockayne was subsequently withdrawn, as the patron promised to take the whole cost of work upon himself.

Old Chingford Church, on the borders of Epping Forest, was reopened for public service on Sunday week, after being closed for 86 years.

At a meeting of the Teignmouth local board, held last week, Messrs. Rowell and Son were appointed architects for the proposed new buildings.

A large block of four residences is to be erected at Truro by Messrs. Farley and Tippet, builders, from plans by Mr. Hicks, architect. The buildings are to faced with Plymouth limestone, with granite for dressings from St. Stephen's.



LODGE & COTTAGES, for L. J. BAKER ESQ, HAYDON NR. PINNER.

ERNEST GEORGE & PETO, ARCHTS.

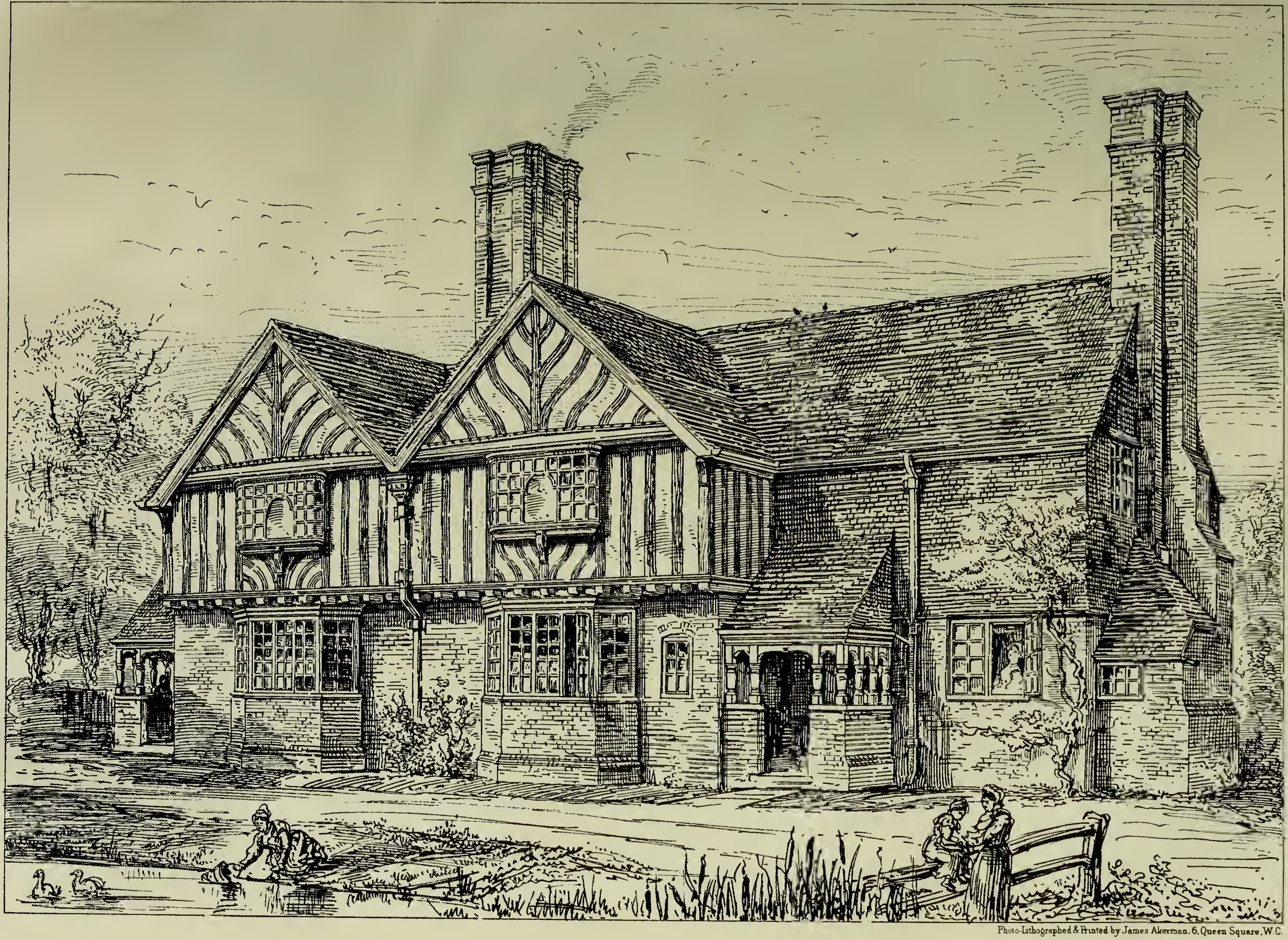
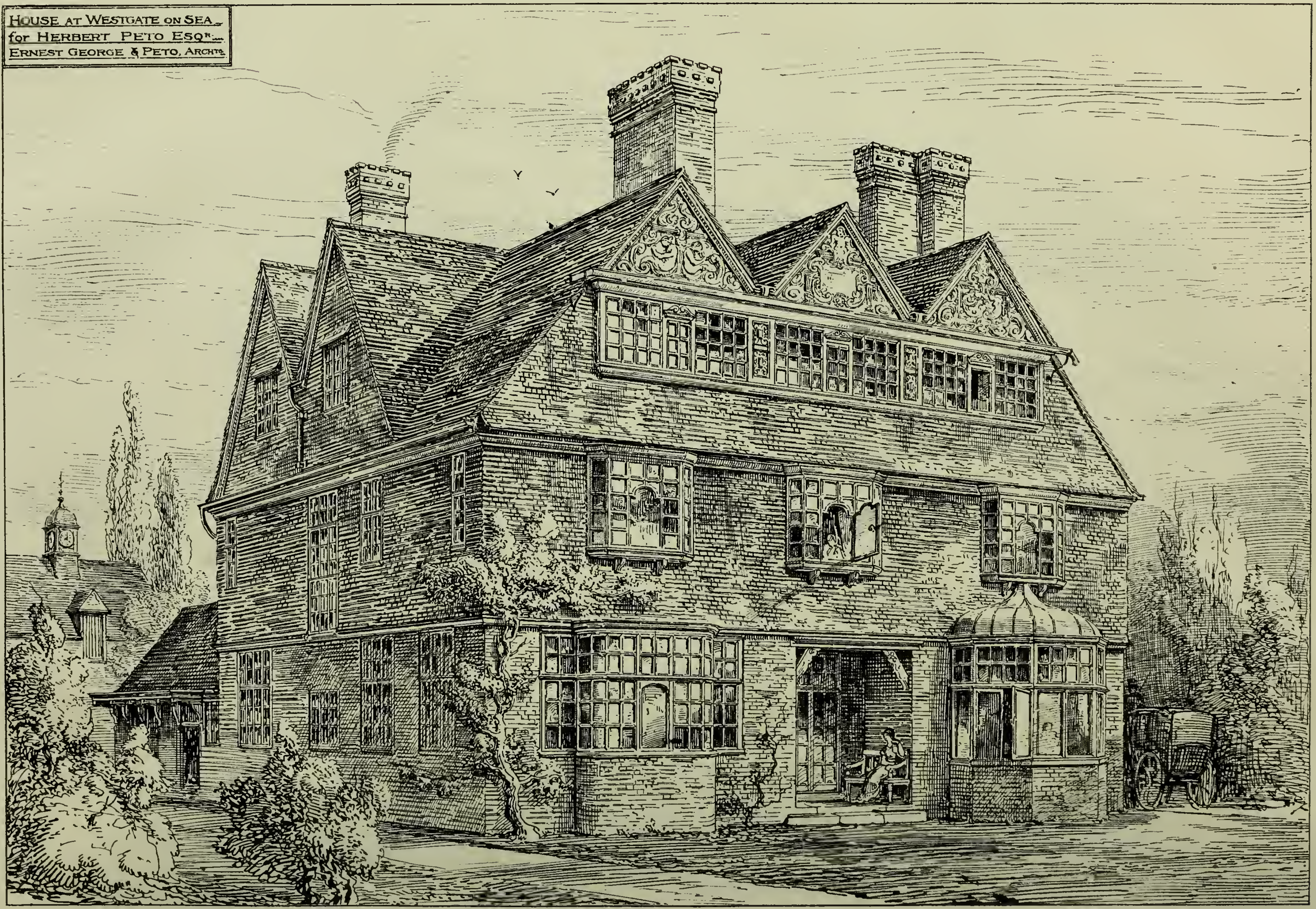
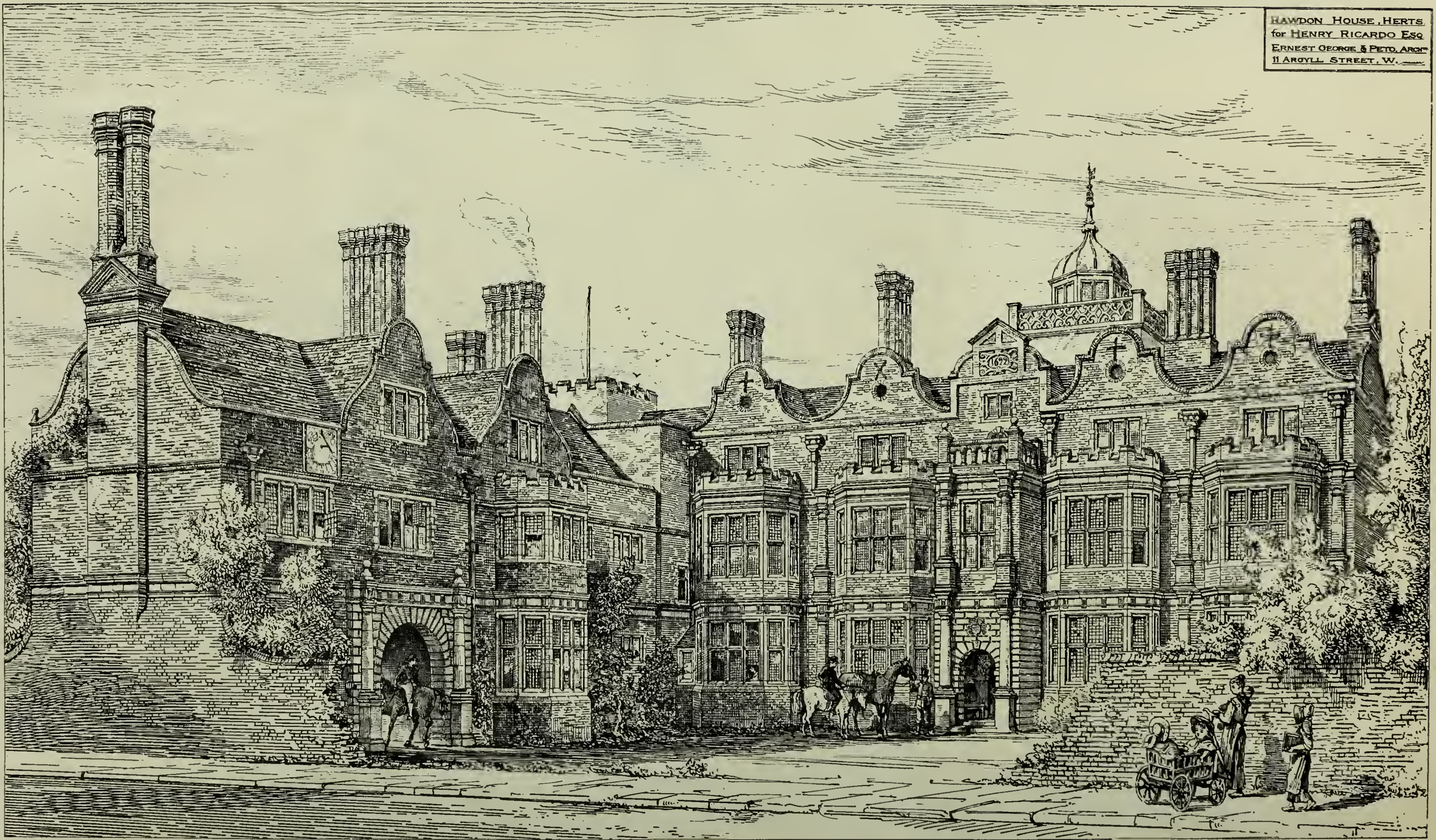


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



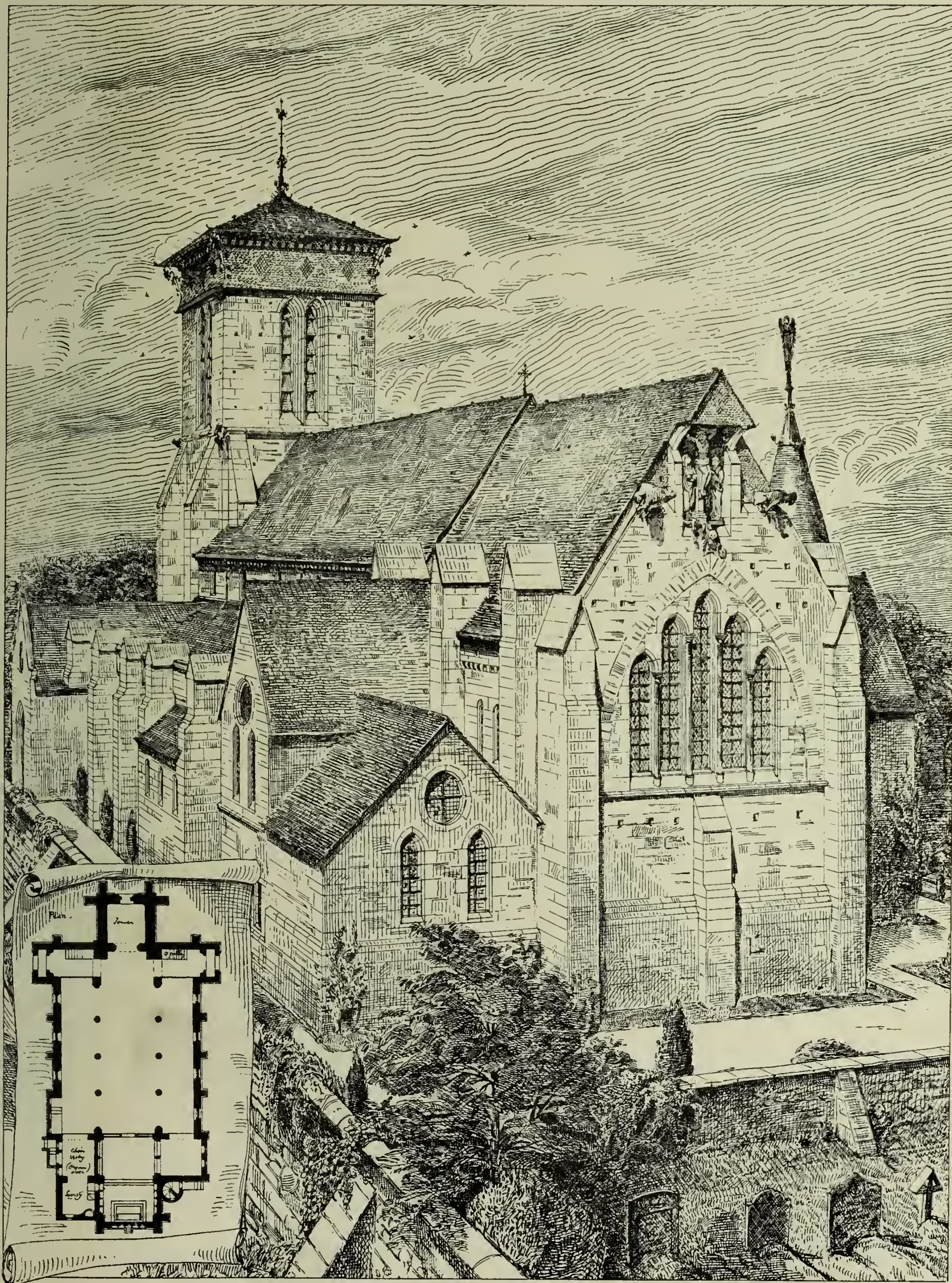
HOUSE AT WESTGATE ON SEA
for HERBERT PETO ESQR.
ERNEST GEORGE & PETO, ARCHTS.

Photo Lithographed & Printed by James Akerman. 6, Queen Square. W C



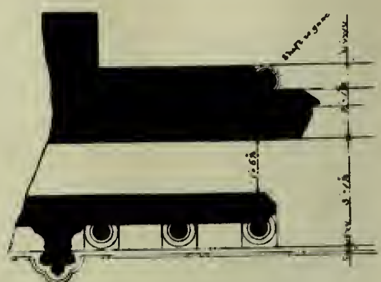
HAWDON HOUSE, HERTS.
for HENRY RICARDO Esq.
ERNEST GEORGE & PETO, ARCHts
11 ARGYLL STREET, W.

Photo Lithographed & Printed by James Akerman. 6. Queen Square. W.C.

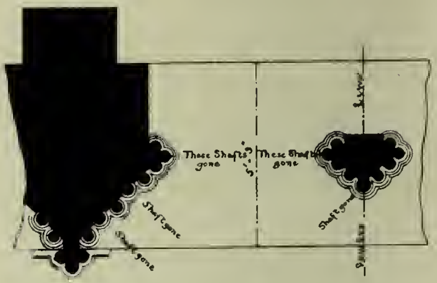


New·Church·Salcombe·Devon·

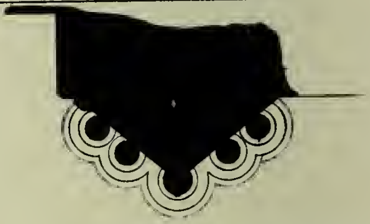
J.D. Sedding Archt.



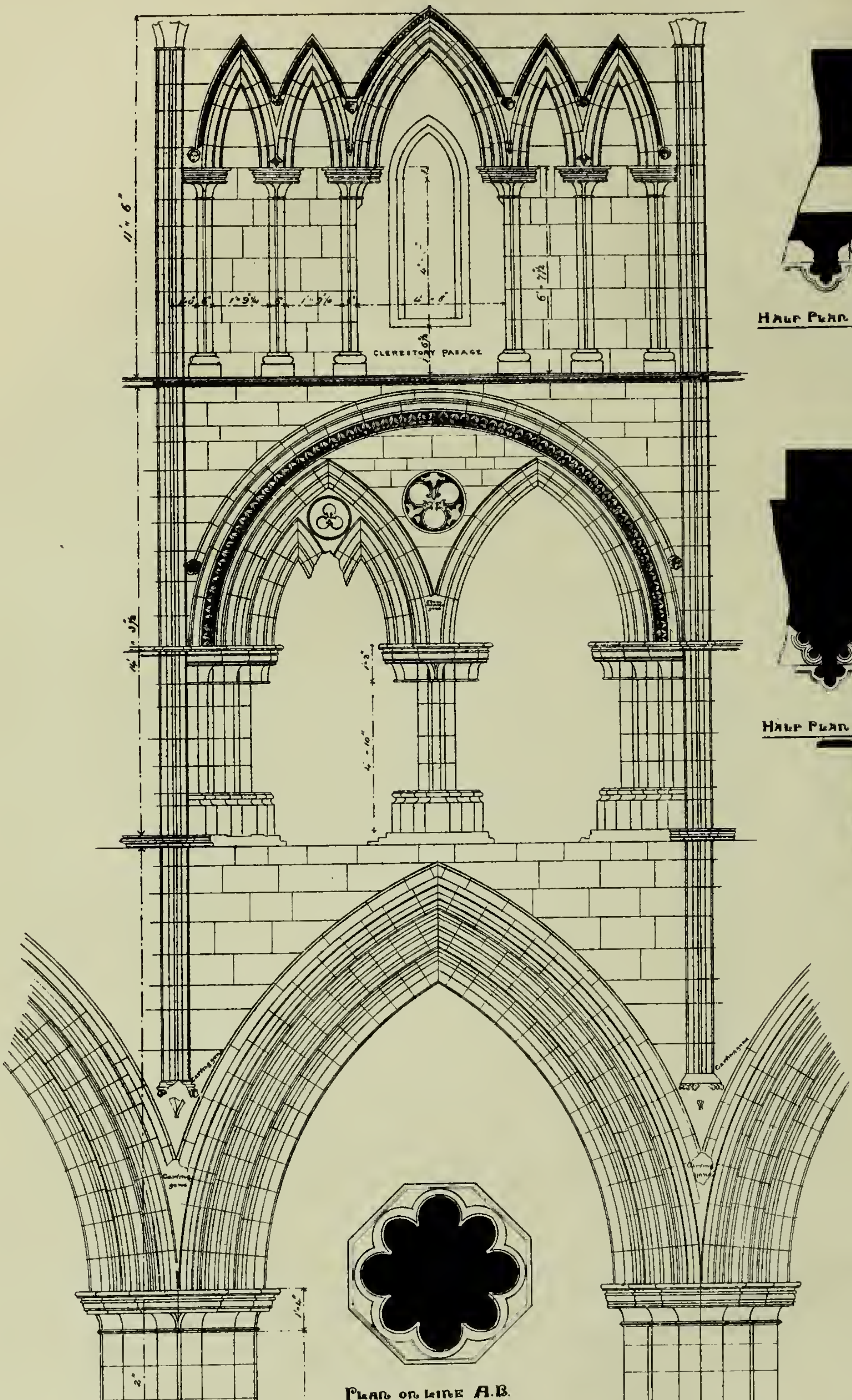
HALF PLAN OF CLERESTORY WINDOWS



HALF PLAN OF TRIFORIUM WINDOWS

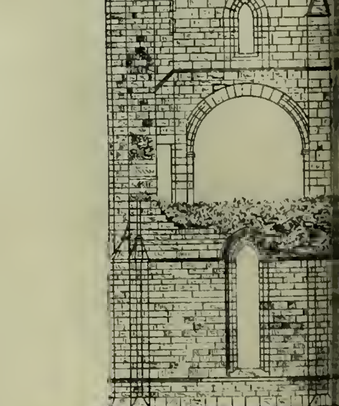


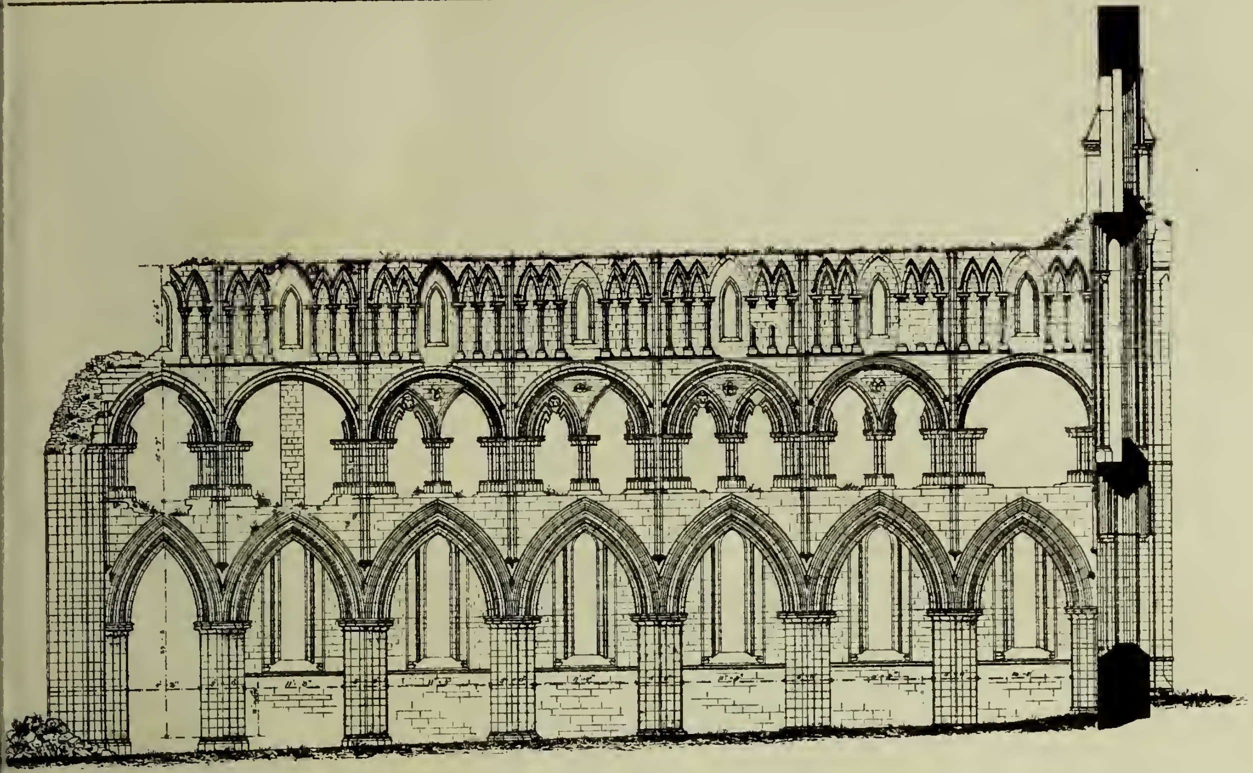
PLAN OF COLUMNS AT EAST END OF CHANCEL



PLAN ON LINE A.B.

ELEVATION OF BAYS ON NORTH OF CHOIR


Mouldings to this window are gone

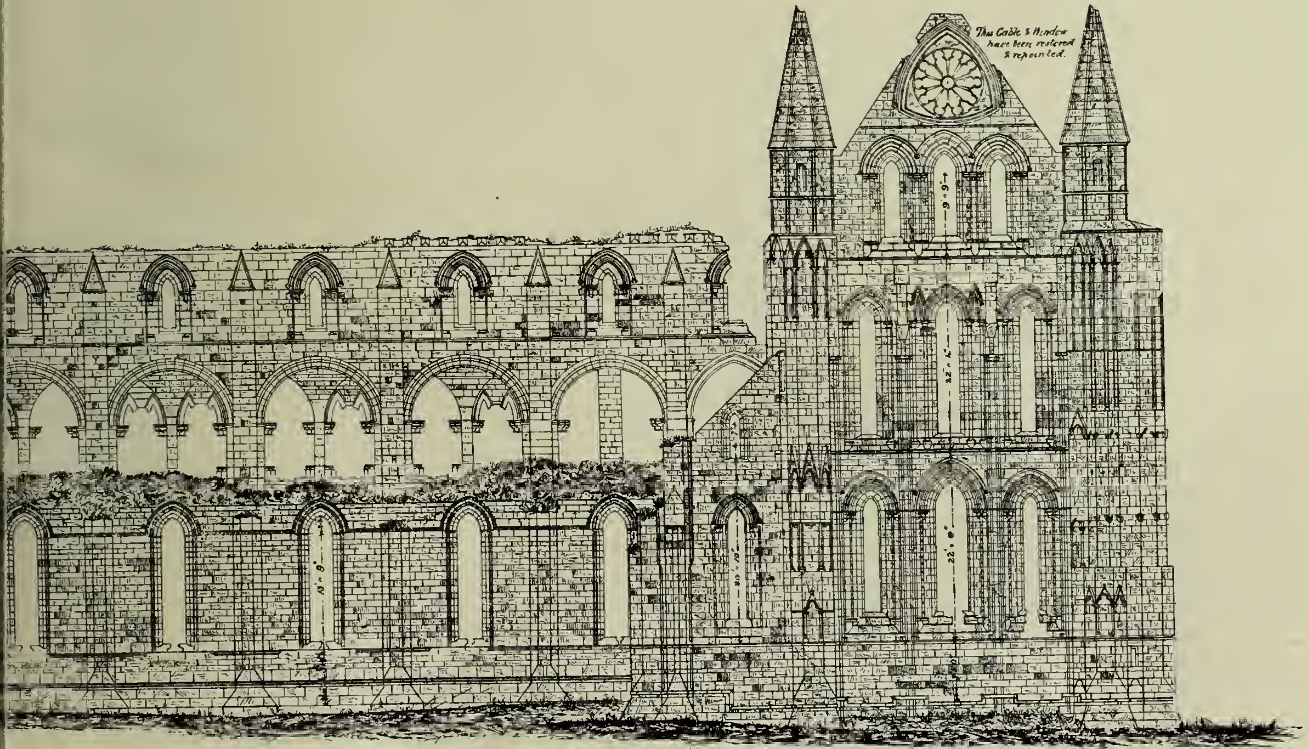


— LONGITUDINAL SECTION — LOOKING NORTH —

SCALE OF [illegible] FEET

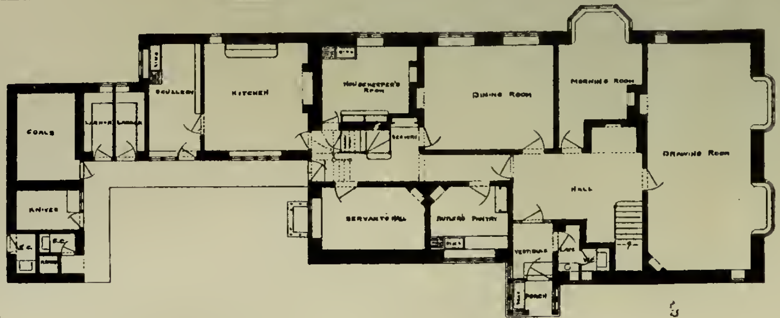
Measured in August
(Drawn in November } 1879
Arthur P. Johnston

ST. HILDAS ABBEY
WHITBY YORKS

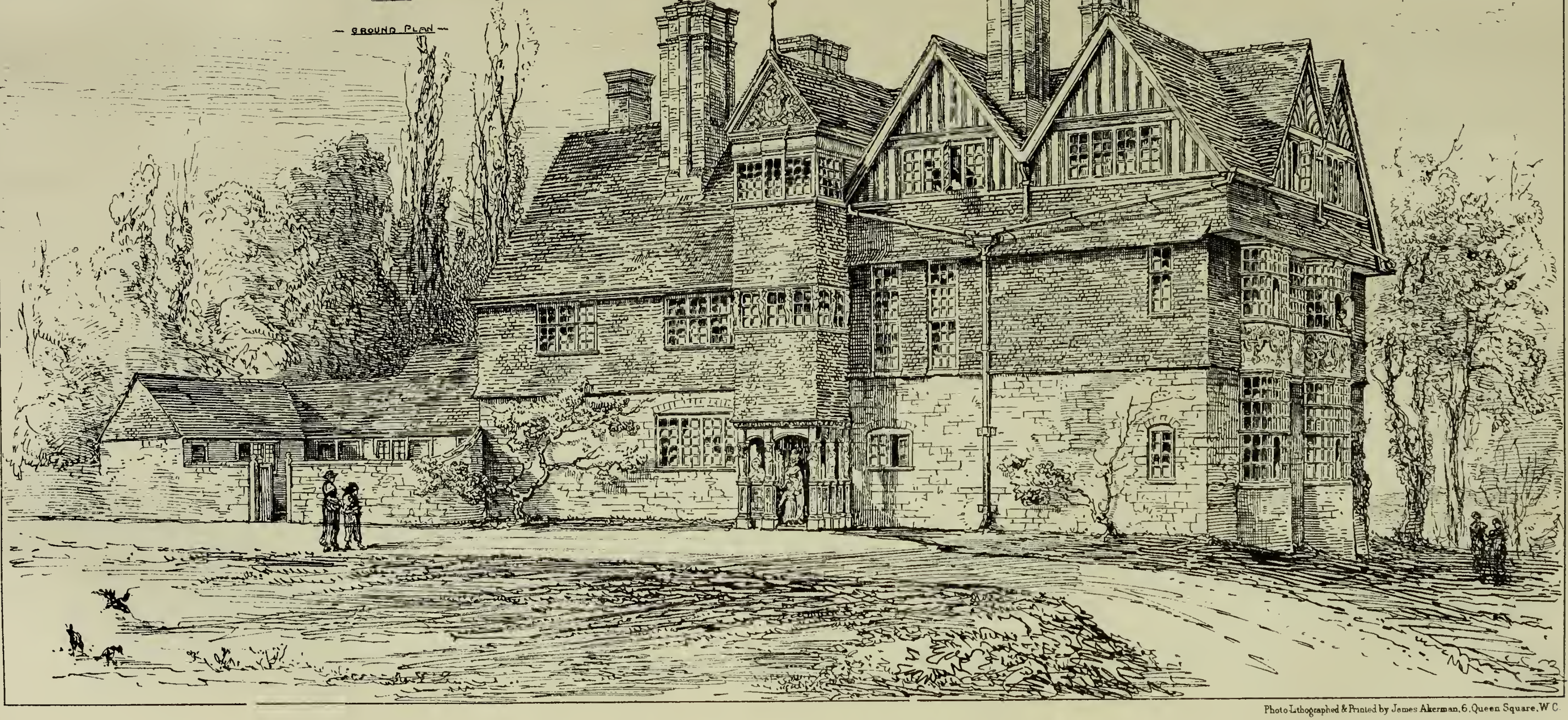


— NORTH ELEVATION —

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



— GROUND PLAN —



WOODHOUSE, DEVON.,
for SIR GEORGE BAKER, Bart.
ERNEST GEORGE & PETO, ARCHTS.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

OUR COMMONPLACE COLUMN.

MUSEUM.

WITHOUT discussing the strict definition of this word, applied by the ancients to a temple of the Muses, and which means a study, or place of retirement, we shall devote our attention to the requirements of buildings erected for the purpose of museums. There are obviously different kinds of museums—first, those set apart for the study of natural history, such as the British Museum, and especially the new buildings, by Mr. A. Waterhouse, called the Natural History Museum, at South Kensington, which may be taken as an excellent model on a large scale (see illustration, Building News, Vol. XXXVI., p. 170); secondly, those set apart for the illustration of a special branch of science, as the Museum of Economic Geology, Jermyn-street; third, those devoted to the collections of works of art and antiquities, as the South Kensington Museum; and fourth, the exhibition of books and manuscripts, objects of manufacture, and appliances, &c. Very often these different purposes are combined in one building, as we find in most of our provincial museums, in which case different principles of arrangement have to be consulted. We may, however, just state a few general conditions which are important for the architect to consider; and the first that occurs is that the *plan* should be arranged strictly in reference to a proper *distribution* and *classification* of the objects to be displayed. By this means the building may be made to assist the student. For instance, in an art museum, the distribution of the several galleries or rooms should be so managed as to allow of a proper system of classification, whether it be based on chronology or style; a museum for the collection of geological specimens, or natural history, should be arranged with reference to some scientific relation existing between the specimens. Thus, for geological museums, the groups of rocks in order of time may be made the principle of classification, or for practical purposes, the igneous and sedimentary rocks may be separately provided for. In ordinary museums both systems might be presented, though the classification generally adopted is that of stromatology, in which the rocks are arranged in chronological order with their fossils. Thus the specimens would have to be classified according to the primary, secondary, and tertiary epochs, and cases would be provided for each group of rocks, such as the Cambrian or the Carboniferous, the Oolitic, or the Cretaceous; and finally, the later specimens of the Eocene and Pleistocene strata. In natural history museums in general, the architect ought to consider the best method of distributing his rooms so that the groups and classes may be exhibited according to some distinction or scientific order. Hence the division into organised and unorganised specimens, seems to be important. In small museums the cases may be made to stand at intervals projecting into the room, each recess or compartment representing a class, order, or genus, in which the species would be collected. We throw out the above suggestions of classification as they may be of value to the designer of museums; but in most instances it is desirable that he should consult with the keeper of some museum, or inspect a few buildings of acknowledged merit in their arrangements. For local museums, the natural history and antiquities of the district ought to be provided for, containing specimens of its geological strata, its *flora* and *fauna*, &c. A good central hall is important, and might be made advantageous for the display of typical specimens, as adopted by Mr. Waterhouse in the planning of the Natural History Museum, where the central entrânce block running transversely with the façade is devoted to the purpose of an index or typical museum. Birds and palæontological specimens occupy the long front galleries on the ground-floor, and from these lead a series of galleries at right angles, for shells, reptiles, and fish on one side, and geology on the other. Alternating between these last-named galleries are narrower ones intended for the use of students. A private corridor is also provided for the use of curators, which traverses the galleries at each end, and which provide communication quite distinct from the public. The main galleries for birds and palæontology and the index museum are arranged with cases projecting from the side walls, lighted by windows between. The British collection is located at the end of the typical or index museum. The second condition of importance is the determination of the area of each department, which, after the general scheme of distribution, must be decided upon in preparing the plan. When the limits of the collection already exist, the architect has some data to work from, and the number and area of the rooms are readily found; but in most cases the building is intended to provide for a growing collection of a multifarious kind—loans, gifts, &c., and it then becomes necessary to have a sufficient number of galleries more or less alike. In such a case the best plan is for the architect to consult the requirements of a general museum, apportioning his area between the departments of natural history in its various branches, art, and antiquities, scientific appliances, and manufacturing processes, which he can generally do with some approximation to the actual requirements. It will be some assistance to him if he tentatively sketches to scale one room with its cases or cabinets, allowing a sufficient width for central corridor, after arranging the fittings; as this will then become, when properly digested, a *unit* as it were, of his general plan, bearing in mind the kind of objects to be shown, lighting by roof, or otherwise. The dimensions of the objects will, of course, give the architect an idea of the area necessary and the height to be obtained; a fair height may be stated to be 14ft. Other points to consider are the strength of the floors to carry great weights, lighting, warming. As regards the size of cases, 18in. is considered a good width, so that a gallery should allow 3ft. for two rows; separate wall cases, of uniform length, are desirable, as they can be readily shifted or removed, and 4ft. may be taken as a good length. The arrangement and construction of museums has been a subject of controversy among authorities. A series of top-lighted galleries, cases having air-tight fronts, and specimens accessible only by intermediate private galleries for students and curators, has been proposed. These private galleries should be in communication, and have cases for duplicate speciments, and be accessible from workshops and professors' rooms. In the Natural History Museum, at Kensington, this arrangement has been carried out, as we have hinted, and narrow reserve galleries are introduced between the wide public galleries. Cases placed back to back and made to project into the gallery between the windows will enable a large number of specimens to be exhibited; besides which, the recesses are convenient for students. Ichthyological specimens have to be preserved in spirits; hence, the room containing them should be fireproof. The mode of lighting a museum should receive attention before any plan is determined on. For museums of natural history collections vertical or top light should be secured, though specimens illustrating mineralogy, conchology, &c., may be better lighted by side openings. Sculpture or pictures are best seen under a top light, or a side light from the north. The museum and picture-gallery at Berlin, by Schinkel, is formed round three sides of a central vestibule; the rooms are about 40ft. wide and 26ft. high, with flat ceilings, and the lighting is by common windows on the side down to the dado. Screens 16ft. high and 20ft. long divide the galleries into rooms, about 30ft. by 18ft., for grouping the pictures. At the Hôtel des Monnaies, Paris, the collection of minerals forms a circle, which incloses a lecture theatre. We may mention the public museum and library at Havre, by M. L. Fortuné Brunet Debaines, described in Gwilt's "Encyclopædia." "It consists of a central hall for sculpture; on either side, and separated from it by an open arcade, by means of which the hall is lighted, is a gallery and a museum, the floor of which is 6ft. or 8ft. above the floor of the hall, so as to afford room for attendants, &c., beneath." A picture-gallery is provided over the hall, and a library over side galleries. The plan is square, about 100ft. Top light may be judiciously obtained in the cove of the ceiling. It is essential to bear in mind the law of reflection of light, so that the angles of incidence and reflection should not be allowed to interfere with the inspection of the glass cases, by avoiding the reflection of the windows and skylights—a source of great trouble and inconvenience in some museums. Side lights will be suitable in small museums, and may be made to alternate between cases projecting at intervals into the room.

For examples of museums we may refer the reader to the index of this journal, and to the illustrations we have given of buildings of this class. The British Museum, the Natural History Museum, Kensington, which we have described and illustrated; the South Kensington Museum, Museum of Economic Geology, Jermyn-street; Soane's Museum, Lincoln's-inn-fields; afford good instances of classified collections, though we can hardly recommend some of them as models. Papworth, in his "Museums, Libraries, and Picture Galleries" (1853), observes: "It is submitted as a constant result of experience that a museum for a provincial town should not be without a lecture-room; its utility at the Museum of Economic Geology is self-evident, and the noble apartments of the British Museum would amply suffice for this purpose; but the utility of a theatre is perhaps greater in proportion where attached to a small collection, than when part of a large one, because the best means of ensuring the permanent and successful establishment of a museum appears to be the employment of some system of lecturing." We may name, among large provincial museums, the Ashmolean and University, Oxford, the Fitzwilliam, Cambridge, and those of Edinburgh, Dublin, &c. G. H. G.

MUSIC-HALL.

Rooms for musical entertainment were originally called "saloons" in London. Canterbury Hall, Lambeth, was the first music-hall opened, which took place in May, 1852. The "Architectural Dict." says, "For the Handel Commemoration Festival at the Crystal Palace in 1859, the company published a plate of comparative dimensions of the principal orchestras of the country, giving the areas but not the sizes. The centre transept was considered as 360ft. long by 216ft. wide; the orchestra being enlarged to 216ft. wide and 100ft. in depth in the centre to hold nearly 4,000 performers." The company published sections of roofs of various music-halls used for musical festivals, but gave no dimensions. It is stated the Birmingham Town Hall is one of the very best buildings for music in this country. We give the dimensions of a few large music-halls in the provinces:—

	Long.	Wide.	High.
Birmingham Music-hall	111·6ft.	76ft.	70ft.
(Two galleries)			
Aberdeen New Music-hall ..	150	68	50
Liverpool Philharmonic Hall	135	102	68
Concert-room, St. George's Hall, Liverpool (1,100)....	77	72	37 oval
Bradford, St. George's Hall	152	76	70
In London:—			
St. James's Hall	139	59	59 6in.
Exeter Hall (3,000)	138	76	54
Willis's Rooms	100	40	
Albert Hall (8,000)	320	308 elliptical	

We refer the reader to an article in the Building News upon the code of regulations issued by the Metropolitan Board of Works for the better construction of music-halls, page 528, Vol. XXXVI., where it is provided that the area to be assigned for each person shall not be less than 1ft. 8in. by 1ft. 6in. in the galleries, nor less than 2ft 4in. by 1ft. 8in. in the other parts of the house, room, &c. It is also required that every staircase for use of audience shall be inclosed by brick walls, and all staircases and floors to be made of fire-resisting materials. No staircase or internal corridor to be less than 4ft. 6in. wide, and wider when the number exceeds 400, and separate exits are to be provided for those parts of the audience which are seated at a higher level than others communicating directly with the street.

NARTHEX.

This term has hardly been defined with exactness: it has been applied to a porch or portico in front of a basilica, as well as to the inclosed court at the west end of an Early Christian church. Bingham in his "Origines Eccles." refers to Eusebius, who uses the term "exonarthex" as looking into the atrium, and was in fact one of the cloisters or porticoes surrounding the enclosure, while the interior narthex ("esonarthex") was a part of the building inclosed by barriers. The terms "narthex" and "porticus" are thus confounded. The exonarthex was a lean-to till the 5th century. The narthex contained three doors, the centre one for the clergy, the north for the women, and the south for the men. At S. Frond at Perigueux, at Fountains and Beaulieu abbeys, there are narthexes. At Cluny (13th century) the narthex was a church with aisles, triforium, and two towers. In large basilicas there was a narthex at each end of the atrium or forecourt. The narthex on the outside was intended for the use of penitents, called weepers, and the inner narthex for another class of penitents, the hearers. (See Walcott's Sacred Archæology, "Arch. Dict.")

THE ENGLISH HOMESTEAD.

THE altered conditions of social life, says Mr. E. Ingress Bell, in the *Magazine of Art*, and the growth of luxuries amongst all classes have had the most disastrous effect on our English farmhouses, and have especially wrought sad havoc with their picturesque interiors. The great fireplace, with its blazing hearth, its cosy nooks, and high-backed "settles," is now little more than a tradition. Its place is filled by a lustrous grate, and the hearth is a patch of encaustic tiling. The great oak beams and their depending trellis have disappeared from the ceiling, which is newly plastered, and has a huge sprawling arrangement of acanthus leaves in the centre. The dear old wainscoting which gave the parlour (now the drawing-room) such a homely charm, glorious in colour from age and "elbow polish," has been removed and cut up into "Queen Anne" mantels in Wardour-street, or used by the architect in the alterations at "the Hall." The farmer's wife and daughter, nothing loth, have substituted for it a garish wall-paper, "harsh and crude," and the surroundings have, of course, been rearranged in corresponding "taste."

We may be sure that the stone mullions and the quarries have been taken out of the old Tudor windows to be supplanted by sashes and vaste expanses of plate-glass, thus destroying at a stroke the scale of the building. The exposed fronts of the house have been covered with stucco, lined to look like ashlar—if that were possible—to the loss of the old weather-stained hanging-tiles, so much more grateful to the eye and, for that matter, equally weather-proof. Perhaps the whole side of the house has been blackened over with tar. It is well if the new tightly-fitting joinery has not made the chimneys smoke, and that the massive old Tudor chimney-stacks have not in their ruddy old age been subjected to the degradation of rows of "tallboys."

The above is, alas! no fancy picture. Even while I write, this kind of alteration, or rather destruction, is going on all over the kingdom. I could cite but too many instances. Not fifty miles from town an old manor-house—long occupied as a farm-house—is being divided up into labourers' tenements. The old "house-place" or "keeping-room," with its tile floor, ample chimney-nook, and dark wainscoted walls, is, or was, a study for a painter. Two long three-light mullioned windows ranged on one side of the room admitted a softened southern light through a screen of tender vine-leaves. Seats below the window-sills, cut out of the thickness of the sturdy walls, formed most inviting resting-places after the "busie labour" of the day. The details, furniture, appointments were all in keeping, and all of the highest appropriateness and excellence in their simple style. The tenant and his women-folk, however, found it all "dull," and have migrated to the nearest market town. Mrs. Poyser receives her visitors on a gay (tapestry) Brussels—surrounded by sticky Tottenham Court-road furniture—instead of in that dear old kitchen in the Hall Farm; and you can no longer get a glimpse of pretty Hetty Sorel among her bright pans in the dairy, the guelder-roses peeping at her through the casement. *She* is in Germany "finishing her education."

The commencement of the present century saw the whole country dotted with picturesque homesteads, of which the next generation will scarcely find an example remaining, and will learn only from a stray wood-cut by Birket Foster, what an English farmstead was in its prime, and how great and irreparable is its loss.

There is no need to enlarge in these pages on the artistic value of the old English farm-house and its surroundings. The saddest example which may still be found is the manor-house in reduced circumstances. Once the residence of the lord, it has fallen successively into the hands of the farmer tenant, and has now probably gone to ruin, or has been divided into labourers' tenements. With every stage of its declension some calamity has befallen it from the artist's point of view, until its old age ends in mere neglect and squalor—a stray chimney-stack of exquisite detail and proportion, a coat-of-arms in a curiously-carved panel, a Tudor porch, or solitary mullioned window being alone left to testify to the charms of its youth. The imagination reverts to the time when it stood out proudly from its entourage of tall elms or noble walnut-trees, its long lines of capacious barns and clusters of golden stacks, its rows of quaint gables and dormers, and the solid or fantastic forms of the chimneys standing boldly up against the sky; the charm of the scene heightened by the drowsy cooing of the pigeons and the measured thud of the busy flail at the open barn. But, above all, the wealth of lovely colour distinguished the older buildings from their newer rivals beyond all other marks. The glowing mellow red of the old bricks and tiles, softened and harmonised by a powder of ashy-grey lichen, the intensely-brilliant green of the mossy patches, and the bright gold of the stonecrop, blended and varied by Nature's own hand, are beauties which are known and dear to all.

Our modern efforts at farm-building in the old style cannot be said to be satisfactory. They are too symmetrical. There is a spick and span mechanical look about them which differentiates them at once. The *naïveté* of the old work, which *grew* on the site, is unproducible in this over-sophisticated age, and the more we affect the bygone fashion, the more transparent is the affectation. The best men are not employed in designing works of this class, which are, as a rule, left to the agent and his factotum.

The common artificers of the sixteenth and seventeenth century seemed to do the right thing intuitively, and so have been guided by an inborn appreciation of what was artistically appropriate to every occasion; the works of that day are never disfigured by those uncouth and unfeeling monstrosities which are the mark of the rural builder of the present day. When we shall have completed the series of rectangular concrete boxes, stucco-covered, with square holes for windows, and deficient in everything which can please the eye, our descendants will wonder at the apathy with which we could abandon to decay the work of our forefathers—work which we were so powerless to imitate.

MR. NEWTON ON GREEK ART.

MR. NEWTON'S seventh lecture on Greek art treated of what he styled the Hellenistic Period, comprising the three centuries between the accession of Alexander the Great and the reign of Augustus. The last of the great sculpters of Greece was Lysippos. His statues appear to have been exclusively of bronze. His great celebrity may be partly due to the fact that his name comes down to us associated with that of Alexander the Great, whose portrait he alone among sculptors was allowed by that king to make. Among his works were two colossal statues, one of Zeus (Jupiter), the other of Herakles (Hercules), in the city of Tarentum. An allegorical figure represented Kairos, "Opportunity," with a long forelock, while he was bald behind, in one hand a pair of shears, in the other a pair of scales. At Rhodes he made the Sun God, Helios, in a chariot group. He made statues of Alexander himself and of some of his companions in arms, who fell in the battle of the Graneikos. There are several extant busts or statues of Alexander, none of which, however, can be traced with any certainty to an original by Lysippos. He also made ideal portraits of great men of past generations, of whom no traditionary likeness had been handed down, such as the fabulist Æsop. Among his statues of athletes was a celebrated one, afterwards transported to Rome. This figure was represented scraping himself with a strigil, and was hence called the Apoxyomenos. In the Vatican is a marble statue believed to be a copy of this celebrated work. The Farnese Hercules, which we knew from an inscription on its base to have been the work of Glycon, is also thought to have been derived from an original of Lysippos. Studying the Canon of Polycletos, conjointly with nature, he constructed a new canon of proportions. To him was attributed the saying that Polycletos made men as they were, but that he made men as they ought to be, a saying which had been variously interpreted, and which seemed to point to some deviation from the normal type of the human figure as established by Polycletos, designed, perhaps, to correct the optical impression produced by statues on a colossal scale. If we turned from this meagre account left by the ancients of the art of Lysippos to extant monuments of his period, we had the lion erected by the Greeks, after the battle of Chæronia, B.C. 336; the sculptured column from the temple of Artemis (Diana) at Ephesus; the Dionysos (Bacchus) from the Choragic monument of Thrasyllos, B.C. 320; and a colossal figure of Victory on the prow of a ship, found in the island of Samothrace some years ago, and now in the Louvre. Professor Conze, in his recent work on Samothrace, had given a restoration of this statue, and pointed out its striking resemblance to the Victory on a prow on the coins of Demetrios Poliarcetes. It was highly probable that this type on the coin and the statue found at Samothrace both commemorated the great naval victory Demetrios gained at Salamis B.C. 305. It was after the siege of Rhodes by this same Demetrios that the Rhodians erected that colossal bronze statue of the Sun God, which, from its immense scale, ranked as one of the seven wonders of the world. Pliny told us that it was 100ft. high, and that few men could with both arms reach round its thumb. It was probably finished B.C. 284, and was thrown down by an earthquake 56 years after its erection. Its position at the entrance of a harbour at Rhodes is marked by some enormous blocks of stone near the fort of St. Nicholas. The tendancy of art in the Hellenistic period was mainly towards the colossal and the sensational, but there was also a strong realistic tendency, shown in the portrait busts and heads of that period, and in what is told us about Lysistratos, the brother of Lysippos, who is said to have cast a man's face from the life, and then worked that up into a perfect likeness. The realistic tendency shows itself strongly also in the Pergamos school of sculpture which was created by the Attalid dynasty. The statue commonly called the "Dying Gladiator" and the group in the Villa Ludovisi called Arria and Pætus were probably part of a great composition representing the victories of Attalus and Eumenes II. over the Gauls. A smaller set of figures, representing groups of Gaulish and Greek combatants, had been identified by Professor Brunn as copies of a set of sculptures dedicated by Attalus at Athens to commemorate his triumph over the Gauls. The group at Naples commonly called the Farnese Bull represented the tragic incident of the punishment of Dirce by Zethos and Amphion, and was, in spite of much restoration, a noble composition deserving of more notice than it had received. It was probably the original work which Pliny states to have been the work of two artists of Tralles and to have been brought from Rhodes to Rome. The great work of the Rhodian school was the Laocoön. There was good reason to believe that we possessed the original group known to Pliny, the sculptures in high relief recently obtained by the Germans at Pergames, and now to be seen in the museum at Berlin, were certainly works of the same school as the Laocoön, and were remarkable from their dramatic and almost modern character. After delivering the lecture Mr. Newton pointed out in the Slade school casts of several of the more celebrated statues of the later Hellenistic period, and made critical remarks on their motive and style.

THE WATER COMPANIES AND THE NEW VALUATIONS.

THE Hackney District Board of Works have been considering a report presented by their Parliamentary Committee, which recommended that a petition should be presented to Parliament, praying that, pending the present Parliamentary inquiry, the Metropolitan Water Companies should be restrained from raising the present rates, and be thus prevented from taking an undue advantage of the new or quinquennial valuation of property. A long discussion arose upon this recommendation, in the course of which it was advocated, on the ground that the action requested would have a salutary effect in restraining a possible arbitrary exercise of the powers already held by the water companies, and in protecting the ratepayers against a premature increase of charge, as based upon increased assessments, before these came into operation. On the other hand, it was argued that the prayer of the petition in effect sought that Parliament should set at nought the acknowledged basis of the water charges, which was legally and properly that of the assessments of property; that the public might rest satisfied with the present temper of the Government, which, it was alleged, was not over-friendly to the water companies, and with the vigilance of the learned counsel who were engaged to watch the interests of the public during the Parliamentary inquiry, and that the proposed restraint involved a temporary suspension of the companies, and a virtual confiscation of their rights, which no one had a right to demand or enforce. Some of the members of the Board preferred giving the Government the still wider scope of considering the whole basis of adjustment of charge; and Mr. Runtz, the Hackney member of the Metropolitan Board of Works, expressed the opinion that it was not likely, whilst it might justly be considered impertinent to suggest, that the Government would override Acts of Parliament regulating the water charges, which, however, the proposal now offered really involved. Ultimately, the Board rejected the Committee's recommendation, 11 voting in its favour, and 17 against it.

CHIPS.

At a special meeting of the governors of the infirmary at Worthing held on Monday, a draught conveyance of land in Lyndhurst-road, selected as the site for the new building, was approved, and it resolved to appoint Mr. Wm. Oldham Chambers, of Lowestoft, architect for the new infirmary and dispensary, and the committee of management were directed to invite open tenders for the execution of the work, and submit the same to the governors.

The new Church of St. Mary, South Hylton, was consecrated by the Bishop of Durham on Monday. It replaces a church on the same site destroyed by fire in 1878, and is Early English in style; it consists of nave 71ft. by 25ft. internally; chancel, 29ft. by 20ft. 6in.; chapel, north side of nave, 20ft. by 12ft., and vestry and organ-chamber on north side of chancel. Mr. Hunter, of Sunderland, was the contractor; Mr. Preston, of the same town, took the sub-contract for slating, and Mr. Henry Tomkinson that for heating.

The foundation-stone of a new church was laid at Ton Ystrad, in the Rhondda Valley, on Thursday, the 17th inst. The church will be Gothic in character, and have a spire 100ft. in height. It will seat between 500 and 600 persons, and, with the vicarage adjoining, will cost £5,000. Mr. Fowler, of Brecon, is the architect, and Mr. C. Sheppard, of Cardiff, the contractor.

A new U. P. Church was opened in High-street, Galashiels, on Thursday, the 17th ult. It seats 200 persons more than the church which previously occupied the same site, and has connected with it a hall accommodating 150 persons, a session house, and side room. Mr. Carl Ludwig, of Galashiels, was the architect, and the contractors were Messrs. A. Murray and Sons, of the same burgh.

New Board Schools are about to be erected at Parson's Green for the South Leith-Landward School Board, from the designs of Mr. James Goolen, architect, of Leith. The building will consist of a main structure two stories in height, with side-wings each of one story, and of a caretaker's house. Accommodation is provided for 300 scholars in three departments, and the contract has been taken by Mr. J. Melrose, of Leith, at £2,800.

The vestry of St. Mary, Newington, S.E., last week raised the salary of Mr. Long, who has been inspector of nuisances since 1869, from £150 to £175 per annum.

A Wesleyan chapel and schoolroom is to be erected at Lostwithiel, at a cost of £1,500, from plans by Mr. Hicks, architect, Redruth, the contractors being Messrs. Philp and Brown, of Lostwithiel.

Messrs. Peutre and Cossentine are the contractors for building a Wesleyan chapel at Polruan-by-Fowey, at an estimated cost of £1,000. The architect is Mr. Hicks, of Redruth.

A new organ was opened on the 24th June in the parish-church of Lamerton, near Tavistock, the old instrument having been destroyed in the fire which gutted the church two years since. The organ was built by Messrs. J. W. Walker and Sons, of London, and cost £340; the case is of oak, and the pipes, which present a double front, are decorated in colour.

A new church, in the Early English style, built of Kentish rag, and seating 400 people, has just been erected on the outskirts of Lamorbey Park, near Bexley, and was consecrated last week by the Archbishop of Canterbury.

Building Intelligence.

Cheltenham.—A new horse repository for Mr. W. Baker was opened on Friday. The principal frontage is to Regent-street, the buildings being grouped around a large quadrangle. Fronting Regent-street are the offices and harness-rooms, and on one side a covered ride measuring 150ft. by 33ft. in height, lighted both from the side and by lantern openings in a pitch-pine roof. A second side is formed by the coach-house, 76ft. by 22ft. with granary over, having shoots and lifts. The fourth side is occupied by four ranges of horse-boxes, fitted up in a substantial manner in oak and pitch-pine, and with special systems of ventilation and flushing. In the centre of this front is a loft 95ft. by 30ft., and 16ft. high, having upon it a clock-tower, with a clock presented to Mr. Baker by his patrons at a cost of £200. There are also washing, sweating, and drying-rooms, and a domicile for resident overlooker. Messrs. Billings, of Cheltenham, were the contractors, and the architect was Mr. C. M. Miller.

Great Paxton.—The parish-church of Holy Trinity, Great Paxton, Hunts, was reopened on Sunday week, after complete restoration, effected at a cost of about £1,500. Those portions of the fabric supported by arches of nave, and the north transept date from the middle of the 11th century; the south transept and part of chancel from the 13th century, and the remainder of chancel and tower from the 15th century. The chancel-roof has been rebuilt, the east window remodelled, and the sedilia, credence and piscina restored by the Ecclesiastical Commissioners, and carved oak choir-stalls, pulpit, and lectern have also been placed in the building. The roofs of nave and aisles have been almost entirely relieved. The Norman north transept arch and the chancel and tower arches, hitherto blocked up with rough plaster, lath and plaster, and boarding, have been opened out. The tracery of the windows has been repaired, and the porch re-roofed. The floors have been reduced to their original levels, which are curiously various; this part of the work has brought to light the carving at the base of the massive stone columns in the nave, where the floor has been lowered no less than 2ft. 6in. A new vestry has been built, and the floors throughout the church have been relaid with red and black Staffordshire tiles. Porritt's heating-apparatus has been introduced. The altar is now covered with a crimson and gold cloth, worked by the Misses Towgood. The architect was Mr. E. T. Streatfield, of Great Marlborough-street, London, W., and the contractor Mr. William Osborne, of St. Neots, Hunts, who has restored upwards of a score churches in this district.

Liverpool.—A fresh start has been made with the Union Presbyterian Church, Liverpool, the foundation-stone of which was laid in 1876. The new plans have been prepared by Mr. David Walker, architect, of Liverpool, at an estimated cost of about £4,000, the contract having been undertaken by Mr. John Wylie, builder. The plans consisted of a wide nave divided by iron columns into aisles, the total internal dimensions being 73ft. in length by 58ft. in width. On the north-west front a tower, with saddle-back roof and open lucerne lights at bell stage, rises to a height of 90ft.; and on the south side an octagonal-ended staircase flanks the main gable, which is to be filled with two large three-light windows. The nave will seat 678, and the south gallery 204 worshippers, with provision for extension to an additional 200 sitters by the erection of side galleries, if required. A large lecture-room, with retiring-rooms attached, capable of holding 500 people, will be erected over the ground floor classrooms, in the rear, the roof being open to the ridge. The style of the building is Early Pointed Geometric Gothic, the materials with which the structure is to be built being entirely of bricks, faced with deep red bricks, and moulded bricks for all the doors, windows, and other features.

Llanbadwr.—Llanbadwr Church, Aberystwith, was formally reopened on the 1st July, after the restoration and refurnishing of the tower and transepts at a cost of about £2,500, under Mr. John P. Seddon, architect, of No. 1, Queen Anne's-gate, Westminster. The transepts have been reroofed and ceiled, and the crux groined in wood beneath the belfry-stage. The pulpit, which is the gift of the Bishop as a memorial, is of freestone, and has bas-reliefs of St. Paul and St. John, by Mr. Hugh Stannus. The restoration has been executed by Messrs. Roderick Williams and Son, of Aberystwith. The nave was thoroughly restored some years since, and the chancel is about to be undertaken also, from designs and under the superintendence of Mr. Seddon.

Pendleton.—A new Presbyterian chapel, schools, and house, at Pendleton, Manchester, have been lately completed under the superintendence of Mr. William Dawes, architect, Cooper-street, Manchester. The design is based on the Romanesque style. The walls throughout are constructed with red brick, relieved with stone dressings. The chapel, which accommodates 305 persons on the ground-floor and 258 in the galleries, is 57ft. long, 30ft. 7in. wide, and 32ft. high. In connection with the chapel there is a minister's vestry and conveniences for the use of the congregation, and between the chapel and the schools there are three rooms that may be alternately used as vestries or classrooms. Over these rooms are arranged the organ-chamber and two additional class-rooms. The school-room is 48ft. long, 36ft. wide, and 22ft high. In the basement there are storerooms, tea-room, heating-chamber, &c. The contractors for the work were Messrs. Kewley, Jones, and Robertson. Mr. Joseph Roberts was the clerk of the works. The cost of the buildings was about £5,500.

Restoration in Chester Diocese.—At a Consistory Court for the diocese of Chester, held on the 24th ult., a faculty was granted for the restoration of St. Peter's Church, Stockport, where the works will include the erection of new chancel, replacement of present pews by open benches, reflooring of church, and the addition of spire to tower, the whole outlay being estimated at £3,523. A faculty was also granted for Frodsham parish-church, where it is proposed to re-roof the building, remove galleries, throw open the tower and restore its pinnacles, restore the north and south arcades, reseat the church with benches, except in the Helsby Chapel, where chairs will be placed; to construct new vestry, pulpit, reading-desk, and heating apparatus. A new reredos was also sanctioned in the church of St. Chad, Romiley, near Stockport, and a stained-glass window in Astbury parish-church.

Skipton.—A new Primitive Methodist chapel was opened, on the 27th inst., at Sargrave-road, Skipton, Yorks. The chapel is 41ft. by 42ft. inside, and 32ft. from floor to ceiling. A vestibule, 7ft. wide, runs the whole length of front, finishing at each of the flanking towers with gallery stairs. Minister's and steward's vestries, lavatories, &c., are in the rear of chapel. The basement contains a large schoolroom, 42ft. by 35ft., infant school, four classrooms, heating-chamber, caretaker's house, conveniences, &c. The chapel is heated by hot water; accommodation is provided for 700 persons. The cost has been between £3,000 and £4,000; the style of architecture is Italian. The building has been carried out from the designs, and under the superintendence of, Mr. Thomas Howdill, architect, 40, Park-lane, Leeds.

* * *

A Local Government Board inquiry was held at the Town Hall, Ipswich, on Thursday week, before Mr. Robert Morgan, C,E., with reference to an application from the town council for sanction to the borrowing of £4,412 for providing a hospital for infectious diseases. It was explained that the local authority some years since built a temporary fever hospital of wood, which had now fallen out of repair. Tenders had been invited for a permanent structure, and that of Mr. R. S. Smith, of Ipswich, had been accepted at £3,649, the remainder of the sum asked for being for site, fencing, and furniture. It was asked that the loan should be granted out of its turn, as the matter was urgent., The inspector promised to report on the matter and mentioned that the plans had been approved by the board.

At the quarterly meeting of the Bath and Wells Diocesan Societies, held at Wells, on Tuesday week, the following grants were made:—Brampton Ralph, for re-roofing church, £30; Wedmore, for reslating and restoring St. Mary's parish-church, £100; Seaborough, for restoration of parish-church, £40; Weston-super-Mare, new class-room at St. John's Schools, £15; and Paulton, new infants' school, £55.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—Edwin Haaber Jeg, Sub Silentio (It is to be regretted your drawings were not prepaid, as they did not reach us till it was too late. Your drawing of bridge will probably appear), Acorn (too late; your design on the whole is commendable).

Correspondence.

UNDERWRITING DWELLING-HOUSES.

To the Editor of the Building News.

Sir,—The Society of Arts have, during many years ambitiously, if not at all times successfully, entered upon the discussion of important domestic questions which, without intervention, might have slumbered, and never been thought of or considered. Whether such a society, founded on generally speaking popular principles, is competent to deal with vital sanitary questions need not be discussed, but if a body composed of such varied ingredients and of all shades of scientists and philanthropists can, by their influence or persistency, bring such questions as the condition of our dwellings to the front, their labours cannot be said to be in vain.

At the first meeting of the annual Health Conference, Mr. Cresswell pressed upon the consideration of the meeting the expediency of delegating the supervision and control of dwelling-houses to the Metropolitan Board in London and County Boards throughout the country. Under the circumstances attending such a proposal in its initial stage it was impossible to give such details as would indicate the scope and character of such a scheme. To insure houses against the risks of fire or natural elemental violence is now an almost universal system, which, during late years, has assumed the character of an almost firmly-established custom. Insurance companies are entitled to the credit of having initiated the fire-brigades and other cognate appliances for the extinction of fires and saving human life. At first they loaded themselves with much of the cost attending the working of these protection systems, for it was clearly their interest to mitigate the evils surrounding the destruction of property by fire. If the system of fire-proof buildings was carried out to the fullest margin of its protective development, the necessity of insuring against loss by fire would naturally cease. The most hopeful and enthusiastic, however, even do not contemplate an early realisation of such a state of comfort or happiness.

Mr. Cresswell enters on a wide and almost boundless field of protective or rather conservative usefulness in his proposition to grant certificates of healthiness and constructive capacity to the owners of dwelling-houses. We cannot expect to find any appreciable amount of hearty response to such a scheme from those owners where its advantages and guarantees would be most necessary or desirable. The owners of badly-constructed or unsanitary houses would hinder by every means at their command the necessary reparation which their dangerous structures require. In fact, many of the worst and most disgraceful dens of filth and disease are by their very constitution incapable of the most moderate remedies. Such buildings can only be improved by rasing them to the ground.

In the direction of providing against the possibility of danger from new buildings, is, however, a comparatively simple matter, for it is within the capacity of the most indifferent builders to secure their structures against the possibility of their becoming nuisances or dangerous pesthouses in the future. But to insure such a desirable result, the proposed building must not only in its various parts and details of construction be unimpeachable in character and design, but the foundations on which it rests must have careful consideration. The base must not only be solid and strong enough to secure it from settlement or disturbance, but it must also be impervious and proof against the absorption, noxious moisture, or gases from the site on which it stands. Our London suburbs, and, indeed, the suburbs of all industrial and populous centres, expand in the direction of the previously highly-charged manure lands, which have been for many years dedicated to the cultivation of all kinds of vegetables. Houses so placed without any protective means of preventing the rise through their spongy and ill-conditioned walls of *liquid manure*, are unfitted for human habitation. However, many of our London workmen's dwellings are so placed, and to repair or renovate such badly-built structures would be a matter of considerable difficulty, if not impossibility.

Our mercantile marine has the advantage of being guarded by the famous "Lloyd's," and according to the character of its classification, the underwriters belonging to that body insure the vessels at such rates as cover the risk they enter into or underwrite. The means of information, however, at their command, and by which they are guided in the estimation of the risk they run is good, sufficient, and reliable, for every ship is liable, and, in fact, undergoes a survey of a competent Lloyd's surveyor before it can receive its certificate of character of seaworthiness or general capacity to withstand the strain of its intended duty. All materials of its construction, and the style and character of the workmanship, by and through which it is fashioned, receive the most careful and intelligent scrutiny; otherwise it would be excluded from the advantages of insurance, unless at rates so high as would practically amount to prohibition.

The duty of certifying the sanitary and structural condition of a dwelling-house would involve not only an examination of the site upon which it is to be built, but also the most careful and intelligent scrutiny of the materials of which it is intended to be composed. Foundations, walls, timbers, and indeed all detail, would have to be carefully examined, and such tests, both mechanical and chemical, applied as would secure it against the danger of introducing into its construction no materials but such as were of the best. Bricks submitted to compressive tests, and their porosity carefully measured, would insure that no spongy or absorptive walls could be reared, and the danger with which such capacity is associated becomes a matter of impossibility. Mortar, and the cement and sand of which it is composed, and its tensile strength would also have to form an important ingredient in the system of testing, which must surround and be inseparable from the system securing the acquirement of sanitary dwellings.

Lloyd's and its officers have, by long experience, arrived at the most advantageous methods by which they are guided in their by no means careless or indifferent surveys and examination; but it will be difficult, if not impossible, in the present lamentable condition of constructive science, to institute such tests as can secure the object Mr. Cresswell has in view.

Much advance has doubtless been made during recent years in the attainment of sanitary rules for the elimination of the waste incurred in the maintenance and comfort of human life, but the machinery of its enforcement is not of the most reliable character. While the dwelling is provided with the means of securing a supply of gas and water as well as a presumably perfect system of sewage connection with the arterial or main drains, no competent authority exists who can control or regulate the quality of the materials of which the building itself is formed. We have district surveyors, parish surveyor, and all sorts and kinds of well-paid and useless authorities; but when a house tumbles down, or its walls become deranged and dangerous, we find that there is really no responsible officer to whom the public can look to for comfort or support in the hour of danger and necessity.

London with its teeming population and its complicated and extensive machinery of vestrydom, has to look after itself, and some of the buildings now being raised daily within the circle of its supposed protective influence, are simply a disgrace to our modern intelligence. We have had very recently some remarkable disasters—some of the biggest, but happily without the loss of life, and it is almost amusing to see how actively each *responsible* authority disowns his share of the culpability of the transaction or mishap. But, under all circumstances, the builders most vehemently insist that the materials were of the best, and no fault could by any possibility lie at their doors. Bricks were undeniably good, and the mortar superexcellent, when perhaps you might easily crush the one in one hand and be unable, even by microscopic aid, to find any lime in the other, and the sand itself was minus lime, simply road mud or something worse.

Let us begin if we are to start with a system of testing all materials used in building, when the means of securing habitable and healthy dwellings would not be far to reach.—I am, &c.,

A Civil Engineer.

NEW CEMETERY CHAPEL AT TAVISTOCK.

Sir,—The Building News of May 21st and 28th last, contain illustrations of a new cemetery chapel, &c., at Tavistock. The descriptive letterpress accompanying the same appears to be incomplete. Might it not fairly have been stated that at Abbotsbury, in Dorsetshire, there exists an ancient building, viz., St. Catherine's Chapel, with which in size, proportions, and design generally, the said cemetery chapel is almost identical.

For, on comparing these geometrical illustrations given of the one, with geometrical illustrations which I possess of the other, almost the only variations I perceive are that, on plan, the *position* of the octagonal turret is now shown at the S.W., instead of the N.W. angle of the building; different tracery is used in the windows; these also being coupled, instead of single ones, in the end walls; and that a somewhat different version is given of the porches and roof internally.

If such be really the case it will not be difficult to decide how far any merit, or otherwise, which may attach to this new chapel is due to Mr. Henry Clutton, who is termed "the architect" of "these interesting buildings," and how much to the original designer.—I am, &c.,

J. Drayton Wyatt.

PORTLAND CEMENT.

Sir,—I am very glad that my letter has elicited a reply from so able an authority as Mr. Reid; but can hardly accept his solution of the question, and as I am perfectly serious, I must ask you to insert the following in reply:—

(1) There is no doubt that the iron I sent you had been crushed; but I stated that the sample simply contained the larger particles, the rest of the iron being ground so small that it could only be detected with the magnet. We had in stock, when I wrote you, cement from three different makers, all of which contained more or less iron. If all this has been caused by "crushed bolts or nuts," machinery used in the manufacture of cement must be very ill-made and carelessly managed. I am quite aware that iron filings are a costly adulterant to use in cement, and it was because I realised this fact, I wrote you, being unable to frame any rational explanation how such an expensive article came to be mixed with the cement. Had it been an exceptional thing for me to find iron in cement, I should not have troubled you. My experience has been that I have found iron present in quite three out of five samples examined; and when it has been mixed in anything like quantity, I have nearly always found the cement to give a low breaking weight.

(2) If Mr. Reid will take, say, a pint of cement, and well mix with it a teaspoonful of fine rusty filings, he will, unless he has a very acute touch, fail to discover them by handling. The cement gives the iron a greasy feeling, which prevents its presence being so detected. I have at present two cement-testing machines, both of which are described in Mr. Reid's book. I stated in my previous letter that it was from the fact of the cement I was testing failing to stand the tensile strength that I was first led to discover the presence of iron, and, as I have endeavoured carefully to follow Mr. Reid's own directions in his book, which has been my guide in testing, I fail to see how I have "courted" difficulties.

I regret to hear that iron "in even the mildest and least objectionable form in Portland cement is more or less dangerous," as we have such difficulty in obtaining cement free from it, and should like to ask Mr. Reid, in conclusion, if he would reject cement that contained an admixture of iron, or whether he would consider it safe to use it should it stand a breaking weight per 2½ square inches, of, say 750lb., at the end of seven days.—I am, &c.,

June 30th. Magnet.

MEMORIAL TO THE PRESIDENT AND COUNCIL OF THE R.I.B.A.

Sir,—If "A Westminster Architect" had read the memorial with greater attention, he would have seen that it refers only to "*Public* Architectural Competitions," and goes on to say:—

> "Your Memorialists are further of opinion that the necessities of the case call for united action on the part of the profession, and that the most effectual way of ensuring this will be to devise some scheme whereby all members of the profession can agree not to take part in any Public Competition, unless a professional adjudicator of established reputation is appointed; *and to such a condition, if generally accepted*, your Memorialists are prepared to bind themselves."

Further, in the explanatory circular, it is stated: "The accompanying Memorialists," &c., &c.

I understand that the Westminster Vestry-Hall Competition comes under this heading.

A reference to the professional journals would have shown your correspondent that the number of memorialists is 1,274, not 1,474, and should the prayer be granted, I doubt not that a much larger adherence will be the result, as many have waited to see what joint action is to be taken.—I am, &c.,

June 30. Cole A. Adams.

WESTMINSTER VESTRY-HALL.

Sir,—1. I gave my consent to enter this competition before I was asked to sign the memorial referred to by your correspondent, and certainly before I signed it.

2. The signatures to that memorial were specially conditional. I have yet to learn that those conditions have been fulfilled.

3. The terms of this competition were prepared by the Vestry's professional adviser, and are, as far as I can judge, especially just and reasonable; and I believe that gentleman is still advising, and is likely to advise in this matter, and I, for one, have confidence that his advice would be unbiassed and intelligent.

4. This competition is a limited one, and as such I think outside the scope intended by the memorial referred to. I am open to correction as to this.

5. It would be advisable, in the interests of those competitors who have friends and relatives upon the Committee, that those vestrymen should resign their seats on that Committee, as I doubt not that they would act the part of Brutus in so responsible a position; but they might fail to obtain the credit due to so noble, yet unpleasant, an obligation. Considering, however, the number and character of the gentlemen who compose the Committee, I entertain no fear of the judgment being influenced by personal favour.

6 (and lastly). Competitions have disadvantages, as those who enter them well know. I seldom join in them; but, when I do, I make up my mind to accept their result with equanimity, and without grumbling.—I am, &c.,

John P. Seddon.

VERY MODERN EGYPTIAN.

Sir,—They have done it at last. I knew they would. It seems fatuous! They have put a meaningless modern sphinx on the pedestals, one on each side of the Cleopatra Needle; and what, I fancy, most people will think a still more evil chance has befallen the base of the monolith itself. It has been clothed in buskins of make-believe Egyptian design.

Unless the object was to cover it up, I put it to your readers—Could an ancient relic be more vulgarised?—I am, &c. R. C.

MANHOLE COVERS.

Sir,—I am not surprised at the letters which have been called forth by Mr. Rawlinson's condemnation, in the Building News of April 30, of direct ventilation through the perforated lids of manhole covers.

Your correspondent, Mr. Read, city surveyor of Gloucester, in giving a sketch of the cover used by him, might have strengthened his argument by a reference to the model plans recently issued by the Local Government Board as a guide to engineers and sanitary authorities, and bearing Mr. Rawlinson's signature in the usual corner. Sheets 1, 2, and 4 of these each contain drawings of manholes, having covers with grated lids, and without side-chambers, the only difference between those covers and Mr. Read's being in the attachment of the necessary bucket. Sheet 2 shows in addition a manhole with a grated cover in which the bucket attachment is identical with Mr. Read's.

Having invested in these drawings as soon as published, in order to become acquainted with the ideas of the Local Government Board upon sanitary details, it is rather disappointing to find Mr. Rawlinson practically repudiating them before they have been six months in existence.—I am, &c., C. E.

June 22.

ROTHERHAM BATHS COMPETITION.

Sir,—Can any of your readers tell me the result of the above competition? On the 5th May last a "Committee in Council" selected six out of the designs sent in. These were to be on view (to members of the Corporation only) for a fortnight, and then the committee were going to make a selection. Since then I have heard nothing—rather a lengthy fortnight. Considering that the designs have been in since the 25th of March last (over 13 weeks), I think it is high time, and only fair to the respective competitors, that the decision of the committee should be made known without any further delay.—I am, &c.,

An Interested Party.

MISERERE.

Sir,—In your "Commonplace Column" for the current week, passing reference is made to the Early English miserere seats in the choir of Exeter Cathedral. All of them—fifty or more—date from Bishop Bruere's time (1224—44), with one exception, and that of later date. When the restoration of the cathedral took place, a few years since, one stall less than there had been there before was shown in the plan. Why, under those circumstances, the Perpendicular miserere seat, being an odd one and an addition, was not sacrificed (if it was absolutely necessary to sacrifice any at all), instead of one of the Early English series, I never could exactly understand; suffice to record that one of the sharpest and most perfect of Bishop Bruere's misereres was removed.

When last I heard of it, a year or so ago, it was in the stoneyard of the cathedral mason, who also holds the post of Diocesan surveyor. It is to be hoped that this seat will not be allowed to be lost sight of; for Early English woodwork, of any sort, is very seldom met with, and rarer still, sharp, crisp carvings, such as are exhibited in the miserere in question, which, after over 600 years' existence in Exeter's cathedral choir, is turned out—still sound, hard, and without so much as a worm-hole in it—to seek a home in any collector's cupboard who may chance to take an interest in it.

A week or two ago, I was met, at a little Dorsetshire station, not many miles from Sherbourne Abbey, by a jovial country builder, who, after driving me to his place and hospitably entertaining me there, showed me over his belongings. Amongst some odds and ends, were eight old miserere seats in perfect condition, Late Decorated or Early Perpendicular in character: their carvings were remarkably vigorous. I bought them of him for five shillings apiece, all round, and they are before me as I write. Where did they come from?—I am, &c.,

Exeter, June 19. Harry Hems.

ST. MARY'S CHURCH, FRAMPTON.

Sir,—Seeing, but a very short time ago, the Church of St. Mary, Frampton, Lincolnshire, grave fears for the safety of the lovely Transitional tower and spire were forced upon me, and there can be no doubt, I think, that the time has come when measures for their preservation ought to be taken. Ugly fissures, those on the east face being the most serious, give evidence of gradually-increasing mischief. The tower and spire, and portions of the fabric (Decorated) are illustrated in Bowman and Crowther's book; but the drawings convey no idea of the present dilapidations. The church has been described and written of by archæologists and antiquaries, and chronicled by our greatest Gothic instructor as having "the most perfect of all simple Early towers and spires." Trusting steps will be taken to hand down in safety to future generations this noble work of the 12th century,—I am, &c, Safety.

CHIPS.

At a meeting of the congregation of St. James's Church, Wednesbury, held last week, it was decided to complete the chancel as a memorial to the late vicar, in accordance with the designs of Mr. Samuel Loxton.

The districts of High and Low Bentham, near Lancaster, are about to be supplied with water. The scheme has been devised by Mr. Frith, C.E., who estimates the cost at about £3,000.

The name of Mr. David Hughes, a local builder, has just been added to the commission of the peace for Liverpool borough.

A new church of St. Matthew is about to be erected at Preston, from the designs of Mr. James Hibbert, of Church-street, in that town.

The town council of Colchester, at a meeting held on Wednesday, received and considered counsel's opinion as to the recent negotiations with the water company. Messrs. Philbrick, Q.C., and Mr. Millar, Q.C., in a joint report, recommended the council to complete the contract with the company, *i.e.*, to pay the money which they had formally, and under the sanction of an Act of Parliament, covenanted to pay for the property and interests of the water company. After the bargain was struck, there was, it seems, a change in the politics of the majority of the town council, and the new body considered that 25 years' purchase was too high a price for the undertaking. They now, after delay and incurring considerable expense, find the agreement was binding.

Messrs. Hayward and Wooster, of Bath, have taken the contract for the erection of a mansion, with stables, &c., near Box, Wilts, from plans by Mr. Hicks, architect, Redruth.

The memorial-stone of additions about to be made to the council-chamber and assembly-rooms of Chichester was laid by the mayor of that city on Monday. Messrs. Jeffery and Skiller, of Hastings, are the architects; Mr. George Clark is the contractor and Mr. G. C. Inkpen the clerk of works.

The Prince and Princess of Wales opened the bridges of Hammersmith, Putney, and Wandsworth, free from toll, on Saturday afternoon. This completes the freeing of the bridges within the Metropolitan area. Ten bridges have, in all, been thrown open to the public since the passing of the Act in 1877, at a cost of £1,377,325; the original claims amounted to £2,388,095.

Intercommunication.

QUESTIONS.

[6161.]—**Perspective Drawing.**—I shall feel favoured by receiving information as to the best method to draw in curved work, in preparing perspectives, so as to get the lines steady and uniform.—X. Z.

[6162.]—**Hundred Pound Cottages.**—Where can plans be obtained of the Duke of Devonshire's Cottages, to cost £100 each, which gained the Gold Medal from the Royal Agricultural Society (Ireland)? Many of your readers would be glad to know what can be done at such a low cost.—S. W.

[6163.]—**Testing Portland Cement.**—Will the writer of the recent series of articles on Portland Cement add to the value of the one on testing it by giving an easy method of doing it where only small quantities are used, and when, consequently, the expense of a testing-machine would not be incurred? For one case where it is used in such large quantities as to justify this expense it is used in one hundred where it would not.—Salt.

[6164.]—**Damp Walls.**—Which is best? I have a house, the walls of which, in the basement, both outside and inside walls, show a dampness, which rises from the ground line, say, 2ft. or more. My idea to remedy it is to clear out the mortar to joint (just above the ground) through the thickness of brickwork, and work thin lead through, flat and point, and fill in with cement; or, if possible, work the patent felt through the joint instead; or cut out or underpin the walls piece by piece, insert Taylor's patent glazed stoneware anti-damp course, keying-up soundly with tiles or slates and Portland cement.—G. B.

[6165.]—**Sketching in Hotel Cluny, Paris, and Notre Dame Cathedral.**—Can anyone inform me how I can obtain permission to sketch in the above edifices; and also in what part of the city are there any remains of "Old Paris"?—F. J. P.

REPLIES.

[6147.]—**Science and Art Certificates.**—I have noticed with interest the query and answers with regard to the Science and Art Department Certificate for Architecture. Reply 6147, June 18th, says the only architectural examination held by the department is Building Construction, while 6147, June 25th, says that he holds *all three* certificates. Two statements so diametrically opposite, from holders of certificates, I fail to comprehend. Will any of yours kindly inform on the subject?—One not Certificated.

[6156.]—**Decoration of Distemper Ceiling.**—The colour to be used ought to depend on the furniture of the church, the colour of the seats, and, especially, on the light. For the ground of ceiling, a vellum, salmon, or probably a grey tint would be the best. A strong light would allow of a more positive and deeper shade of colour. Chocolate, red, and blue, or buff, are good colours to employ; but so much depends on the church itself, that it is difficult to recommend any particular scheme. If harmony of tints are required, I should suggest simple shades of buffs, browns, or greys, according to the scale of colouring required. Positive colours are best avoided in small churches, unless they can be skilfully combined.—G. H. G.

[6160.]—**Treatise on Light and Shade.**—There is a treatise on Shading, by Gwilt, entitled, "Sciography, with Examples of Shadows," and a very good exposition will be found in Newland's "Carpentry," at the end. The "Treatise on Descriptive Geometry" (Lockwood and Co.) explains the principles of shadow projection. I may refer "A. B. C." to article in Building News, just published, and to Wightwick's "Hints to Young Architects" (Lockwood), for the principles of shading, light and shade.—G. H. G.

CHIPS.

A new vicarage is about to be built at Great Broughton, Cumberland, for the Rev. R. Clarke, from the plans and specifications of Mr. W. C. Jennings, of Cockermouth.

A coffee-tavern was opened at Lydney, on Thursday week. The fittings have been supplied by Messrs. Sessions and Sons, of Gloucester and Cardiff.

The North Oxfordshire Archæological Society had an excursion south of Oxford on Wednesday week. At Marsh Baldon they visited the church, noticing the tower, which changes above the roof of nave from a square into an octagon, and the Georgian pew, singers' gallery, and other fittings. In the grounds attached to the mansion are bases of pillars, arcadings, and other fragments of the former church at Nuneham. Having inspected Toot Baldon and Garsington Churches, the members visited the bishop's palace at Cuddesdon. After inspecting the private chapel and library, and the theological college, the churches of Forest Hill and Stanton St. John were seen.

The east window of the chancel of St. John's Church, Gloucester, has just been filled with stained glass, as a memorial of the Rev. Thomas Stock, who was rector of the parish, and of Mr. Robert Raikes, the joint-founders of Sunday-schools. The window is in the Italian style, and of three lights. The centre opening contains our Lord Blessing Little Children; on the left side is the Nativity, and on the right, the Baptism of Jesus. The window was designed and executed by Messrs. Camm, Bros., of Smethwick, Birmingham.

STATUES, MEMORIALS, &c.

Statue to Robert Raikes.—Earl Shaftesbury will unveil, to-morrow (Saturday), at noon, in the gardens of the Thames Embankment a statue of Robert Raikes, proprietor of the *Gloucester Journal*, by whom the first Sunday-school was established in England in 1780. The site selected faces the first entrance-gate east of Cleopatra's Needle, and the pedestal is of grey Cornwall marble. Upon this is erected a statue of bronze, at present shrouded. The height of statue and pedestal is 20ft.

WATER SUPPLY AND SANITARY MATTERS.

Colchester.—A Local Government Board inquiry was recently held at the Town Hall, Colchester, before Mr. J. T. Harrison, inspector, with regard to the application from the town council for leave to borrow £33,000 for sewerage works. Mr. Clegg, borough surveyor, explained the scheme, which he estimated to cost £35,370, in addition to the purchase of land, of which a minimum of 25 acres would be required for filtration or irrigation. The net loss on the scheme would be £500 a year for working. The sewage will be pumped up on to a tank on the land by two 25 horse-power engines. An alternative scheme, proposed by Mr. Edward Easton, C.E., of Westminster, estimated to cost £30,000, was submitted on behalf of a large landowner.

The Rivers Pollution Prevention Act.—A deputation, representing the mill-owners, woollen manufacturers, paper-makers, calico-printers, dyers, &c., waited, on the 23rd ult., upon Mr. Dodson, the president of the Local Government Board, with respect to the grievances they felt with regard to the carrying out of the above Act. Mr. Trevelyan, in introducing the deputation, said that supposing the provisions of the Act were enforced with increased severity for the next three years, it would almost have the effect of stopping manufacture in Scotland. Mr. Alex. L. Brown, president of the Manufacturers' Corporation, then presented a memorial which set forth the views of the association he represented. Mr. Dodson, in reply, said he had listened to the views of the deputation with a great deal of pleasure, and when the opportunity came he would lay them before the Government. They would understand that, in dealing with a matter of this kind there were first the rights of the private owners to be considered, and then there were the rights of the public to consider from a sanitary point of view, and the Government had to arrive at a just balance between the different interests. It was not improbable that before long the question of the pollution of rivers, and other sanitary questions would have to come under consideration, and he promised the deputation that their views should then have attention. He would, however, be misleading them if he held out any hopes of the Government dealing with the question this session. He could assure them that they had more work than they were likely to dispose of successfully this year.

The Water Supply of the Metropolis.—On Saturday last, an inspection of the works of the Chelsea Water Company was made by the governor, the directors, engineers, secretary, and other officers; and, at the invitation of the board, representatives attended of all the metropolitan water companies. The company now takes its water from the Thames at about half a mile below Sunbury Lock. It has at first to pass through an iron grating at the intake, guarded by a movable wooden screen so arranged as to prevent the accumulation of river *débris* from being drawn through the grating, and is then drawn through two fine wire screens into the covered wells, from which the water is pumped into the regulating tank by two steam-engines, each of 40-horse power. Thence it runs into any one of the four subsidence reservoirs, each of which is capable of holding 35 million gallons; or, if necessary, the water can be delivered into the 36in. main and sent direct from the intake on to the filters at Seething Wells, a distance of five miles. From the reservoirs the water flows by gravitation through a 36in. main to the filter beds at Seething Wells. The beds are seven in number, and have an area of about seven acres. The filtering medium consists of coarse ballast, coarse and fine gravel, and a top layer of sand of about 3ft. in thickness, the total depth of materials being 8ft. From the filter beds the water runs into the filtered water tanks, and thence into the engine wells, from which it is pumped up to the service reservoirs on Putney-heath, a distance of over four miles. There are six steam pumping engines of 150 horse-power each, working in pairs. Four of them are sufficient to raise ten million gallons per day of 24 hours into the service reservoirs, which are capable of holding 11 million gallons. They are 180ft. above the level of the engine wells at Kingston. From these reservoirs the water flows by gravitation through four mains to Putney, where they pass over the river to Fulham. Thence they are branched off at various points into the service pipes, through which the domestic supply of the whole district is afforded. The subsidence reservoirs, covering about 40 acres, at West Moulsey were first visited, and subsequently the inspecting party proceeded down the river to inspect the filter beds and pumping machinery at Seething Wells.

LEGAL INTELLIGENCE.

Arsenic in Wall-Papers.—Steinhoff v. Woollams.—This was a case tried at Guildhall, June 17, 1880, in the High Court of Justice, Queen's Bench Division, before Mr. Justice Bowen and a Common Jury, in which the plaintiffs, Messrs. Steinhoff, sued the defendants, Messrs. Wm. Woollams and Co., wall-paper manufacturers, of High-street, Manchester-square, W., for certain sums said to be due for colours supplied to the latter. Defendants refused payment, on the ground that the colours were verbally guaranteed by the plaintiff's agent as non-arsenical, whereas one of them, called "Imitation Azure Blue," did, in fact, contain a large quantity of arsenic. Previously to discovering this fact, defendants had used the pigment in the manufacture of wall-papers, and, as it has been a strict rule with them for years past to allow no arsenical colours to be used in their factory, they were thrown between the alternatives of endangering their reputation by the sale of goods detrimental to the public health, or of having the stock of arsenical paper they had unwittingly manufactured left on their hands. They chose the latter course, and now made a counter claim on the plaintiffs for £370, for compensation for the loss incurred. The plaintiffs were represented by Mr. Lord; the defendants by Mr. Kemp, Q.C., and Mr. Plumptre. Mr. Frederic Aumonier proved that he was now sole proprietor of the business of the defendants, and traded under the style of Wm. Woollams and Co.; that his firm had dealt with the plaintiffs for non-arsenical colours continuously since 1862; that the plaintiff's traveller (Mr. Cobbe) guaranteed the "Imitation Azure Blue" to be free from arsenic at the time the first order was given for it; that it was bought and used on the faith of Mr. Cobbe's assurance that it was free from arsenic; that he continued to use it until his attention was called to the fact that one of his papers contained arsenic; that he then had all the colours used in his manufactory tested by a competent analytical chemist, when it was found that the "Imitation Azure Blue" was the only one that contained any arsenic; that he at once discontinued the use of the said blue, and withdrew from sale all the stock contaminated by it, to the value of £370, or thereabouts; that he had in Court samples of all the papers spoilt; and that he had a number of his workmen in Court who were prepared to prove in detail the employment of the arsenical blue in staining all the papers complained of; that he had had all his colours tested by Dr. Bartlett, Mr. Bernard Dyer, and Mr. R. E. Alison, competent analytical chemists; and that he was otherwise prejudiced by the expense he had been put to in the examination of his stock. Mr. Bernard Dyer, analytical chemist, proved that he had tested the "Imitation Azure Blue" by various processes, and found it contained over 50 per cent. of arsenic. He had also tested several papers coloured with it. Mr. Lord, for the plaintiff, did not desire his learned friend to call any further scientific evidence. Mr. Charles Barton Cobbe, traveller to the plaintiff, denied most positively that he had guaranteed the "Imitation Azure Blue" to be free from arsenic. Mr. Wm. Muir, partner with the plaintiff, said Mr. Cobbe had no authority to guarantee. Letters from the plaintiff to the defendants, dated 1873, were produced, stating that all the colours and flocks supplied by plaintiff to defendants were free from arsenic. Mr. Lord contended for the plaintiff that since the defendants took the trouble to obtain in 1873 a written assurance that certain colours were free from arsenic, it was fair to assume that if they desired the same guarantee about a new colour in 1878 they would make a point of getting it in writing also. Mr. Kemp replied for the defence, and pointed out that in the position that Mr. Aumonier occupied, representing a firm of established reputation for the supply of non-arsenical papers, it was impossible to believe that he would buy colours without an assurance that they were free from arsenic; that if his client were not telling the truth he must be committing deliberate perjury, as he could not be mistaken on such a matter, while, on the other hand, Mr. Cobbe might easily be mistaken. His lordship summed up, and, after directing the jury that any statement intended to be a warranty made at the time of sale was a warranty in law, and that if Mr. Cobbe, although not authorised in words, was, by his position in the plaintiffs' service, authorised in their opinion to do all things needful to sell the colours, and that he did guarantee the colour to be free from arsenic, his employer would be bound by what he said, left it to the jury to say whether the colour was sold free from arsenic by the plaintiffs' agent, and whether he was authorised to give a warranty. The jury found for the defendants, Messrs. Woollams, on both points, and a verdict was entered accordingly, the amount of damages to be settled by arbitration.

"JERRY" BUILDING EXTRAORDINARY—HEAVY PENALTIES.—On Monday last, at the Edmonton Petty Sessions, Mr. W. R. A. Cole, of High-road, South Tottenham, was charged, upon four summonses, with infringing the by-laws of the Edmonton Local Board of Health, inasmuch as he was erecting four houses in Town-road, within the district of the Board, the walls of which were not properly bonded and solidly put together with mortar or cement. William Gimson, of Bayceaux Villa, Gipsy Hill, Norwood, was also charged, upon eight summonses, four with a similar offence as that alleged against Mr. Cole in respect of four houses in course of erection in Jeremy's Green-lane, and the remaining four that the walls of the said houses did not rest on solid ground, concrete, or other solid foundation, as required by by-law 101. Mr. Houlder, clerk to the Local Board, conducted the proceedings. The summonses against Mr. Cole were taken first. Mr. Houlder stated that the walls of the houses in question were built of very inferior materials. Small pieces of bricks had been used, and the mortar was largely in excess of the quantity required to execute work properly. Bonding together meant that bricks should bond each other, but in the present instance they did not do so. There was so much bad building going on that the Local Board were compelled to interfere, and they hoped the Bench would inflict such a fine as would induce builders to comply with the by-laws, so that houses which would become detrimental to the health of the inhabitants, as well as dangerous to those who resided in them, might not in future be erected. Robert Harrison, assistant surveyor to the Board, said the walls were constructed of bats and smaller pieces of bricks. There were eight or nine courses without any tie whatever. One course of bonded bricks was laid every few feet, and the intervening spaces were filled up with small pieces. The work was intended for Flemish bonds, but there was no real bond at all. By defendant: The mortar was of fair quality. A builder was entitled to erect concrete walls, but the system of construction which was being pursued certainly did not render the walls as strong as concrete ones. By Mr. Houlder: The bonding ought to be every other course of bricks. Mr. Grindle, chief surveyor to the Board, said the mortar was good, but the bricks were the most inferior he had ever seen. The walls were not bonded in the true sense of the word, except by the tenacity of mortar. By the Bench: Having regard to the safety of persons who might occupy the houses when finished, he should pronounce the walls insecure. Defendant said he had expressed his willingness to do anything the surveyor to the Board might suggest to remedy existing defects. Mr. Abbess inquired if anything could be done short of pulling down the walls to secure the safety of occupiers. A discussion arose, in the course of which a suggestion was made that the necessary strength to the walls could be given by having them coated with cement, and eventually an adjournment for three weeks was ordered to see if any scheme could be devised and carried out to the satisfaction of the Board's surveyor, the Bench intimating that, as the offences charged had really been committed, it must not be understood that a fine would not be imposed. In Mr. Gimson's case it was shown that the spot where the buildings were being erected was not very solid ground, and that the plans sent in for the approval of the Board provided that 12in. of concrete were to be laid to form the foundations of the houses, whereas the amount put in was only from 1½ to 4in. in depth. The substance itself, too, was of a very inferior quality. The mortar, also, was exceedingly bad, consisting of very small portions of sand and lime, the rest being vegetable mould. Samples of mortar were produced, and the Bench said they could scarcely detect the presence of sand or lime. Defendant said every ingredient for making good mortar was upon the ground, and if the material was bad it was owing to the negligence of persons in his employ. The Bench said bad materials were used by many builders to save a little money, even at the cost of loss of character. The magistrates would assist local authorities as far as possible to insure the erection of proper buildings; and in the hope that others would take warning by the result of the present case, defendant would be ordered to pay £2 10s. in respect of each of the eight summonses—£20 in all—with costs, the amount, if not paid, to be recovered by distress.

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The Rhiwsaeson branch of the Llantressant and Taff Vale Junction Railway has just been commenced by the contractor, Mr. Billups.

Our Office Table.

THE artistic accessories of the obelisk known as Cleopatra's Needle have been this week submitted to the judgment of experts in art and Egyptology, so far, at least, as a specimen sphinx and other smaller details are concerned. The four sphinxes will be of two different sizes, the one of which a temporary bronzed plaster cast is in position being of much the same dimensions as the lions in Trafalgar-square, to the attitude and form of which it closely approximates. Metal plates of a pyramidal form, fluted and winglike, have been substituted for the pieces of syenite which have broken away from the bottom of the obelisk, between every pair of which another metal plate is let in, adorned with serpents and other sacred symbols of the Egyptians, which are also reproduced in the forehead and the breast of the sphinx. At the base of the obelisk it is intended to inscribe the name of Thothmes III, in commemoration of whom the obelisk was primarily produced.

THE subject of Norman masonry has been a rock of much dissension among archæologists, as we have seen in the disputed origin of Colchester Castle. As the following remarks by the Rev. Edward L. Cutts, in his pamphlet entitled "Colchester Castle not a Roman Building," are relevant to other instances, we may quote them here. Speaking of herring-bone masonry, Mr. Cutts says, "it is almost as much a Norman as a Roman peculiarity; it may be found in stone work in Lincoln Castle, Peak Castle, &c., and in a wall of much later date in Trinity College, Cambridge. The bonding courses of bricks at regular intervals are nearly always found in Roman buildings, even where stone was more accessible than brick, but they are always laid with much regularity and at intervals." The author then quotes Mr. M. H. Bloxam, who has examined very carefully the peculiarities of "ancient mixed masonry of brick and stone," who writes, "In the castle of Colchester, which also appears to be a Late Norman structure, we may perceive an attempt made to imitate the appearance of Roman work in the regular and horizontal layers of courses of Roman brick throughout the walls at intervals, and this is, perhaps, the nearest approximation to Roman work in external appearance we have; but when examined closely, the number of intervening courses of stone and brick greatly differ, and do not present the same degree of proportion generally observable in Roman work." Other instances are cited of herring-bone work in the Norman castles at Penline, Tamworth, Corfe, and Guildford. Brick and stone in separate or alternate layers occur at Coggeshall Abbey, of thirteenth-century date, St. Alban's Abbey, and in other Norman buildings.

THE Council of the Society of Arts have awarded medals to the following gentlemen for papers read during the session which is just over.—Major-General H. Y. D. Scott, C.B., F.R.S., for his paper on "Suggestions for Dealing with the Sewage of London;" A. J. Ellis, F.R.S., for his paper on "The History of Musical Pitch;" John Sparks, for his paper on "Recent Advances in the Production of Lambeth Art Pottery;" Henry B. Wheatley, F.S.A., for his paper on "The History and Art of Bookbinding;" W. Holman Hunt, for his paper on "The Present System of Obtaining Materials in use by Artist Painters, as compared with that of the Old Masters;" Thomas Fletcher, for his paper on "Recent Improvements in Gas Furnaces for Domestic and Laboratory Purposes;" John C. Morton, for his paper on "The Last Forty Years of Agricultural Experience;" Prof. Heaton, F.C.S., for his paper on "Balmain's Luminous Paint;" Captain Abney, R.E., F.R.S., for his paper on "Recent Advances in the Science of Photography."

THE following are the prize students in Architecture at University College, Session 1879-80. Construction: Second Series, Donaldson Silver Medal, A. S. Vowell, of London. Certificate, 2. *C. H. Bedells, of Crouch-end. Third Class. F. W. St. Aubyn, of London. First Series, Prize. C. J. Tait, of London. Certificate, 2. *F. S. Ogilvie, of North Shields. Third Class. S. J. Bury, of Whetstone. Fine Art, Second Series. Donaldson Silver Medal, A. B. Pite, of London. Second Class. Wm. A. Pite, of London. Third Class. F. A. Gerrish, of London. First Series, Prize. W. J. Lander, of London. Third Class. B. V. Westbrook, of London, C. Turner, of London. Modern Practice, Prize. Fr. E. Eales, of London. Certificates, 2. *R. E. Smith, of Forest Hill. 3. A. G. Morten, of London. 4. *equal.* S. J. Bury, of London, F. G. F. Hooper, of London. Ladies' Class, Prize. Laura E. Jones, of London. Certificate 2*, Edith M. Smith, of Forest Hill. Second Class. Elizabeth Beck, of London. Third Class. Hannah Oliver, of Kew. The Council of the College have appointed Mr. Roger Smith to conduct these classes for the Session 1880-81 in the absence of Professor Hayter Lewis. Names with (*) attached obtained the number of marks qualifying for a prize.

THE Lord Mayor has granted the use of the Mansion House for a meeting on Friday, July 2nd, in aid of the Fund for Completion of the Buildings of University College, London. Among others, the Earl of Derby, the Earl of Kimberley, President of the College, and Sir John Lubbock, Bart., M.P. for the University of London, will be present, and the Chair will be taken by the Lord Mayor at 2 o'clock, p.m. The whole cost of completing the buildings of the College is estimated at £105,000. A part of this sum, towards which £20,000 have already been subscribed, will cover the expense of erecting a new section of the north wing, which the rapid growth of the work of the College has made immediately necessary, and which will be open to students next October.

THE death is announced, after a long and painful illness, of Mr. William Henry Turner, of the Bodleian Library, Oxford, at the age of 52. Mr. Turner served his apprenticeship as a chemist, but soon betook himself to scientific and antiquarain pursuits, and of late years was employed by the Curators of the Bodleian Library in deciphering old documents which had not seen the light of day for centuries. In connection with Bodleian work he was engaged on the well-known Calendar of Charters which bears his name, and until his illness on the equally important work of indexing the Dodsworth MSS., under the authority of the Corporation of the City of Oxford. Under the direction of the Town Clerk (Mr. R. S. Hawkins) he recently produced avaluable book, the first of a series entitled "Selections from the Records of the City of Oxford," with extracts from other documents, illustrating the municipal history of that city from Henry VIII. to Elizabeth, 1509-1603. Mr. Turner was entrusted some years ago with the important task of editing the Harleian Society's production on "Oxfordshire."

IN the forecourt of Essex-street Chapel, a monument has just been put up to commemorate the founders of Sunday-Schools. The pedestal, designed by Mr. Hugh Stannus, and of suitable form, is of Portland stone, with panels of polished red granite, and is made a prominent feature of the design. The projecting front, which is circular on plan, contains a long inscription, the purport of which is the commemoration of the Christian efforts of the originators of Sunday schools (members of the various churches) from the time of Cardinal Borromeo, 1580, to that of Theophilus Lindsay and Robert Raikes, 1780. At the sides of the pedestal long narrow panels of polished granite record the names of the founders, their dates, and the churches to which they belonged. We congratulate Mr. Hugh Stannus, the artist, on the modelling of the figure which temporarily surmounts the pedestal, which was placed on it for the inauguration, and will remain for inspection a few days. The boy has an intelligent and bright countenance, and the figure is conceived in a free and natural manner, but perhaps a trifle too small for its position.

ON Wednesday afternoon, the Lord Mayor paid a visit to the East-end of London, for the purpose of opening an industrial and fine-art exhibition at the Bow and Bromley Institute. The exhibition has been promoted with a view to encourage inventive skill, excellence of workmanship, and the wise employment of workmen's spare hours. The articles exhibited are arranged under five heads—namely, mechanical articles, artistic, general fabrics and fancy work, and work done by young persons under 18. Fifty guineas in prizes were offered, of which the Clothworkers' Company gave £21. The

Coopers' Company provided a special prize for the best specimens of cooperage or articles connected with that trade. Various firms lent interesting specimens of their particular trade; thus, Messrs. Doulton and Co. sent some beautiful articles of pottery; Mr. Samuda, formerly M.P. for the Tower Hamlets, contributed some models of ships, as did also the Thames Ironworks Company, and Messrs. Westwood and Baillie; and Mr. Wilberforce Bryant, of the firm of Messrs. Bryant and May, sent a valuable collection of Japanese bronzes, carvings, and armour. In all, 492 articles are exhibited, 103 being mechanical, 196 artistic, 70 general, 60 in fabrics and fancy work, and 70 the work of young people under 18. The mechanical include models of buildings, engines, ships, machinery, and cooper's work; the artistic comprise articles of terra-cotta, stone, china, ivory, wood, oil and water-colour paintings, and crayon and pencil drawings; the general classes include musical instruments, objects of natural history, screens, and furniture; the fabric classes embraced embroidery, needlework, leather and wool-work; while those exhibited by young people comprise specimens of all these diverse objects.

CHIPS.

The parish-church of Burgh-by-Sands, near Carlisle, is about to undergo restoration. The nave will be re-roofed, new windows inserted, the plaster removed from the walls, showing the old masonry, a new floor laid, benches substituted for pews, and a small gallery containing 40 sittings will be built at the west end. The total cost, including heating apparatus, will be about £1,500.

The town council of Ipswich considered, at a special meeting, held on Wednesday week, a communication from the Commissioners on Historical Manuscripts, asking permission to examine and report upon the many ancient records belonging to the corporation. This would be undertaken by Mr. J. Cordy Jeaffreson, the commissioners' inspector, who is, by the way, a Suffolk man. In the discussion which followed the reading of the letter, it was stated that there were a large number of documents of various ages which were in great confusion, as they had never been deciphered. It was unanimously resolved to grant permission to the commissioners to examine and report on the documents.

Plans for improving the harbour and dock of Youghall, Co. Cork, have been prepared for the local harbour board, by Mr. Kirkby, C.E.

The annual meeting of the Bristol and Gloucestershire Archæological Society is fixed for the 21st inst. and two following days, at Stroud. The Somersetshire Archæological Society hold their meeting on the 24th August, at Glastonbury, under Mr. E. A. Freeman.

The new Mayo memorial infant-school in Pelham-lane, Dorking, was opened on Thursday, the 24th ult. The building accommodates 70 infants, and cost £800. Messrs. Goddard and Son were the builders, and Mr. Rhode Hawkins was the architect.

Another section of the Yarmouth and North Norfolk Railway—to Stalham—was to be opened for traffic yesterday (Thursday), and the remainder of the line authorised by Parliament to North Walsham is being rapidly proceeded with. Messrs. Wilkinson and Jarvis are the contractors. A Bill is at present being considered by a committee of the House of Commons, for an extension from North Walsham to Fakenham, to form there a connection with the Lynn and Fakenham Railway.

The Shropshire and West Midland Agricultural Show will open at Bridgnorth on the 21st inst. The contractor for shedding and tents is Mr. C. R. Clarke, of Stoke-on-Trent, who has already commenced operations.

For some time past an engineers' wooden hut has been erected upon the summit of the central tower of Gloucester Cathedral, for the purposes of the new Ordnance Survey in that city. The temporary structure has now been taken down, and the Royal Engineers engaged on the work have given the following figures as exact measurements of this nobly-proportioned tower:—From the surface of ground to the top of the crosses on the pinnacles, 225ft. 10in.; height of pinnacles above the tower-roof, 53ft. 5in.; size of pinnacles on the outer projection of cornice, 8ft. 10in.

The new church at Burton Leonard, near Ripon, built in 1878 from the designs of Mr. C. H. Fowler, of Durham, has been beautified by the filling-in of the five-light east windows, with stained glass, by Capronnier, of Brussels, representing the Ascension, and by the erection of an organ, built by Mr. Abbott, of Leeds. The case of this instrument, which was opened on Thursday week, is of pitch-pine, varnished, and the front pipes are diapered in gold and sage green.

The memorial-stone of a Congregational chapel now being rebuilt in Bethesda-street, Merthyr Tydfil, was laid on the 24th June. The chapel will have a schoolroom beneath it, and is being built at a cost of £1,100, from the designs of Mr. John Williams, of Morganstown, the contractor being Mr. J. R. Francis, of Dowlais.

The Epping Forest and County of Essex Naturalists' Field Club will hold a field-meeting to-morrow (Saturday) afternoon, for the purpose of thoroughly inspecting the ancient earthworks of Ambresbury Banks and at Loughton. The archæological conductor is Major-General Pitt Rivers, F.R.S.

A line of railway is being constructed through the Myrydd Mawr district, near Llanelly. Mr. Waddell is the contractor.

The *Hastings and St. Leonards Times* remarks that ill fortune still attends the ancient borough and cinque port of Seaford. The latest and most promising scheme for its conversion into a Sussex watering-place has not been successful. The world, and Sussex in particular, have not sufficient faith in the splendid destinies of Seaford and the shares of the Seaford Estate Company, Limited, have not been taken up so readily as they should have been, and it is understood, consequently, that the money will be returned to the depositors.

The memorial-stones of a new Wesleyan chapel, at Old Ford-road, Bow, E., were recently laid. The building will replace a school-chapel, will cost £4,750, and will seat 1,000 persons.

The new Temperance Hospital, at the south end of Hampstead-road, was opened a fortnight since. When completed it will be on plan E-shaped. The limbs and stem will contain wards, and in the centre of the block will be the staff accommodation and operating-theatre. The wards next the road will be placed above 6 shops, which will be let off. Thirty-four beds are provided at present. The site has cost £8,500, and the builder's contract £11,000. Mr. T. H. Barker, of Manchester, was the architect, and Mr. McIlroy, of Charlotte-street, Bedford-square, and of New York, designed the operating-table and bedsteads.

The ordinary macadam paving on Waterloo Bridge having proved quite inadequate to sustain the heavy traffic brought over it since the freeing of the bridge, the Metropolitan Board of Works have determined to substitute for it 3in. by 9in. granite cubes.

New Board-schools were opened at Beighton, North Derbyshire, on Monday. They are built of Dunford Bridge stone, with Stanton stone dressings, and face the main road to Killamarsh. The total cost, including master's house and school-furniture, has been £2,987, and accommodation is provided for 270 scholars.

The contractors for the new municipal buildings at Hastings, Messrs. D. Jones and Co., of Gloucester, are making rapid progress with the work, which already forms a marked feature of Queen's-road; the architect is Mr. Andrews, the borough surveyor. Just opposite, a new coffee-palace, for which Mr. A. D. Womersley is the contractor, is being built, while, close by, preparations are being made for the erection of an opera-house.

The memorial-stone of an English Congregational chapel was laid at Briton Ferry, last week. The building will be Gothic in style, and will have a spire 66ft. high. The estimated cost is £2,161.

The little church of St. Mawnan, about four miles from Falmouth, was reopened on Wednesday week after restoration. The nave has been re-roofed and re-seated, and the south arcade has been extended; the chancel has also been re-arranged. Mr. J. Piers St. Aubyn, of the Temple, London, was the architect.

A breakwater is being constructed at Brixham, Devon, under the supervision of Mr. Piper. The work is being executed in solid blocks of concrete, and the portion completed measures 1,300ft. in length.

Mr. W. Prout, of Lewannick, was on Wednesday week elected surveyor to the Holsworthy Highway Board at a salary of £105 per year. There were 25 candidates, who asked salaries varying from £80 to £200, and the selected candidate was placed second in the recent election of surveyor to the Launceston Highway Board.

The Glamorganshire county magistrates, on quarter sessions assembled on Monday, adopted plans proposed by the county surveyor for a stone bridge at Pontynisbont, of one span, and estimated to cost £1,400.

The Holywell board of guardians on Friday adopted plans prepared by Mr. Douglas, of Chester, for the enlargement of the union workhouse. Accommodation will be provided for 205 additional inmates, at an estimated cost of £3,000.

The Blaengwawr Board-schools at Aberdare were opened on Monday. They accommodate 754 children in three departments, and have cost, including the purchase of freehold site, £4,600, equal to £7 per head. Mr. E. H. Lingen Barker, of Hereford, was the architect, and Mr. J. Morgan, of Aberdare, the contractor.

A new presbytery is now in course of erection at Longton, from the designs of Messrs. Pugin, of Westminster. It will cost about £2,120. Mr. Wm. Collis, of Loughton, is the contractor.

At the Pembrokeshire quarter sessions, held on Monday, the plans of Mr. George, the county surveyor were approved for the widening and improving of Cartlett-bridge.

The North-British Railway Co. have begun operations at Colton Junction, near Dunfermline, with a view to the replacement of the large wooden viaduct which carries the railway over the street, and over the old Charlestown railway, by a new bridge of stone and iron. Mr. Carbcwell is the engineer.

A plan of the burgh of Galashiels has been all but completed. The plan is on a scale of 10·56ft. to the mile, and includes all that is shown on the Ordnance Survey plan. The survey was entrusted to Mr. G. A. Lundie, M.I.C.E., Cardiff, and the work was commenced in October last.

The Neath town council met on Saturday to appoint a manager of the Corporation gas-works. Out of 77 applicants, Mr. R. A. Browning, of Plymouth, was selected.

An oak chair has just been carved for the Bishop of St. David, by Messrs. Martin and Evans, of Cheltenham, from the designs of Mr. H. Middleton, of the same town.

The "Northcote" Hall at St. Marie's College, Oscott, near Birmingham, is now about to be completed from the designs of Messrs. Pugin, of Westminster. The cost will be about £2,500. Messrs. Wm. Sapcot and Son, of Camden-street, Birmingham, are the contractors.

A new Primitive Methodist chapel was opened at Winterton, Lincolnshire, on the 23rd ult. It is situate in Queen-street, and has been built by Mr. C. Snowden, of Great Grimsby, from the designs of Mr. Wright. The cost has been £1,500, and 500 sittings are provided.

The Selhurst extension of the Croydon street tramways was opened to the public last week, after inspection by Major-General Hutchinson, of the Board of Trade. The whole length of the line for which Parliamentary powers have been obtained, in all 4 miles $31\frac{1}{3}$ chains, has now been constructed, and is in use.

The Roker Park, Sunderland, was thrown open to the public with formal ceremony on Wednesday week. The park has been presented to the townspeople by Sir Hedley Williamson and his heirs, as a place of public resort and recreation.

The foundation-stone of a new Congregational chapel at Headbridge, a suburb of Chester, was laid on Wednesday week. The site is given by the Duke of Westminster. The building will be of plain character, and will seat 400 persons, at a cost for erection of £1,800. Mr. T. M. Lockwood, of Chester, is the architect; and Mr. Huxley, of Malpas, is the contractor.

A convent church and choir, for the Sisters of the Visitation, are now being built at Roselands, Upper Walmer. Messrs. Pugin, of Westminster, are the architects; the cost will be about £1,900. The contractors are Messrs. Wand and Denne, of Upper Walmer, Kent.

At a meeting of one of the committees of the Leeds Town Council held last week, the Borough Engineer was instructed to prepare alternative plans for a small-pox hospital proposed to be built upon ground belonging to the Corporation adjoining the rubbish destructor at Burmantofts. One plan is to show accommodation for twenty, and the other for forty patients.

The state of the Jedburgh Grammar-school buildings has long been a subject of much anxiety to the Burgh School Board. Several plans have been sent to the Department, but none has been approved of, and on Tuesday an architect from London visited Jedburgh to inspect the buildings. The feeling of the place seems to be in favour of a new school.

An important development of freehold property seems likely to take place at Ilford. The second portion of the Clement's Estate, consisting of 93 lots of freehold land, is announced for sale on Thursday next, at the Angel Inn, Ilford, by Messrs. Protheroe and Morris, who have previously sold the whole of the lots in the first portion.

In our recent description of "Mr. Colin Hunter's House at Kensington," we omitted to state that the drawing-room frieze mentioned was made and supplied by Mr. Robert Christie, of 102, George-street, Portman-square, W.

THE BUILDING NEWS.

LONDON, FRIDAY JULY 9, 1880.

WESTMINSTER VESTRY-HALL COMPETITION.

THE competitors who were invited to send in designs for the vestry-hall and offices for the united parishes of St. Margaret and St. John, Westminster, have, with few exceptions, answered the invitation, and the drawings are now on view at the schools, on the site in Alexandra-street, Victoria-street. We find on inspection that ten designs have been hung. These, with one or two exceptions, are in the Renaissance or Classic style, and display some diversity of handling. The competitors seem to have done their best to utilise the site, though in some instances the buildings are made to cover so large a proportion of the area, that little space is left for light and air. One of the instructions to architects laid some stress upon the advisability to leave clear and open spaces for light and air, and each competitor was left to make his own decision upon this point, as well as to the expediency of leaving sufficient space between the building and the railway. We consider the best plans are those which have contrived to light their back offices in their own ground, and have simplified the buildings and their roofing by adopting two or more distinct blocks with intermediate spaces, instead of building close up to the line of side street, as some have done. It would not be desirable to cover the whole area, as some suggest, with buildings of different heights—a plan that would entail costly roofing and repair. The position of the vestry-hall and its central situation near the offices is an important point, and we see several modes of dealing with it, some placing it between the offices and the assembly-hall, and others in front. Above all, the provision of separate entrances for the public offices, and the vestry-hall and assembly-room, is a feature we trust that will receive due attention.

The leading condition was that the buildings and all fittings, except movable furniture, were not to exceed £15,000, beyond which were a number of suggestions as to the requirements. On the ground-floor, vestry clerk's offices, of certain dimensions, a waiting and strong-room, rate-collector's, surveyor's, sanitary inspector's, solicitor's, medical officer's, gas-meter testing-rooms, and a large assembly-room, capable of holding 1,000 persons, were to be provided; and on the first floor a vestry-hall, 50ft. by 42ft., exclusive of a strangers' gallery, capable of seating 50 or 60 persons, a retiring-room, committee-rooms, a members' hat and cloak-room, with proper ingress and egress, and lavatories, also library, conference, and waiting-room, and certain dimensions were specified for these rooms, though the competitors were free to exercise their discretion as regards the size of some of them. A good entrance-hall and staircase, and a secondary stairs in the rear, were also suggested, besides housekeeper's basement, and other accommodation. As regards the drawings, they had to be drawn in Indian ink, and the perspective was limited in size, so that its extreme height above street should be to a scale of four feet to the inch. Premiums of £100, £70, and £50 were offered.

"Stet" is unquestionably one of the boldest ink designs in the room. Its author has chosen Renaissance, and proposes a lofty centre block, which forms the entrance, crowned by a domical roof at the top, with side bays carried up in the end wings, having high roofs and dormers. The composition is symmetrical and dignified. The ground-plan is cleverly disposed; the vestry offices form the front block, there is a centre hall and stairs, which communicate by a wide corridor traversing a middle block of offices, to a large hall placed transversely at the end, 81ft. by 42ft. 6in. The centre block of offices is well lighted by areas on each side within the boundaries of the site, which, we think, is better than building up to the limits of the land on either side; it is devoted to the medical officer and sanitary inspector, &c., and good lavatories, &c., are shown at one end close to the hall, with ample means of ventilation. The rate-collector, an important official, whose office is frequently besieged, occupies the left end of the front block, and has a side-lobby entrance, which is very necessary. The vestry clerk is located at the other end of the façade, and is provided with a well-placed strong-room, the clerks' office being lighted from back area. We notice a separate end entrance to the public hall, which has a semicircular end, a platform is shown at the other, and the ante-rooms are obtained in the triangular space obtained between the railway and the hall. On the first floor a large committee-room, 42ft. by 23ft., is obtained over the vestry-clerk's offices; a library is shown over the rate-collector's, and committee and other rooms intervene in front. The vestry-hall forms the centre block over the sanitary department, well lighted from the side areas; it is 49ft. by 44ft., and is convenient as regards the staircase and official offices. A good gallery to hall, and members' lavatory, are also provided in connection with this floor. The upper floor is occupied by the housekeeper's rooms, and the basement by the kitchen, strong-rooms, &c. The staircase is well lighted by a skylight over the hall. We notice one or two detail drawings; one a pencil-sketch of vestry-hall interior, showing a flat panelled-ceiling, and Elizabethan detail to gallery.

The design marked with a Black Star is also a clever English-Renaissance design, to which justice has been done by a rather flattering drawing in ink, by a hand well known to us. We cannot avoid saying the elevation is heavy-looking, and that the position of the hips over the entrance and the general roof-lines are somewhat awkward. In front the building is broken by three projecting windows corbelled above the plinth, and the entrance is marked by a porch with deep corbels. In the plan, the author has followed the same general disposition of the departments with side areas, the chief difference being that the housekeeper is located on school side of the middle block. The rate-collector has a side entrance, and the vestry-clerk and surveyor have also front rooms, while the sanitary and medical department is obtained behind, and is lighted by the side area. We cannot approve of the solicitor's position, who is squeezed into a queerly-shaped room, lighted from the area at one corner of the hall. Latrines are on the wrong side between the public hall and front offices. The hall is 75ft. by 34ft., and shows a platform or rostrum projecting from one side, partly filling up the uneven ground. It has a side entrance. The entrance hall is lighted by a lantern, but the lobbies and passages to the rate-collector and other rooms are a little bewildering, and might have been much simplified. On the first-floor is a vestry-hall 50ft. by 42ft., with horse-shoe table, arranged over the centre block. Surely the provision for the hat and cloak-rooms is greatly in excess of requirements. Along the front, approached by a corridor, are committee, sub-committee, and deputation rooms.

"Unitas" is a design of merit in planning, and is distinguished by no less than four alternative studies of the elevation, two being Gothic and two Renaissance in style. Of the former, we rather prefer the design marked A, though the drawing hardly does justice to it. The alternative is perhaps of too domestic a type for public offices, in spite of some good detail; but the Renaissance designs are better than either, and are suitably treated. In the planning the author has judiciously set back the building from the side street by areas for light, and he has also avoided the objection of introducing windows to face the back offices of the school, which other authors have thoughtlessly done. The principal feature of the plan is an octagon hall at the back, approached by a long corridor through the official block. The offices occupy the front and a middle block, and are disposed along corridors. An alternative arrangement, B, shows a different distribution of the offices. The sanitary and gas departments occupy a centre cross block, separated by areas from the front and back buildings, by which means light and air are secured. The staircase, with circular end, is better lighted in this plan; but some objection may be taken to the long corridor entrance to the public hall. The vestry-hall is placed on the first floor in a retired and good central position. The large octagon hall has a projecting lobby entrance, and is lighted by a lantern in the centre. The iron principals to the roof are scarcely suitable for a permanent room, and we should have preferred timber framing. A great deal of labour has been expended on these drawings, and the author has fairly studied the requirements.

French in spirit and detail is another Renaissance design under the motto "La Casa della Citta," shown by a boldly-drawn ink perspective. The elevation is broken into three parts by a wide centre-block, roofed higher than the wings, the hips meeting in a point; the author goes in for a large hall and stairs, which, together, occupy a considerable area of the ground-floor, and which curtail the areas for light and air so much, that borrowed light is found necessary for the clerk of works' office, &c. Rather out of the way are the inspector's rooms; the front offices look cut-up, and the corridors are irregular. The large hall is placed behind, 63ft. by 50ft.; altogether, we are not quite satisfied with the means of communication. The vestry-hall is 51ft. by 42ft., and is placed over the entrance. "St. John and Margaret" in garter, is an attempt which loses sight of the business to be conducted in a metropolitan vestry-hall, in the endeavour to impart a Mediæval character to the exterior. The ink-perspective shows a lofty tower, with belfry, in a Renaissance style, which rather overpowers the rest of the composition. It is crowned by an open belfry. The best part of the elevation is the series of large mullioned windows, which light the vestry-hall on one side of the tower. Looking at the ground-plan, we observe a confused corridor arrangement, the approaches to sanitary inspectors' rooms are tortuous. The clerk and surveyors' offices are in the front block, with access by corridor, lighted at end. In the smaller left wing is the rate-collector's office, with its entrance. The assembly-hall is 74ft. by 39ft., and is placed in the rear with windows at the side. We note that the vestry-hall on first floor in front is meagrely planned in its entrance, and the corridor is unsatisfactory; there is a general want of economy in the distribution of the departments, and the areas and lighting are not good. "Fortuna Sequator" is a heavily-roofed Classical building. The offices in front are approached by a long corridor, ill-lighted, with an entrance at one end; there is a large square staircase, 30ft. square, lighted from the roof, besides an open area in front of stairs, which lights also the solicitor's room, a small apartment. The public hall is 72ft. by 49ft. and is placed in the rear, its windows being on one side, and a corridor approach on the other. The vestry-hall on the first floor is 47ft. by 45ft., an unpleasing proportion, and is located in the front of building at the corner, the lighting being from front windows and by a skylight. The large hall is also partly lighted from roof. It would have been better if the committee-rooms on this floor had been less scattered; the plan is weak in its grouping. "Civis," a Classic structure, in Indian ink, is somewhat prosaic in its treatment; it has a Corinthian order on a basement and a centre pediment, with a lofty tower at one end, emphasising rather unmeaningly the rate-collector's entrance. The plan has a symmetrical arrangement; small areas, with windows, chiefly on the front and right-hand side, are shown. An entrance leads to a lobby with surveyor's department on right, and vestry-clerk on the left-hand. These offices are subdivided by glazed screens. The rate-collector has his separate entrance, and the solicitor and medical officers' rooms face an inner hall and stairs. The entrance corridor continues to a large hall, 72ft. 6in. by 41ft., transversely disposed with a side entrance. The sanitary and gas offices are lighted from an area. An alternative plan proposes to reverse the positions of the vestry-clerk and solicitor, and the medical officer. A vestry-hall, 56ft. by 42ft., is obtained on the first floor in front, with retiring-room below the gallery. Generally, the arrangements exhibit study; the plan has been symmetrically disposed on the site, and the committee-rooms, the staircase, and the balcony approach to hall are well planned. We have only space left to remark briefly upon the other designs. "Duty" is a remarkable design in a Perpendicular Gothic style, the principal feature being a large entrance hall 60ft. by 30ft., out of which all the offices are made to open. The author calls his plan radiating. Behind the great hall is the grand stairs, while the offices surround the hall on three sides, the vestry-clerk, and surveyor forming two opposite wings on each side. On the first floor is a council-chamber over the hall, and the sanitary inspector is also located here, a rather awkward and undesirable position. The public hall, 80ft. by 40ft., is shown parallel to the railway with separate means of ingress and egress. A "Shield and Cross" is the motto of an ill-digested plan, in which the space is not economically divided; the public hall, 92ft. by 30ft. has corridors on three sides, and the principal offices are ranged along the front; the entrance to vestry-hall, on the first-floor, is poorly planned. The elevation has a large centre-tower and cupola, in a kind of Renaissance, but the detail is poor. "Suum Cuique" also shows an ill-planned arrangement, with a large octagon hall at back, while the means for lighting are much too small. The composition, in a Renaissance style, is heavily grouped, though bold in parts, and the design is spoilt by the unsatisfactory roof-line that seems to have a crushing effect.

After keeping the competitors waiting five or six weeks, it is only fair that the drawings, many of which display considerable labour, should be thrown open for public inspection. This will be done, we trust, when the professional report has been made, the preparation of which the committee have decided to entrust to Mr. Charles Barry.

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THE TAY BRIDGE DISASTER.

NOW, upwards of six months after the most dreadful railway accident which has ever occurred in this country, the report of the tribunal appointed to adjudicate on the cause is published. The nature and character of the report before us indicate that much consideration has been given to the subject by the able commissioner and his colleagues in arriving at their almost unavoidable conclusions. Nothing, it may be said, has been wanting in sifting of evidence and grappling with details, all of which are more or less familiar to the public, and it may be said that the result of this painful inquiry will be received with unmixed satisfaction. Had the accident taken place in any other division of the United Kingdom than Scotland, coroners' inquiries would have undertaken the duty of examining into and deciding on its cause, and it may be regarded as fortunate that the whole inquiry rested with the Board of Trade.

The judgments now delivered may be said to be unanimous, although Mr. Rothery has boldly, and we think honestly, insisted upon using such language as cannot be misunderstood, and attributes the blame to the right cause. He says, "The conclusion, then, to which I have come is, that this bridge was badly designed, badly constructed, and badly maintained, and that its downfall was due to inherent defects in the structure, which must, sooner or later, have brought it down."

So clear an indictment admits of only one construction, and we fear the party charged with the offences thus clearly set forth will have much difficulty in persuading even the most charitable and well-disposed to him personally that the charge is too condemnatory in character.

Let us examine the causes which led up to this disaster, and endeavour to understand why so much enterprise, money, and engineering talent failed so lamentably in solving the problem of crossing the Firth of Tay by a bridge. Presuming that the North British Railway Company had not limited their engineer to a certain defined sum for the outlay on the structure, we cannot understand why a bridge of the style and character of the Tay Bridge was resolved upon. To cross an arm of what may be called the sea in a notoriously exposed situation, the bottom of the channel of which was, from geological causes, of a rough and unreliable character, should have created in the mind of the designer of the desired bridge the utmost anxiety as to the foundations of such a structure. Indeed, no progress in any direction should have been determined on until that most vital point had been settled beyond the possibility of doubt. Here we find, however, that, owing to some mistake of the "borers," sound rock was said by them to be where it was afterwards found that a chasm existed filled up by boulders, or other diluvial deposit. An alteration of the length of the spans followed on this discovery, indicating that the design of the bridge had been proceeded with before it was quite clear that the piers could be well and substantially founded. This discovery also involved an alteration in the piers, which had originally been designed of brick, and the cast-iron "stilts" were substituted, for the purpose of lessening the weight on the foundation cylinders. So that we have, at a very early stage of the business, undoubted evidence of derangement, owing to the uncertain character of the base of the intended fabric. That nearly all of the bottom cylinders were well and truly deposited, cannot be questioned, for, in addition to the skill displayed in their preparation and transportation to the various points, they had the advantage of great weight, which, when accurately placed by the divers, would secure them against displacement by tidal currents. So far, therefore, as the foundations proper of the Tay bridge are concerned, they may be regarded as perfect of their kind, for no damaging reference has been made to the materials of which they were composed.

The columnar cast-iron piers seem, however, to have been badly conceived, badly made, and no doubt improperly put together. The vertical cracks in several of the columns are attributed to an expansion of the cement-concrete with which they were filled after erection. Such a disturbing influence is no doubt quite possible; but, seeing that the cement was carefully tested by the resident engineers, the result conjectured is not, to our minds, quite satisfactory. We would rather look to the workmanship at the Wormit Foundry, where the columns were cast. This appears to us to be the most lamentable branch of this unhappy business, to judge from the evidence of the workmen examined at the inquiry. During our own experience, we have found that men employed on public and other works are too prone to indulge in illegal and improper acts without deriving the most remote benefit from their misconduct, but simply from an innate and unaccountable desire to dodge and "best" their overseers. In the foundry department, there was not only an amount of reckless ignorance, but a wilful and reprehensible disposition, on the part of all concerned, to "scamp" their work; otherwise, how could the imperfectly-made column, of such vital importance to the structure, have been made, or if made, allowed to form part of a bridge every member of which was dependent on each other for its stability? The hexagonal plate, or base, on which the columns and their connecting braces rested was founded on the extension of the submerged piers, and bolted down by 1¾in. bolts, 2ft. 6in. long. These holding-down bolts appear to us absurdly deficient in character, and could not resist, with advantage, any upward or oblique thrust, acting violently either on the platform of the bridge, or the cast-iron piers. These bolts never could have been regarded in any of the engineer's calculations otherwise than as mere subordinate factors in maintaining the true position of the base-plate against the vertical thrust of the superincumbent mass only.

Even assuming that the principle of cast iron supporting columns was a correct one, and every figure in the calculation of their competency accurate and sound, the necessity existed that they should be well made and accurately fitted to each other, as well as to the braces from which they were to receive assistance during the occurrence of lateral thrust. What is the result of the investigations in this direction? We find defective castings moulded in an improper position, and the lugs of columns and braces, on which so much depends, imperfectly bored, rendering their accurate combination impossible. The piers should have been as rigid as science and attention to detail could have made them; but they became almost articulate in character when the movements resulting from passing trains disturbed the numerous joints, destroying their coherency, and becoming, as was very evident, "chattering" and disorganised members of the then undoubtedly degraded structure. The platform, as if in mockery, is described as perfect in character, rails and their guards being accurately "fished," and well calculated to withstand the ordinary wear of a passing traffic. The lattice-work also was well designed, and executed in a fair quality of material, only showing still more clearly that so far as the superstructure was concerned nothing was neglected to render that portion of the bridge pleasing and fair to look upon. How fragile, however, these wrecked girders look in their present position on the shore at Broughty Ferry! and few of those uninitiated in the mysteries of engineering calculation would believe that they were ever competent to support the traffic which passed over them.

The science of constructive engineering has, in connection with this misfortune, received a damaging shock calculated to induce mistrust in the minds of even the most disinterested and unconcerned. This structure, famous now in more ways than one, was, during its brief existence, generally regarded as one of the most successful efforts of modern constructive ingenuity. Meeting during its early initiation with considerable opposition from various quarters, it finally entered upon the lines of the engineer, and in his hands was fashioned into a structure which, on its completion, was accepted by the engineering world as a building honourable to the enterprise of the North-British Railway Company, and creditable to the ability of its constructor.

The Tay Bridge was the practical outcome of the rivalry between two railway companies competing for the important traffic of the manufacturing industry of Dundee, although its construction did nothing more than add another link to the already-existing railway communications supplying that commercial centre with the requisite transit facilities. There was practically no absolute necessity for the bridge, such as that which called for the famous structure across the Menai Straits, but the North British Railway Company were ambitious to measure their strength with the Caledonian Railway Company, who had hitherto, in fact, monopolised the Dundee traffic.

The public do not criticise too closely the character of the bridges or other structures by and over which they are carried, having much faith in the illusory inspection by the officers of the Board of Trade, who are popularly supposed to protect them against misfortune and loss. Under other circumstances, and trusting to their own judgment, they might well have been excused if they had, looking at the fragile character of the Tay Bridge, and the long and dangerous sea crossing, refused credit to its competence and stability during a storm.

The scheme of the bridge was, in its inception and execution, controlled by the best available engineering experience, and, when completed, passed satisfactorily the Government inspection, proving it to be safe and competent to withstand all reasonable wear and tear incidental to the purposes for which it was dedicated. All these safeguards, however, failed to secure its stability, and a storm (doubtless, of unprecedented violence) made a wreck of this fairy structure, accompanied by an unusually large amount of human sacrifice, sudden and appalling in its character. The Tay bridge accident, among other peculiarities of its occurrence, is made all the more memorable from the fact of no living evidence being left behind to describe the manner and moment of its destruction. Hence, the conflicting, and somewhat contradictory estimates of intelligent minds as to the cause of accident—some contending that those parts of the bridge which fell had inherent defects, rendering them incompetent to withstand the shock of unusual and exceptional natural violence; while others, again, testify that the collapse arose from a portion of the train leaving the rails, thereby initiating the disturbance of the various structural members of the girders, rendering their further coherence and stability quite a matter of impossibility.

The various theories advanced on the stability of iron bridges especially, and the numerous suggestions as to the peculiar action of the storm-cyclone, show with much clearness that science is not on all-fours in this particular inquiry. The most eminent engineers and philosophers have had ample opportunity to air their various experiences and theories, without, in reality, imparting to the public mind any comfort from their sometimes-diametrically opposite conclusions. The Board of Trade inquiry, with its perfect machinery and powers of the most exhaustive investigation, left no doubt that all the circumstances attending this most lamentable of accidents would be searchingly examined. Evidence of artisan and engineer, so far as possible, was carefully sifted, and the inquiry assumed an unseemly prominence, owing to the conflict of skilled witnesses exerting their several abilities to defend the side on which one and the other was called upon to give testimony. Latterly, the contest at the inquiry in the North, and in London, became really the public against the engineer of the bridges—an unhappy phase of the case, for it naturally and unavoidably imported personal feeling which, under the gravity of the circumstances, should have been avoided. It may be said, in excuse, that the engineer who built the wrecked bridge was upon his trial; but under any circumstances he must be blamed—not for the storm, it is true—but for erecting a structure which succumbed to its violence. Some members of the Institution of Civil Engineers endeavoured to show, during the early correspondence after the accident, that the engineer could not be held responsible because a Government Engineer had passed the structure, and thus certified to its stability. Such special pleading, however, must fail to convince the most confiding minds, and to the intelligent it seems that no necessity for Government supervision could possibly arise if the engineer performed his duty truly and faithfully. Smeaton, Telford, and Wren, would have undoubtedly resented the insults which would have been offered to them had it been suggested that the "Eddystone," "Menai Bridge," and "St. Paul's" must be tested before being dedicated to public use and convenience. It is becoming too fashionable in these days to fall back upon some secondary cause to protect the first one, pretty much in the manner of the solicitor who, although trained to a knowledge of the law, fortifies his client's case by consulting another legal mind, thus protecting himself against the danger of action for damage which might result from his ignorance or stupidity. The converse of this principle, however, occurs in modern engineering works, for the engineer-in-chief deputes to his assistants the duty of carrying out his design; they again, in turn, split up their responsibility into as many minor parts as suits their convenience or temperament. The character of such delegated supervision is pretty well illustrated in the evidence produced at this inquiry. Iron-founders, jocularly referring to the quality of the work which they performed, and the unseemly dodges which were resorted to for the purpose of hoodwinking the inspectors, thereby securing the acceptance of materials which, under a better system of surveillance, would have been condemned as untrustworthy and dangerous.

(*To be concluded.*)

THE GAS-EXPLOSION IN TOTTENHAM COURT-ROAD.

THOSE who frequent our busy town thoroughfares have little idea of the perils to which they are exposed, and we venture to say, not one in ten thousand of the inhabitants of London could have predicted such a calamity as that which happened on Monday. Apart from the fearful havoc and destruction to life and property it has caused, the disaster, the details of which are published, raises an important question which must speedily be answered, namely, Upon whose shoulders the responsibility of superintending gas and sewer works should fall. To ascertain the extent of the damage the explosion along the line of the new gas-main has caused, we have inspected the route. It appears that the Gas Light and Coke Company had been laying down a new main, 36in. diameter, from the main in Goswell-road, which passed along Guilford-street, through Russell-square, Montague-place, Bedford-square, after which it crossed Tottenham Court-road, and was being carried through Percy-street, and Charlotte-street to join the trunk main at Howland-street. Some portion of this main, to a point in Baily-street, where the first explosion occurred, had been in use, and the remaining portion, along the route of which so much damage has been done, had only recently been laid, and had either just been or was about to be connected with the existing mains. It was while testing this portion of the pipe, we understand, before leaving the work for the night, that the accident happened. Percy-street and Charlotte-street show the greatest extent of havoc due to the explosions. Half-way down the former street we come upon a large opening where the gas has blown through two vaults, and torn up the roadway over the main pipe, which remains as left by the explosion. The houses on this side of the street are fearfully battered, but no considerable structural damage appears to have been done, as alleged by some of our contemporaries. All the windows on both sides of the street at this point have been blown in, more or less, and the houses present the appearance of having been bombarded by artillery. To show the force of the explosion we may observe that we saw a large piece of a stone cornice to one of the houses had been broken off by one of the granite stones of the road, which had been violently propelled against it. In other cases large stones and fragments of brickwork have been hurled with considerable violence, the copings and other stonework are chipped, and the brickwork of the walls damaged in places. Some of the stones and débris were shot over the houses, in some cases passing over them, damaging the rear premises, and in other instances smashing through the roof and doing other mischief. Garret and other window-frames are here and there displaced or broken. At the junction of Percy-street with Charlotte-street, which returns northwards at right angles, another explosion took place. Here the vaults of a shop have been blown in, and the brick pier below shop-window has been thrown down, and it was probably due to the sudden turn in the direction of the explosive-wave, that so considerable a havoc has been made at this point. Another gaping chasm occurs further north, which has rendered the road impassable, and several houses have severely suffered from the effects of the explosion. Two other eruptions, one at the crossing of Howland-street, are to be seen, though of less magnitude. Luckily, the pier blown down at the end of Charlotte-street did not affect the work over, as the shop-window intervened between it and the breastsummer, but with this exception (and, altogether, we find six upheavals of the roadway have taken place) we find no house-front, or wall, seriously or structurally damaged, and none blown down. But, allowing for exaggerated statements, the injury done is serious and alarming enough, and calls for immediate and searching inquiry. We are told by one account that the total length of the new main was two miles, that 600 yards of it from Tottenham Court-road, through Percy and Charlotte-streets, had been completed, and only required the connection with the old trunk to be made. Between the two sections from Tottenham Court - road, one running eastwards and the other westwards, a short distance intervened of about 24ft. Air had been pumped into the new pipes by the contractors for the purpose of testing, and it only remained to fill in the 24 feet gap with pipes, and to turn on the gas from the main in Howland-street, and to watch the air hole at the other end at Goswell-street, to see when the air had been driven out, and to close up the aperture. It was by some inadvertence at this juncture that the explosion took place. There must in the first place have been a mixture of air and gas in the main of the explosive proportion, or 1 in 15, and secondly, by some carelessness, this must have been ignited. It is said the pressure-gauge gave no indication of such a mixture, nor was any smell of gas perceived; but in the face of such an unparalleled explosion there is some ground for thinking sufficient care had not been exercised. There is always risk in forcing gas into a new pipe where a certain amount of air may be, and a satisfactory answer is now required before the same method can be safely employed again. It is certain the main must have been dangerously charged with gas and air in an explosive condition. Here in the course of half a mile a series of violent explosions, tearing up the roadway and causing a panic of dismay of an unprecedented kind, has happened from some unscientific mode of connection, or some accident. If the former cause, gas-engineers have something yet to learn; if the latter, precautions should be taken to render even a mistake harmless.

It is as well to remember that two conditions are necessary for an explosion of gas, first, the mixture of a certain proportion of gas with the air, and the next, that it be in a confined position. The pipes could not have been full of gas, but of this explosive compound, and when the light was applied, the explosion ran along the main and burst out with increased force at weak points. There ought to be some means of testing the condition of a main, or of forcing the air out more effectively. These are points we hope the pending inquiry will settle; but it still leaves the question we put at the beginning. With the divided jurisdictions under which the metropolis groans, there appears to be no control exercised over the operations of companies, who seem to have the power to open our roadways and to perform work fraught with danger to a whole neighbourhood. At present we suffer a constant breaking up and patching up of the roads. No sooner is a main sewer laid or repaired than the water companies commence a similar operation, and this is repeated by the gas company with an additional amount of risk we have only just experienced. What with sewers, water and gas mains, and tramway lines, the long-suffering public and ratepayer are never exempt from the inconvenience and obstruction created by them; but when to these is added the risk of underground explosions, it seems to us the time has come either for a metropolitan municipality, as proposed, or some other reasonable guarantee of security to life and property.

ST. PAUL'S ECCLESIOLOGISTS AT CANTERBURY.*

THE second session of St. Paul's Ecclesiological Society was crowned and concluded on Saturday last by a day excursion to Canterbury. The visit was one of great interest, the Cathedral, St. Augustine's College, the churches, gates and walls, and other mediæval remains of the city, affording ample and varied subjects for examination. About fifty members of the Society assembled at Victoria-station at 10 a.m., and after a two-and-a-half hours' run by the L. C. and D. line, arrived at Canterbury. Passing through the grounds attached to the conical mound known as the Danejon, and along the High-street, they entered the Cathedral precincts under the Christchurch gateway, built by Prior Goldstone early in the sixteenth century, but greatly defaced by incongruous patchings and repairs. At

THE CATHEDRAL

the visitors were received by the Rev. J. Thomas, D.C.L., vicar of All Hallows, Barking, E.C., and honorary canon of Canterbury, and by Mr. H. G. Austin, the Cathedral surveyor, who conducted them over the minster, pointing out the principal features of interest. Before entering, a halt was made outside the west-front, where were noticed the range of historical statues with which the niches on its lower stages have been filled during the past twenty years; the great seven-light Perpendicular west window and the peculiar, probably unique, one above, consisting of a quatrefoil of triple lights. Attention was called at a later period to the fact that the north-western tower is a modern copy of that on the south side, replacing a fine Norman steeple which was condemned as ruinous forty years since. A comparison of the twin steeples showed the careful imitation of the old work in the new, although the mouldings of the windows are scarcely so vigorous. Entering the cathedral by the rich S.W. porch, the visitors found themselves in the lofty and nobly-proportioned nave; the octagonal pier-clusters of slender shafts, the lierne vaulting, the spacious aisles, the four centred windows with vertical tracery, the wide clerestory extended downwards as panelling so as to form a meagre substitute for a triforium, all told of a Perpendicular reconstruction on Norman lines, more thorough than at Norwich, Gloucester, or Winchester. The whole area is bare, unbroken by the chantries and altar-tombs which give scale and perspective to the contemporary minster naves just alluded to, or even by chairs or benches suggesting practical use, and the masonry, from plinth to vaulting ridge, has a painfully fresh and scraped appearance—an unæsthetic result of over-careful tending to the structure, evident throughout the building, and especially under the fine central lantern. A few monuments are placed against the aisle walls, the most interesting being the tattered colours over the memorial of the Afghan disasters of 1840-1, and the western side-lights are filled with modern stained glass, in one or two of which a light blue tint is too conspicuous. A unique effect is produced in the view eastward from the nave or its aisles by the long flights of steps by which the choir is reached, and by the curious straining arches with rich pierced quatrefoil webbing above, thrown across the western arches of lantern and transepts. The eastern tower-arch is filled in with an elaborately-sculptured 15th-century screen.

Passing out of the cathedral through the south transept, a general view of the south side was gained from the opposite side of the close—of the exquisitely proportioned central tower, which although the most recent feature seems, from the decay of the masonry, to be the most venerable portion; of the double transepts, each with an enriched turret on west side, on the left the nave and western towers, and to the right the curved lines of the choir, with the irregular outline of the Trinity Chapel beyond. Canon Thomas remarked that he wished the members to gain a first impression from this point, because here they could clearly perceive the two parts into which the cathedral was divided—that to the right of the centre tower being substantially the choir as re-erected by William of Sens and English William, using some of Lanfranc's work, of Norman and Transitional character, and that to the left, the nave rebuilt in the Perpendicular period. The original nave occupied the same site, but terminated in a western apse; it was burnt down between 1170 and 1220. They would observe the rich character of the Transitional work, especially in and between the transepts. Further to the right, and placed obliquely to the choir, was Anselm's Chapel, of the same period, but into which a Decorated window, having a rose head of great beauty, had been inserted, and here and there in the eastern part were Perpendicular lights; the whole of that end was raised on high pointed-arches, so as to give internal elevation to the choir. Anselm's Chapel corresponded to St. Andrew's Chapel on north of choir, and both were termed "towers" instead of chapels, by Professor Willis, and by Mr. R. J. King, in Murray's Handbook to the cathedral. A singular effect was produced by the abrupt curving inwards at this point of the choir walls and roof; this contraction in breadth was the result of a wish at the time of the rebuilding in the 12th century to include Anselm's and St. Andrew's chapels within the choir, and to preserve the dimensions of the former eastern chapel, and the narrower part was later in style than the western part of choir. Walking eastwards it would be seen that the Cathedral ended with Becket's Crown, built after the Martyrdom on the site of Trinity Chapel. Above it would be seen the bases and jambs, with their brick backing, of the conical roof intended to be added in the 15th century, but not completed, and forming a rude battlement.

Continuing the circuit of the minster, the visitors came to the ruins of the infirmary-hall and its chapel, here as at Peterborough, Ely, and Norwich, represented by a double range of arches, in this case running parallel to and north and east of the choir. Of the chapel there remain Transitional Norman piers, having capitals freely carved with winged lions, dragons, and grotesque monsters in low relief, and on the north side the tracery of a beautiful three-light Decorated window is left; to the west is the infirmary-hall, of plainer and bolder character, and probably half a century earlier, as testified by the circular-shafts and axed cushion caps. To the east of these are remains of the guesten-house, partially re-built, and modernised. Returning westwards, to the north was seen portions of the refectory, having an oriel supported by four nude female figures carved in oak, as cantilevers, overhanging the flagged passage; opposite, on the south, was the picturesque flight of stone steps leading to the treasury. The visitors still going westward, walked through a dark passage beneath the choir steps into the cloisters; there are eight bays on each side, filled with slender four-light Middle Perpendicular tracery, and enclosing a small garth. The four-centred heads and stilted canopies on the north side were restored a few years since in Caen stone by Mr. Austin, but are already showing signs of decay. In the outer north wall are the heads of Late Norman doorways, of similar character to the eastern part of the church, and a few bases and other fragments remain of Norman work in the cloister. Having spent a few minutes in examining this quiet nook, and admiring the carvings and pinnacles of the central tower which overshadows it, the visitors were conducted into the Chapter-house, a rectangular building, whose obtusely-pitched roof forms a piquant feature of the cathedral buildings as seen from the north. It is of Perpendicular type, and, although the side windows are bricked up, is well lighted from the great east and west windows. The ceiling is Irish oak, covered with a raised fan-vault of complicated character, and very slight in construction, decorated with stars and other devices at the intersections. The gilding, vermilion, and azure, on these ribs and bosses were renewed some years since in an eastern bay as an experiment by Mr. Austin, who explained that he did not continue it on account of the decayed state of the ceiling. At the east end is a triple chair beneath a canopy, brought out a little from the wall; in the centre one the archbishop seats himself at his enthronement, when the clergy swear obedience to him, "with such mental reservation as they deem fit," added Canon Thomas, significantly. On the floor are many slabs to archbishops, mostly illegible, and indeed unrecorded. A stone bench surrounds the walls.

The north-west transept, that of the Martyrdom, was entered from the cloister through a poor Tudor door set into Decorated jambs. Canon Thomas described the Martyrdom of Thomas à Becket, which occurred here in December, 1170, narrating how the Archbishop, with a few monks, ran for refuge here from the palace close by, and was beset on the stairs by three armed knights, while a fourth guarded the entrance of the transept. In the pavement was a small square which was said to have been cut out and sent to Rome, but the story could be traced no further back than the present century. The walls and pavement are probably of Becket's time, although the stairs have been removed. The great window of this transept was the gift of Edward IV. and his Queen, whose portraits were placed on either side of that of Becket. An iconoclast, in 1642, "rattled down proud Becket's glassie bones" with a pike, and the figure of the Queen was unfortunately blown out a few days since, and is now being replaced. One or two of the visitors took advantage of the ladders and scaffolding to ascend to the window, and examine more closely its glass, which is of rich colour, somewhat rough texture, and silvery tone. To the south of this window is the Decorated tomb of Archbishop Peckham, in which is an effigy of Irish oak, which has been figured and described as that Archbishop, but Mr. Austin expressed grave doubts whether it has not been removed from some other place. From the transept, the Dean's or Lady-chapel, built by Prior Goldstone in the middle of the 15th century, was visited. The fan-tracery of roof, the windows, and walls, are covered with a profusion of Late ornament, shallowly carved; it contains a number of Deans' memorials of every type, from the Jacobean effigy to the Classic marble tablet but recently gone out of fashion. Crossing beneath the central tower, with its fine open lantern supported on Perpendicular piers so massy as to suggest a Norman substructure, to the south-west transept, the glass of its great window was examined, and afterwards the Warriors' Chapel, opening on east and corresponding with the Dean's Chapel on north side. It is of Early Perpendicular character, with an elaborate lierne roof, and contains many memorials and some garish modern glass to those who have fallen in war; the central object is a large altar-tomb, on which are the effigies, carved in alabaster, of Margaret Holland and her husbands, one on either side—Somerset and Clarence, the half-brother and second son of Henry IV. Into the east end of the chapel projects, through an aperture, the head of the coffin of Archbishop Langton, whose body when exhumed a few years ago was found to be sewn up in leather.

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* The following illustrations of Canterbury have appeared in the Building News during the past ten years:—Of the Cathedral: ground-plan of conventual buildings of Christ Church, March 3, 1876; cloisters, a drawing by G. N. Stevenson, Sept. 24, 1869, and another by E. Wimbridge, March 4, 1870; staircase to registry, Oct. 18, 1872; pavement in front of Becket's shrine, measured by the late F. L. Deshon, March 1, 1872; tomb of Edward the Black Prince, by F. W. Richardson, Jan. 10, 1876; and the cathedral choir compared with that of Sens, by W. S. Weatherley, June 29, 1877. St. Augustine's monastery without the walls: the gatehouse, Aug. 13th, 1869; ground-plan of conventual buildings, Aug. 20, 1875. The new R. C. Benedictine Abbey, at Hales-place, April 7, 1876.

The party was then conducted round the choir aisles, from south to north. In the south-east transept the work of the three successive architects was seen, in as many forms of Transitional work: the chiselled work of William of Sens built into the axed masonry of Prior Ernulf, and that again completed in lighter style by the English William; and the dog-tooth chevron and zigzag ornaments are used conjointly. In this transept is placed the rude "patriarchal chair" in which the archbishops are enthroned; it is a rude square chair, composed of three slabs of Purbeck marble, and is decorated with patterns of Romanesque character. To the east of this transept is the Decorated tomb of Archbishop Simon de Sudbury, who was beheaded by the Kentish rebels under Wat Tyler. In reply to a query as to whether it was probable that the ghastly dried head shown in a grated aumbry at St. Gregory's Church, Sudbury, Suffolk, was that of the archbishop, Mr. Austin said that he could vouch for the fact that, when the tomb was opened a few years since, the body was found to be headless, a leaden ball supplying the place within the cere-cloth. Having glanced into Anselm's chapel and the watching loft above, the party went into the choir proper. The general effect is very imposing, the only defect being the want of elevation in the vaulting. The shafts of Caen stone alternately round and octagonal are set one behind the other, and have square caps filled with crisp foliage almost Corinthian in type; above are double-shafts in the triforium, and contrasting with these are the Purbeck shafts in the clerestory, and the round and pointed ribs in the vaulting, which seems to have been plastered. The sudden contraction of the eastern portion, the flood of light entering from Becket's Crown, and the great height above the nave are distinctive features of this, the largest choir in England. Mr. Austin remarked upon the false perspective achieved by the architects of this choir, by setting out each bay of the groining from west to east, somewhat narrower than the last, so as to convey to anyone looking forwards from the entrance beneath the return screens, an exaggerated impression of the extreme length. The organ is placed out of sight above the north triforium, and the organist sits, not in the choir, but in a temporary wooden closet in the north choir aisle. A movement is, however, on foot for providing a new and more appropriate instrument, when these arrangements will be changed. The new stalls on the north and south sides were subjected to some criticism; they are kept low, with large carved poppy-heads, have been executed from the designs of the late Sir Gilbert Scott in oak, and replace others in deal of heavy Classic character, said to have been carved by Grinling Gibbons. The return stalls at the west-end are of oak, of the Gibbons period, and are to be left. A Corinthian screen at the east end has been replaced by a reredos of slender, indeed, wiry proportions, filled in with glazing. Behind the stalls is Prior de Estria's screen, constructed in 1304-5, and now glazed between the openings. In the retro-choir between it and the north-east transept is the well-known altar-tomb of Archbishop Chichele, which has just been redecorated in colour and gilding by All Saints' College, Oxford. Occupying a corresponding bay between the pillars on the south side is the yet more celebrated tomb of the Black Prince. On an altar-tomb within a grill is the effigy of the Prince clad in chain mail. Over it hangs a flat canopy of wood, on the under side of which is still to be dimly seen an emblematic painting of the Trinity. This canopy is suspended from a beam, from which also depend the helmet, leather-lined casque, brass gauntlets, velvet surcoat, scabbard, and wooden shield, covered with moulded leather, of the Prince. Having deciphered part of the Norman-French inscriptions upon the upper edge of this tomb, the visitors went into Becket's Crown at the extreme east end of the cathedral, where Mr. Austin described the 13th-century stained-glass, which, although greatly restored in places, is, in quality and quantity, the finest of its period yet existing. In the east window are a series of lozenges and quatrefoils, filled with types and antitypes of Our Lord's Crucifixion, Resurrection, and Ascension, and the Day of Pentecost, in intricate symbolism, drawn from Old and New Testament sources. In the north wall are three windows representing the miracles of St. Thomas à Becket, they give several representations of the archbishop's tomb, feretory, and shrine. The doubled columns separating the Crown from the retro-choir are built in alternate bands of red and white stone. In the retro-choir the place where the shrine stood is marked by a fine mosaic pavement of opus Alexandrinum, upon either side of which are circles of inlaid marbles representing the signs of the Zodiac, while to the east five other large inlaid circles are placed in line north and south. Mr. Austin mentioned that about 37 or 38 years ago the body of Becket was exhumed from this spot, and he believed he was the only person now living who had seen it.

The visit to the Cathedral ended by a descent to the crypt, the southern part of which is walled off for the use of the French Protestant Church, to whom it was granted by Edward VI. The vaulted roof is supported by rude Transitional, circular and octagonal shafts, having richly-sculptured cushion caps. In the south-west portion, Mr. Austin directed notice to a cap, which has been figured by Mr. J. H. Parker in his "Glossary," as a typical example of the way in which the Normans carved their capitals after placing them in position; it is plain on two sides, while on a third a series of cavities and chamfers are cut, and the fourth is carved with interlaced work. In the centre of the crypt is a 15th-century chapel to Our Lady, founded by one Lady Mohun; the sides are screened off, and the roof is still ornamented with stars and a few glistening stones. At the south-east end the Chapel of St. John was opened out some years ago, but in consequence of the injuries inflicted on the frescoes by amateur attempts to revive them with acid, and by tracing from them, it is now closed to the general visitor; by the light of candles the frescoes were seen to depict incidents in the life of St. John the Baptist. On the north side is a small well, which has been almost filled by visitors dropping stones into it. Leaving the crypt by the eastern end, the visitors passed through one of the posterns of the city and cathedral wall, opposite the beautiful Fourteenth-century gateway of

ST. AUGUSTINE'S COLLEGE,

over which building they were conducted by the Rev. E. A. Auger, sub-warden, who stated that the college occupies part of the site of one of the three establishments founded by St. Augustine in the city—viz., the monastery of Christ Church, the cathedral just visited, the little church of St. Martin, and this the great monastery of St. Peter and St. Paul (and, afterwards, of St. Augustine), just without the walls of the city. The latter was founded to provide Christian burial outside the walls of the city, and in time became a great establishment, rivalling that of Christchurch, the monks being relegated here and the secular clergy remaining there. The buildings were splendid, and of great size and importance. After the Dissolution the buildings were converted by Henry VIII. into a palace, and were used by him, by Elizabeth, and so late as Charles I. The "old palace" was divided into holdings, and fell into private hands, those of the St. Legers, the Woottons, and the Hales's, and was finally used as a brewery and tea-garden, when Mr. Beresford Hope purchased it and gave the site and buildings to trustees, to be used as a Missionary College of the Church of England. Under Mr. Butterfield the present buildings were erected. The fine gatehouse through which they had entered had simply been restored. Of the quadrangle in which they were standing the buildings on the west side were chiefly restorations, and consisted of the chapel and hall; on the north side was an entirely new range, used for lodging the students; on the east the workshops followed the foundations of an old undercroft, and above them was the college library; while on the south side were the remains of the great church, and in the centre was a modern conduit-house. The whole of the new buildings are of Decorated character, the details being founded on contemporary buildings in the occupation of the Archbishops. The sub-warden conducted the party over the college buildings, beginning with the chapel, the nave (the ancient portion) of which is Early English, and the new chancel of two bays is Decorated, and from thence on the same first floor to the college hall—till 1844 used as a free-and-easy—where, under a modern ceiling was found a good timber roof, which has been strengthened and opened out; the students take all their meals in this room, which is hung with portraits of the founders and an old view of the monastery buildings. Before the Dissolution these apartments formed the chapel and guest-hall of the monastery, so that there is a fitness in their present use. In the basement was seen a small room, said to have been the "dungeon." It is lighted only by a narrow splayed opening in the thick south wall, and till the present door was made by Mr. Butterfield, the sole approach was through a trapdoor in the ceiling; at present it forms a larder. The range of apartments on the north is of two stories, with open corridor in front, each student's lodging comprising two very small rooms, opening into each other, and furnished in Spartan simplicity, with bed, chair, desk, cupboard, and bookcase. In the groined basement on east are the workshops, where as many of the students as possible are taught carpentry, and above is a well-furnished library. All the piers of this range rest on old concrete foundations formed *in situ*. On returning to the quadrangle, the sub-warder sketched the history of the college, remarking that this, one of the two oldest establishments of Christian England, was reconsecrated to its new use by Archbishop Sumner in 1848. Between 270 and 300 missionaries had been sent out from the college, and there were during the term about 50 students on the books. It was probable that this great quadrangle was never seen by the monks in the pre-Reformation days, for this was the Great Court, the buildings of the monastery being on the east, those on the west now utilised having been the ones devoted to hospitality by the abbot. The grand tower of St. Ethelbert was standing a century since, almost complete; it was partly taken down in 1793 by 200 workmen, only one side being left, and in October, 1822, on account of supposed peril to the County Hospital just outside the walls, it was decided to demolish it—a work only effected with great difficulty. Part of the south and west walls and the south-east wall of this tower, and the springers of the great arch still remain. Of the north aisle of nave six bays remain with traces of Transitional and Later masonry. At the north-west angle of college quadrangle is a 14th-century moulded arch, now filled in, and on either side the bases, for columns of Purbeck marble, set in pairs. This seems to have led into the forensic parlour, above which was probably the abbot's chapel. The corbels and other traces remain of the wooden roof of a cloister, and in the wall is a square opening, supposed to have communicated with the cellarer's room. The sub-warden mentioned that some years since some pipes were found to the north of these remains, which led to the lavatory. They were strips of lead roughly beaten into a circular form, and were now preserved in the museum.

ST. MARTIN'S CHURCH

formed the last portion of a long day's programme, and was shown by Canon Routledge, who explained that although the church had a history extending back to the days of St. Augustine, it had so often been rebuilt that little existed of earlier date than the 13th century. The north side was entirely reconstructed, and the whole much altered by the last rector, and at the present time little by little the present custodians were endeavouring to undo his work as funds permitted. The church consists of a chancel, nave, and western tower, and in the older walls a good many Roman bricks from the Via, which passes it on the south, are reused. On this side of nave is a half-round buttress, of rude character, and to the east of it a small circular brick head to priest's door, like archways at Brixworth and other Saxon churches. The font is almost unique; it is a cylinder of marble in two pieces, each covered with separate and interlaced rings in low relief, the lower portion being somewhat ruder, and earlier Norman in character than that above. There is a very perfect Norman piscina, a 14th-century stone coffin in a recess, and in the chancel a large Jacobean monument to Lord Fordwich. A Norman reredos, and some stained glass by Heaton and Butler, were put up at the east end as a memorial to St. Augustine 18 months since.

The members then separated into sections, visiting the remains of Christ Church Priory, and including the well-known stairs to registry, now forming the entrance to grammar-school, and the Green Courtyard-gate, both of rich Norman character; the massive 14th-century towers of Archbishop Sudbury, at Westgate, and the remains of several ancient hospitals.

The visit to Canterbury was extended over Sunday, about half the members remaining. After table d'hote breakfast, the party walked under the leadership of Mr. E. J. Wells, to Chartham Church, a fine cruciform structure, with very rich choir of Edward I., and containing in the nave windows good examples of Kentish tracery. The piscinæ of these altars and several brasses are in good preservation. The church has been restored by Mr. Street. The party then took train to Minster, the mother church of the Isle of Thanet. It was restored a few years since under Mr. Arthur Ashpitel, who died during the progress of the work. The nave is Late Norman in character, and was probably built in sections, the dogtooth being introduced in the north side, but not on the south. Modern flying buttresses support the vaulting. At Sandwich was seen the hospital church of St. Bartholomew, partially restored under the late Sir Gilbert Scott; it is Norman, with many later additions. At St. Clements, in the same town, the enriched Norman tower, formerly the centre of a cruciform structure, attracted most attention. The altar-stone retains the five crosses; and there is a hagioscope on north side of church chancel-arch. The last church visited was St. Peter's, where the aisles are wider than the nave. The tower fell a few years since, destroying the south aisle, which is now in ruins, although the steeple has been meanly rebuilt in brick. On leaving Sandwich the party divided, some going on to Dover and others to Richborough, while the larger number returned to Canterbury on foot, visiting, *en route*, the churches of Ash, made famous by the late J. R. Planché's exhaustive monograph, "A Corner of Kent," and Patrixbourne, containing much Norman work.

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MR. NEWTON ON GREEK PAINTING.

MR. NEWTON'S eighth lecture on Ancient Greek Art treated of Greek Painting, for the history of which, the lecturer said, the evidence was of a very slender kind. If we passed over the few traditions about Greek painters in the archaic period of art, the first name of note was that of Polygnotus, who flourished between the end of the Persian war and the beginning of the Peloponnesian war. At Delphi he adorned the walls of the great hall called the Lesche with two great compositions, the Taking of Troy and the Descent of Ulysses into Hades. Pausanias had left us a very full description of these, giving the names of all the figures represented, and the order in which they were arranged. We must suppose the more distant figures placed above the others, not exactly in parallel lines, but in groups disposed with a certain tendency to horizontal regularity. There was in such compositions no attempt to render aërial perspective. The sources which inspired Polygnotus in great compositions were the "Iliad" and "Odyssey" and the Cyclic poets. He painted also great historical pictures at Athens in conjunction with Mycon and Panænos. Several attempts had been made to recompose the designs of Polygnotus at Delphi by the aid of the description in Pausanias, but such attempts, however ingenious, could only be regarded as pure speculations. With regard to the merits of Polygnotus as a painter, our best guide was the authority of Aristotle, who, living in the full maturity of Greek painting as developed by a succession of great masters from Zeuxis to Apelles, emphatically held up Polygnotus for the study of youth as being beyond all others the ethographer or painter of noble character (*ethos*). In thus distinguishing Polygnotus, Aristotle contrasted him with Zeuxis, whose paintings he considered deficient in that quality of *ethos* which was so conspicuous in Polygnotus. In the period immediately following painting was still further developed by Apollodorus, who made the first essays in chiaroscuro, which were followed up with more brilliant results by Zeuxis, who, to use Pliny's expression, entered the door which Apollodorus had opened. Zeuxis painted a celebrated picture of Helen for the city of Croton, in Lower Italy. Parrhasius, a contemporary of Zeuxis, carried the art still further. He appeared from Pliny's statement to have succeeded in bringing out his figures in strong relief by the skill with which the contours were rendered. Neither Zeuxis nor Parrhasius appeared to have painted great historical compositions like those of Polygnotus, but rather isolated groups or single figures. Among the most conspicuous names which are found in Pliny's list was that of Pamphilus, who established a school at Sicyon, where he taught drawing on scientific principles; his scholars, who paid very large fees, drew on boxwood. Pausias, a scholar of Pamphilus, invented encaustic painting, which enabled him to obtain finer and deeper gradations of colour as modified by chiaroscuro. He was thus enabled to accomplish very bold foreshortenings. In one of his pictures an ox was so presented in a front view that the whole length of the animal was suggested. The successive improvements of art developed by these masters led to a power of expression which showed itself in the choice of dramatic incidents, to portray which it was necessary to render transient emotions. Such subjects were the dying mother still suckling her child in the picture by Aristides of the Taking of a City, and the Sacrifice of Iphigeneia, by Timanthes, in which the grief of Agamemnon was expressed by the expedient of veiling his face. Apelles, after having had the benefit of the teaching of Pamphilus and of the study of the great masterpieces of his predecessors, attained an eminence which entitled him, in the judgment of antiquity, to the highest rank as a painter. He did not appear to have been distinguished for his skill in complicated compositions of many figures; but the grace and charm of his pictures, the harmony of his colouring, and his wonderful mastery over all technical difficulties were qualities in which he had no rival. He was the Court-painter of Alexander the Great, as Lysippus was his sculptor, and they alone among contemporary artists had the privilege of taking his portrait. Among the most celebrated works of Apelles were his "Alexander wielding the Thunderbolt" and his "Aphrodite rising from the Sea." A contemporary of Apelles, who, through that great master's generous notice, rose suddenly from comparative obscurity into fame, was Protogenes of Rhodes, a painter who, like Leonardo da Vinci, finished painfully and elaborately, attaining thus a perfection which excited the admiration of Apelles, but led him to utter those warning words which had since become a proverb—*manum de tabula*. Protogenes appeared to have painted very few pictures. His two most celebrated works were his "Ialysus" and his "Satyr in repose." After the reign of Alexander there were many Greek painters, but of these no name was very prominent, except that of Timomachus, who lived at some time in the Hellenistic period and who painted a Medea and an Ajax. Painting in the Hellenistic period had an idyllic tendency, with more or less of landscape in combination with some mythic incident or a scene from real life; it had also a tendency towards *genre*. Examples of idyllic subjects and *genre* abounded in the paintings at Pompeii, where we might also see in the decoration of walls the very style which Vitruvius described and objected to. The lecturer then explained a number of diagrams illustrating the progress of painting from extant examples, among which may be mentioned a figure drawn in an archaic style on an Athenian sepulchral *stelè*. This curious example of early drawing is probably of not later date than B.C. 500. A figure of an athlete jumping is engraved on a bronze disc in the British Museum—date probably about the time of Polygnotus. A fragment drawn on boxwood formed part of a casket found in a tomb near Kertch. The composition engraved on the Ficoroni bronze cista represented Amycus, King of the Bebryces, slain by Pollux. The mosaic found at Pompeii depicted Alexander and Darius at the battle of Issos. There was also a scene representing Niobe, Latona, and their companions drawn on marble, found at Herculaneum. A Roman mosaic represented a battle between a Centaur and wild beasts. Lastly, there was a Pompeian painting of Venus fishing.

◆

THE NEW THEATRE ROYAL, DUBLIN.

THE old theatre was destroyed by fire in February last. Almost immediately after the fire Mr. Michael Gunn, the proprietor, sent for Mr. C. J. Phipps, F.S.A. (who had some ten years ago successfully constructed for him the Gaiety Theatre at Dublin), and gave him instructions to design a theatre which would be a worthy successor of the National Theatre of Ireland. The drawings and designs are now complete, and, in addition, Mr. Phipps has prepared a large model of the interior of the theatre, exactly as it will appear, completely decorated.

The dress circle holds, with private boxes	400
The upper circle	400
The orchestra and pit stalls, and pit	1,300
The gallery	1 300
Making the total number	3,400

Which is about 500 more than the old theatre could contain.

The width of the proscenium opening is 33ft., and the stage is 72ft. wide between the walls, with a depth of 65ft. Extending on either side of the stage walls are scene docks, which will make the available width of the stage for special purposes 110ft. Running the whole length of either wing, outside the main building, are several floors of rooms for all the multitudinous requirements of the theatre—green-rooms, manager's and treasury offices, property-making shops, wardrobes, tailors' and dressmakers' rooms, and dressing-rooms for actors, actresses, ballet, supers, &c. There is a height above the stage floor to the gridiron from which the scenes are worked of 65ft.

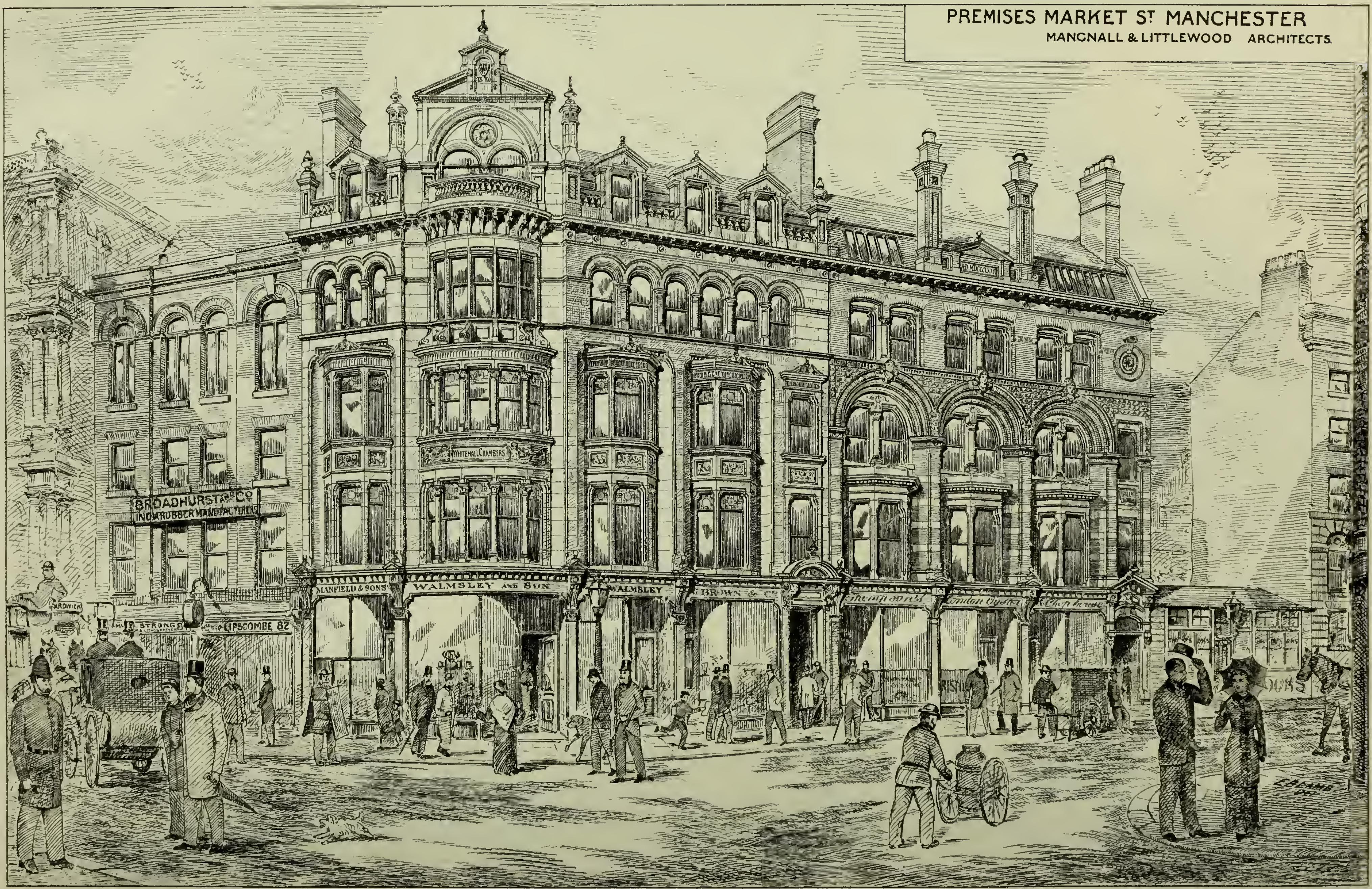
Some other dimensions may be given to show the relative size of the new theatre:—

Curtain line to front of dress circle			51ft.
Ditto	ditto	upper circle	54ft.
Ditto	ditto	gallery	57ft.
Ditto	ditto	back wall inside corridor of pit	78ft.
Height of ceiling above pit-floor in centre			68ft.

The style of the exterior elevation is Italian, and the purpose of the building is distinctly shown by the design. No one would mistake it for anything but a grand opera-house—and it has quite a Continental character about it. Estimates for the new building are now in progress of preparation, and in the course of a week or so tenders from builders will be invited. The building will, the architect believes, be ready to open by the early autumn of 1881.

◆

Mr. G. Shrewsbury, of the Old Bailey and Buxton, has sent us a copy of his catalogue of gas conservatory boilers, hot-water apparatus, gas-baths, stoves, &c. It is full of illustrations of ingenious arrangements in various branches, and its author's long experience and reputation are sufficient guarantees of his ability to supply the requirements of any reader in want of such apparatus.



PREMISES MARKET ST MANCHESTER

MANGNALL & LITTLEWOOD ARCHITECTS.

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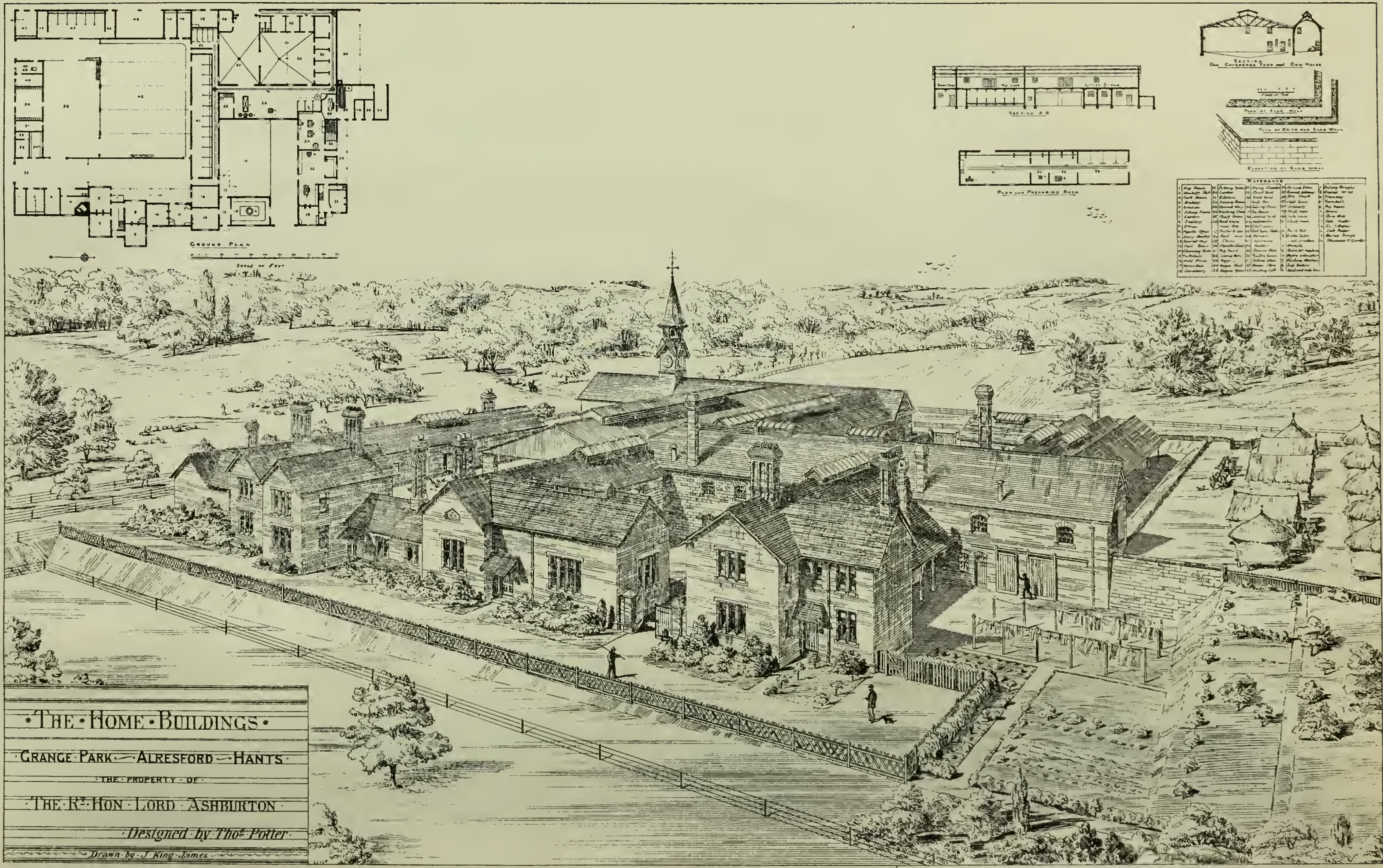
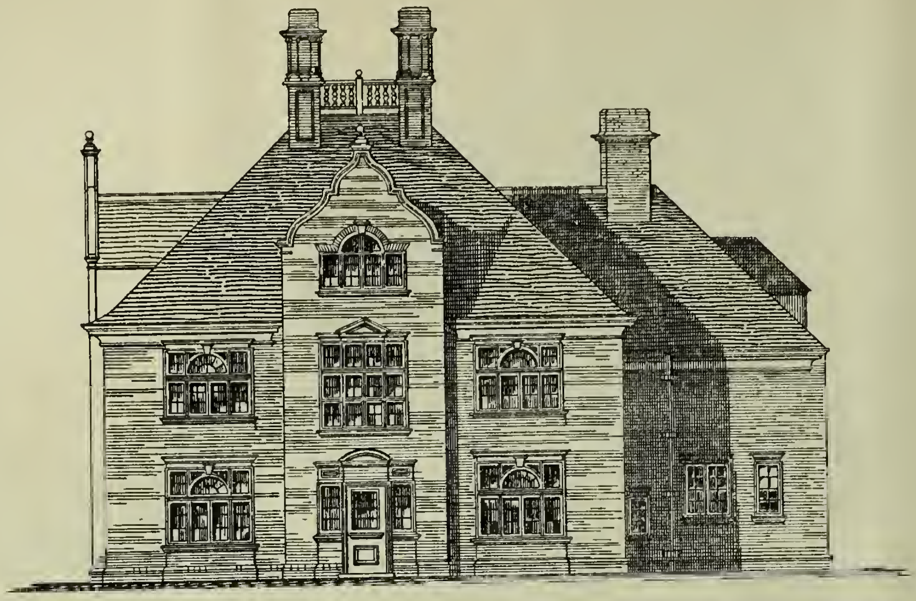
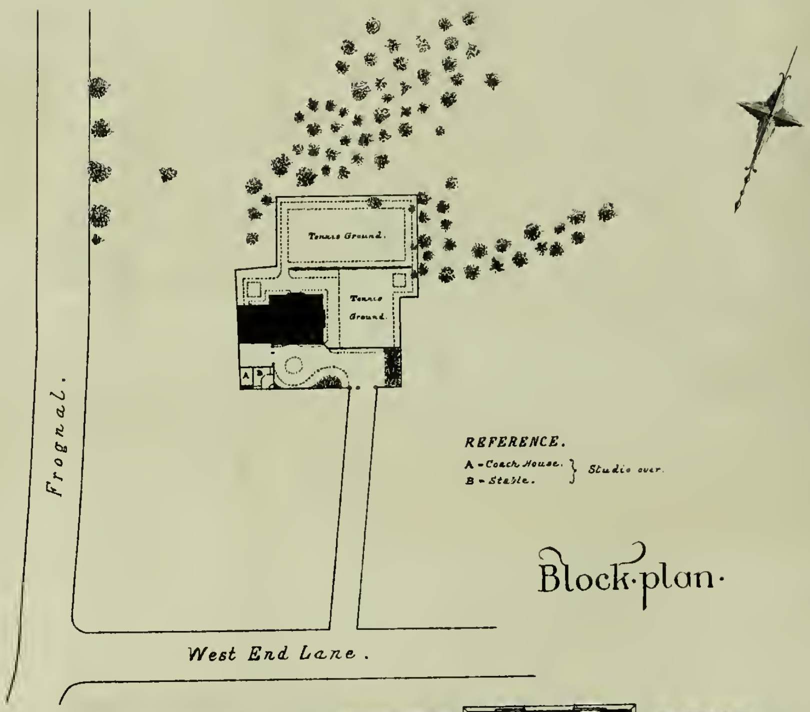


·THE·HOME·BUILDINGS·
·GRANGE·PARK·—ALRESFORD·—HANTS·
·THE·PROPERTY·OF·
·THE·R^T·HON·LORD·ASHBURTON·
·Designed·by·Tho^s·Potter·
Drawn·by·J·King·James

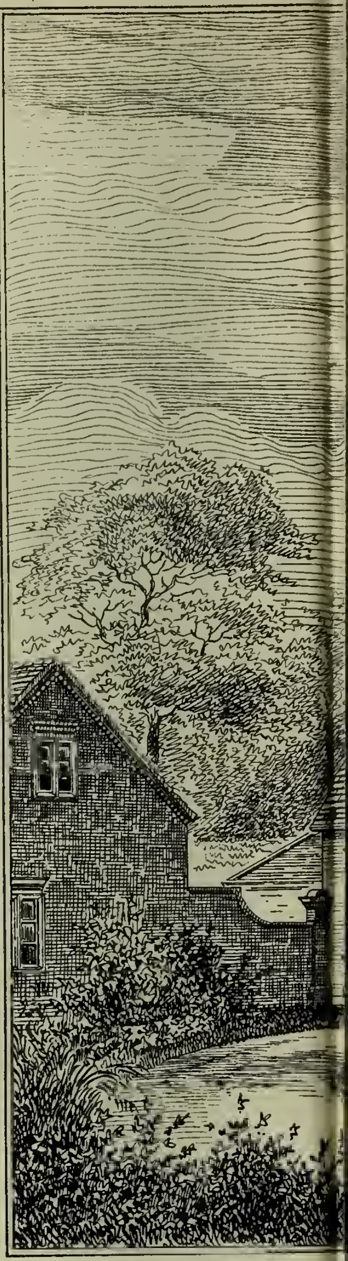
Photo Lithographed & Printed by James Akerman, 6 Queen Square W.C.

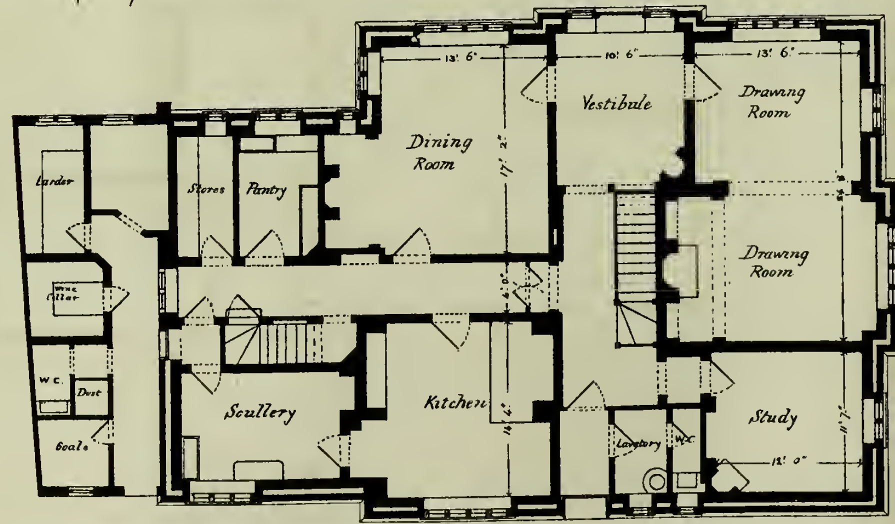


S·E· or · Garden · Front ·

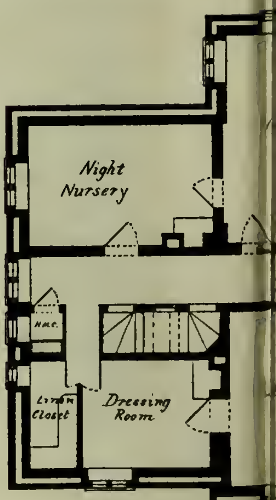


Block·plan·





Ground·plan·



First

Scale · of ·

Artist's · Homes · No 5 · Mr Basil Champneys' House "Manor Farm".

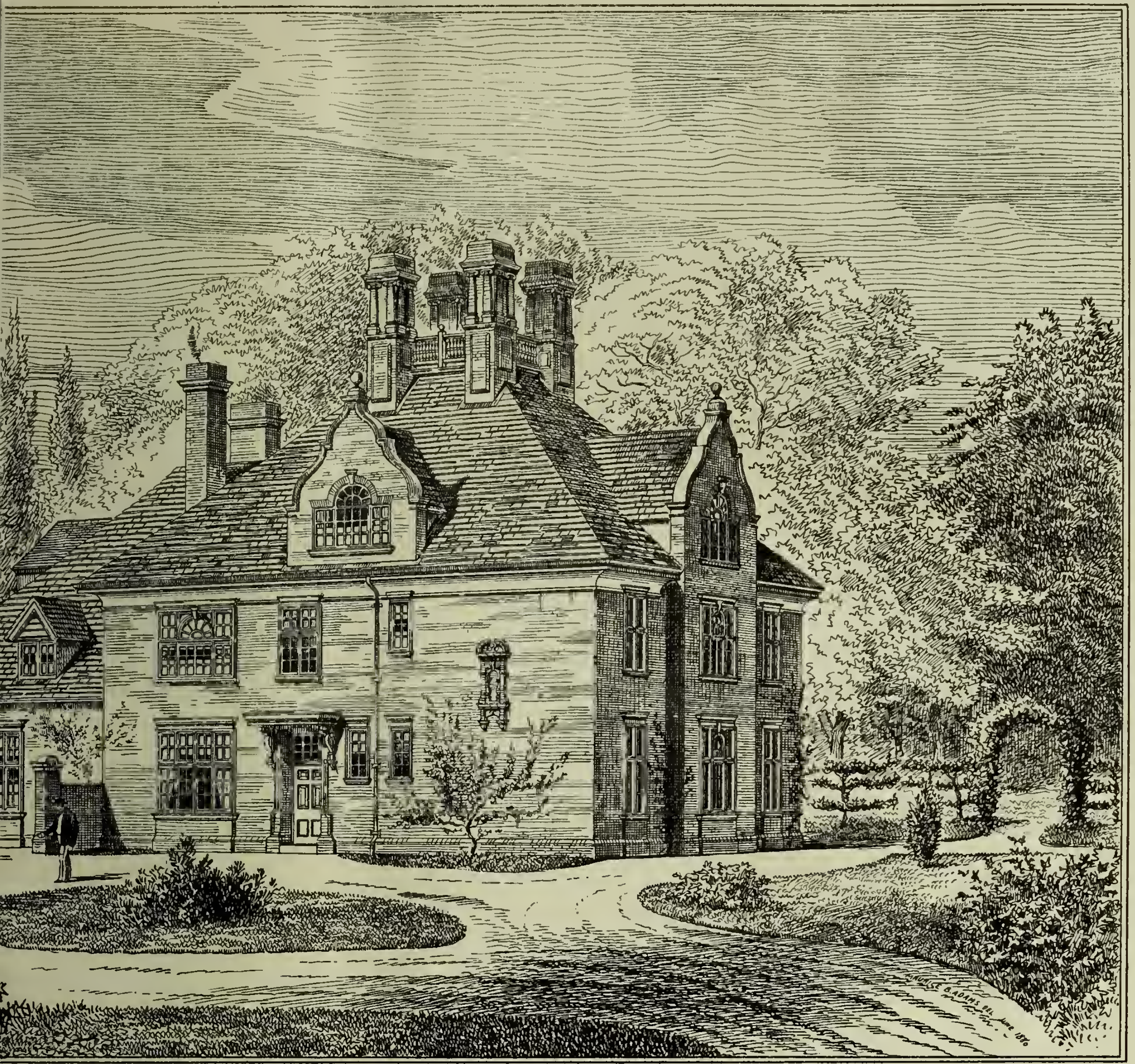
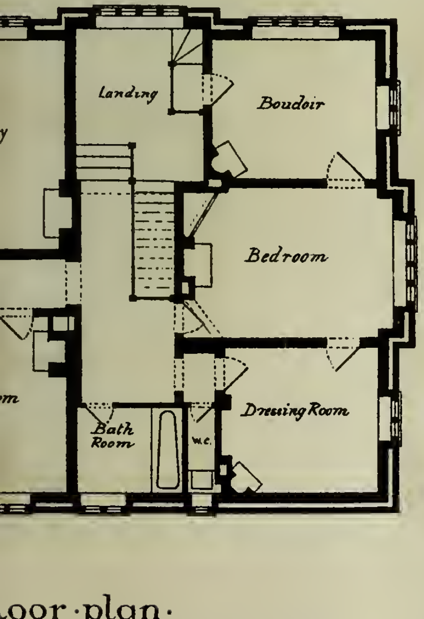
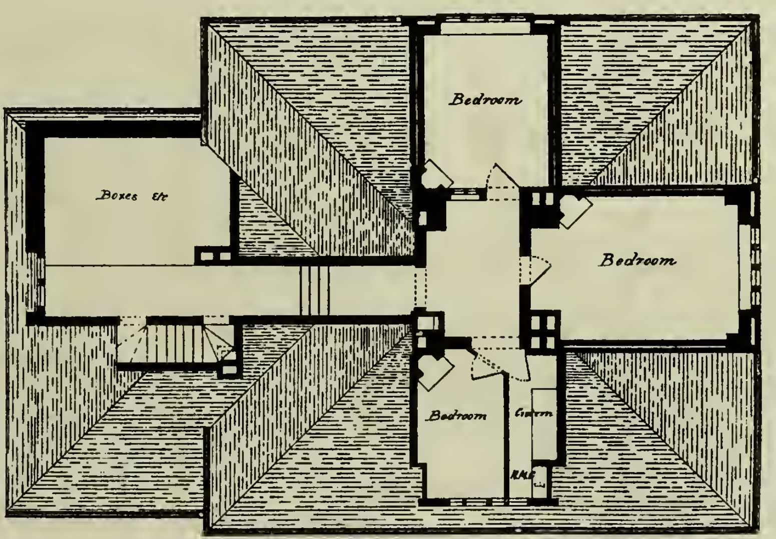

MAURICE B. ADAMS DEL. June 1880

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

View · of · the · Entrance · Front ·





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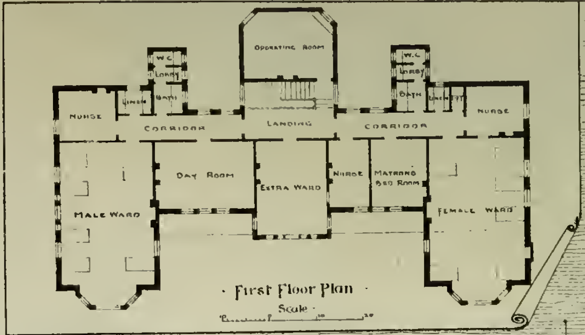
Attic · Plan

Feet

AMPSTEAD ·

BASIL · CHAMPNEYS, ARCHITECT.

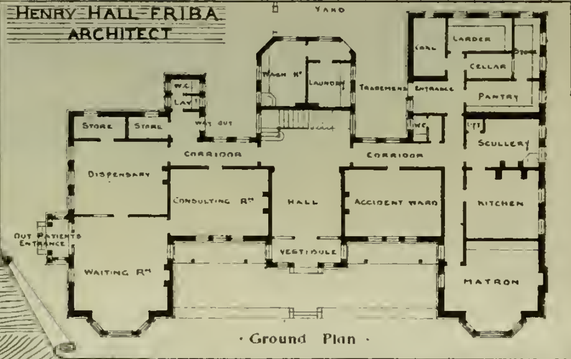


· First Floor Plan ·

Scale ·

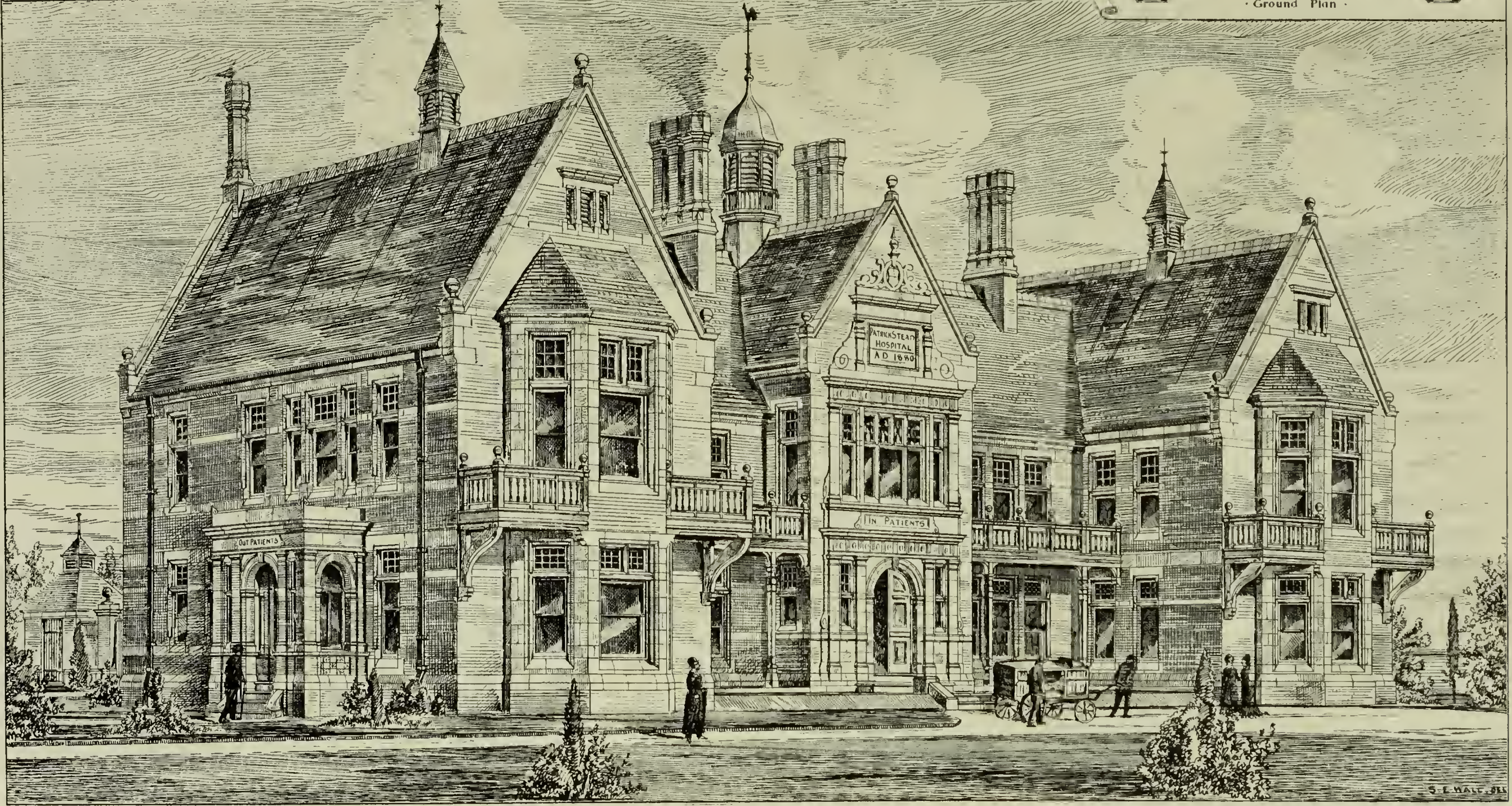
Patrick Stead Hospital

Halesworth



HENRY HALL F.R.I.B.A.
ARCHITECT

· Ground Plan ·



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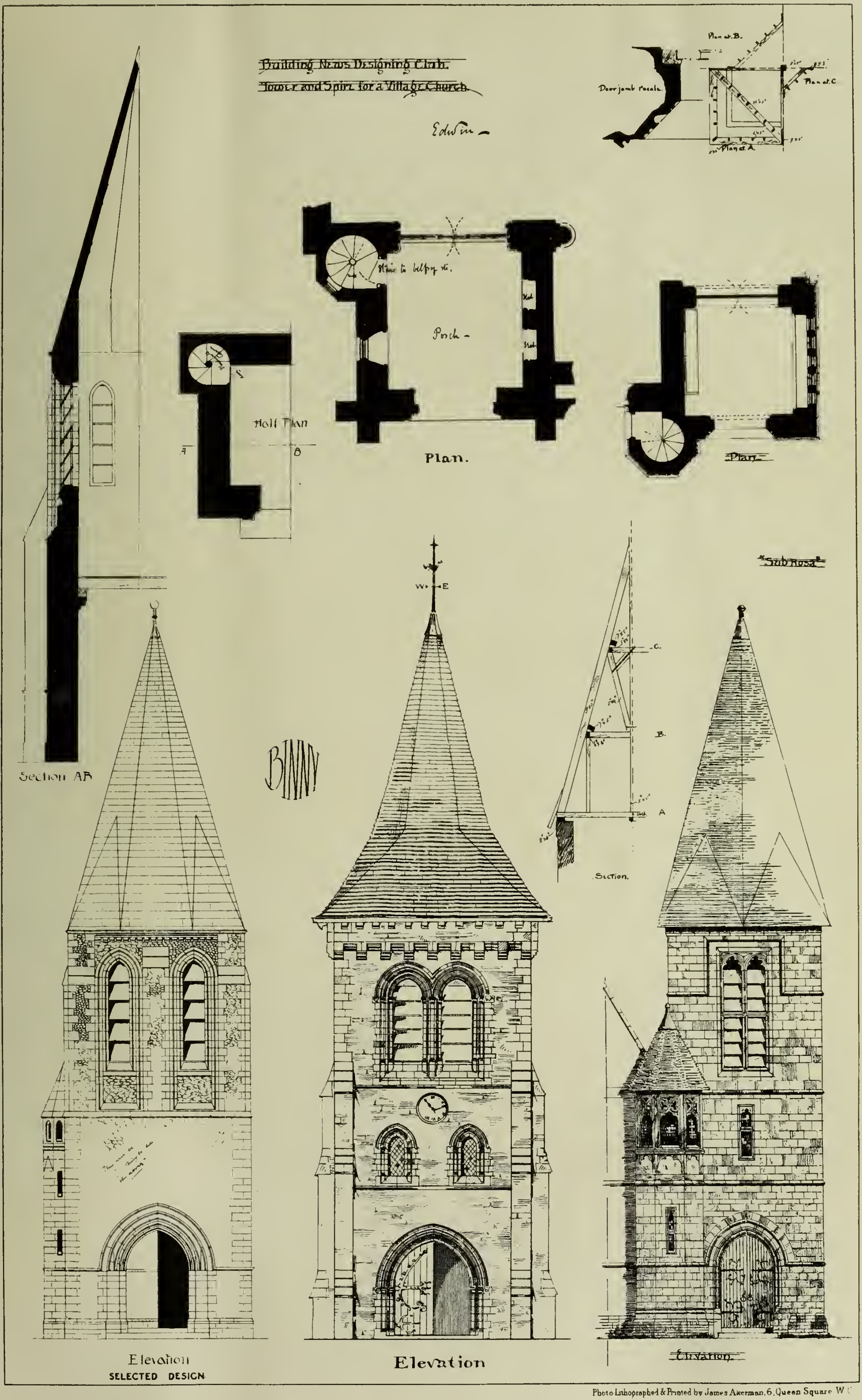
Building News Designing Club.
Tower and Spire for a Village Church.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.

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ILLUSTRATIONS.

ARTISTS' HOMES: NO. 5, MR. BASIL CHAMPNEYS' HOUSE, MANOR FARM, HAMPSTEAD. — THE HOME BUILDINGS, GRANGE PARK, ALRESFORD. — THE PATRICK STEAD HOSPITAL, HALESWORTH.—DESIGN FOR VILLAGE CHURCH TOWER AND SPIRE.—PREMISES, MARKET-STREET, MANCHESTER.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES: NO. 5—MR. CHAMPNEYS' HOUSE, HAMPSTEAD.

MR. BASIL CHAMPNEYS' own house, which is now in course of erection, forms the subject to-day of our Artists' Homes' illustration. In the planning of the house, the principal point observed by the architect has been an endeavour to follow the lines of houses erected during the last two centuries in making a continuous passage through the house, showing the garden beyond, and forming a vestibule which can be to some extent used as a room communicating with the garden-grounds. Here this vestibule or garden-room is divided from the staircase-hall by a double-arched opening, one of which openings communicates with a useful cupboard for tennis balls, bats, &c., next the fire-place and under the stairs. In the dining-room the main parallelogram has been made serviceable to the fullest extent for table and chairs by the removal of the fire-place into a cosy recess instead of allowing it to project into the apartment in the more usual way, obstructing the room and diminishing the otherwise available space. A somewhat analogous arrangement appears in the drawing-room, which is a fine apartment 24ft. 8in. long by 14ft. wide, divided into two compartments by an arched-opening, similar to that which spaces off the "Inglenook" fireplace, which is arranged ample enough for sitting in. A third sitting-room, as a study, is planned near the entrance-hall, and the kitchen with offices are nicely arranged on the N.E. side of the house. The plans readily show the building throughout, and thus leave little more here requiring description, while the elevation of the S.E., or garden front, and perspective view of the entrance elevation, complete our illustrations, in company with a general block-plan of the site and its surroundings. The main walls of the house are hollow in construction, having 4½in. outside and 9in. inside, the space between being 6in., which unusual width is purposely arranged to give sufficient depth for the shutters to the windows, and thus prevent their projection into the room. In many of Mr. Champneys' buildings it has been observed that much point is made of the symmetrical planning of the chimneys, and the present occasion will illustrate a conspicuous instance of this rule. The idea is that all chimney-stacks should be kept within the outer walls and inside the house, for the better retention of all the fire-heat possible, and to prevent a tendency to smoke, which all-external-built flues have in a more or less degree. From an artistic point of view it certainly may fairly be described as an anomaly that when the general design of a house suggests a studied symmetry, that the chimneys, the most important features in the sky line, should crop up at haphazard, as it were, as if their existence or distribution were not of the least importance. Here at "Manor Farm" four boldly-designed chimney-stacks in cut brickwork form a central feature from every point of view, and enclose a Belvedere balcony from which the beauties of the prospect may be enjoyed, and this arrangement of the chimney-stacks is arrived at by legitimate construction, and without the use of iron in any way. The materials used are red bricks for the walls, the cramps in the hollow parts being of galvanised iron. The roofs are covered with tiles, and the woodwork outside, like the cornice cove, is painted a dead white. The builders are Messrs. Bell and Sons, of Cambridge and Saffron Walden. A studio or office is arranged over the stables, seen on the left-hand side of our view, and the kitchen yard is cut off from the entrance garden by a brick wall and gates as shown.

THE HOME BUILDINGS, GRANGE-PARK.

THE home buildings in the Grange Park, Alresford, comprise the usual erections of a home farm, dairy and cowhouse, and offices required in connection therewith, a bakery, bacon-curing and smoking-chambers, bailiff's house and stables, a steam-laundry and dwelling-house for laundry workers, and agent's and bailiff's offices. A 12 horse-power fixed engine and Cornish boiler provides power for driving chaff-cutter, root-pulper, corn-mill, cake-breaker, &c., as well as for the washing machinery; also steam for cooking cattle-food, and for heating the drying-chamber, besides boiling water for laundry purposes, thus avoiding the danger and trouble of independent fires. Tramways and turntables throughout the buildings, where necessary, lessen the labour required for distributing cattle-food. The natural ground rising abruptly towards the north-west is taken advantage of, in constructing the food-loft over preparing-room, by making the floor level with the bed or bottom of ordinary farm-waggons, so that corn &c., can be unloaded into a tram-truck out of the waggons, and taken where required with the least possible amount of labour. The cow-yard, measuring 82ft. by 62ft., is covered by a single-span iron roof. The floors over stables, &c., are of concrete on iron girders. The milk-room fittings are of polished Sicilian marble, with a fountain in the middle of the room; the walls are lined with Minton's glazed tiles, and the floor with encaustic tiles. Owing to the uneven nature of the site and surrounding land, a very large amount of excavation was necessary, about 17,000 cubic yards of soil having to be removed for buildings and approach roads. Water is distributed over the various parts of the buildings, by a service of pipes, from a large tank, the latter being supplied from an Artesian well about a mile distant, and forced up to the tank by pumps, worked by a water-wheel. Bell's telephone connects the laundry and mansion (about half a mile apart), and forms a portion of a system of telephonic communication with other buildings on the estate; the telephone was completed while the buildings were in progress, and was used regularly in communicating with the estate building-yard, a mile distant, for materials required and other matters. The walls are constructed of Portland cement concrete encased with concrete slabs, both concrete and slabs being made principally from the old bricks and débris contained in the old farm-buildings which the new ones are built to replace. The walls looking towards the park are, however, faced with red brick and Portland stone dressings, with concrete slabs inside, and a core of concrete between the two. The external walls, generally, are 12in., and the internal walls 9in. thick, and are of great strength compared with ordinary brickwork of similar thickness. The total cost of buildings, including preparation of plans and superintendence, steam-machinery, farm-machinery, roads, fences, fittings, and working plant complete in all respects to constitute them a going concern, was about £13,700; the sub-division of which was as follows:—The roads, fences, levelling for site, formation of paths, gardens, and grass slopes, the steam-engine, boilers, shafting, belts, farm-machinery, tramways, turntables, laundry machinery, dairy-fittings, wall-linings, and encaustic tile floors, and all fittings for live stock, and fixtures throughout the buildings, £5,600. The building, including plans and superintendence and water-supply, £8,100. The roof area of the building measures 24,000 superficial feet. The covered yards contain 111,000, and the inclosed buildings 329,000 cubic feet of space. The low cost of construction is accounted for in a large measure by reason of the unusual facilities that existed for obtaining the concrete materials, and the estate workshops and sawmills being near at hand, while the whole of the buildings, the ground-work, and formation of roads and approaches were executed by the estate workmen. Messrs. F. W. Reynolds and Co. supplied the iron roofs. The whole of the work was designed and the erection superintended by Mr. Thomas Potter, of Alresford. The Grange is the seat of the Right Hon. Lord Ashburton, and Captain Caldwell, of Candover House, Alresford, is agent for the estate.

PATRICK STEAD HOSPITAL, HALESWORTH.

THIS illustration shows the design accepted in an open competition for the above hospital. Mr. H. K. Colling was appointed referee, his recommendation being accepted by the trustees. The instructions required a dispensary for out-patients, and an accident-ward on the ground-floor, with the kitchen and necessary offices, and on the first floor a ward with six beds for male, and a ward with six beds for female patients, with an extra ward for special cases; a convalescent or day-room, nurses' rooms, matron and servants' bedrooms, and an operating room. A lodge and mortuary are also provided. The plans attached show the disposition of the several rooms and wards. Mr. Henry Hall, F.R.I.B.A., is the author of the design, and the trustees have instructed him to carry out the work.

"BUILDING NEWS" DESIGNING CLUB.—TOWER AND SPIRE FOR A VILLAGE CHURCH.

WE give to-day illustrations of the three best designs which were submitted by the members of our Designing Club, for a Tower and Spire for a Village Church. The chosen design by "Binny" is unquestionably the most suitable. "Sub-Rosa's" design, shown third on our sheet, being second in the competition; and "Edwin," in the centre of the page, was marked as third. The plans arranged over the elevations with the sections on our sheet, refer to the designs adjoining. We are glad, on the present occasion, to be able thus to publish the chosen designs side by side.

PREMISES, MARKET-STREET, MANCHESTER.

THESE premises are situated at the corner of Market-street and Spring-gardens, Manchester, and form two distinct blocks of buildings. The corner block is recently completed, and belongs to G. B. Withington, Esq.; it will be occupied on ground-floor for shops, the superstructure being let off for suites of offices, with a general entrance to Spring-gardens. The elevation is of Yorkshire stone, designed in Free Italian, the principal object in view being an abundance of light, which is found so essential in town-buildings. The first and second-pair floors have bay windows, which are obtained by splaying the main piers, and without projecting beyond the building-line, or otherwise infringing the Corporation by-laws. Grey granite is used to the pilasters to ground-floor, offices, entrance, and shafts to corner circular windows. The block to Spring-gardens has been erected about a year. It belongs to Messrs. Withington, Petty, and Boutflower, solicitors, and is occupied by them as offices, excepting the ground and basement floors, which are appropriated by Thompson's oyster-rooms. This elevation is built of purpose-made stock-bricks and stone dressings, the details of which are treated in a similar manner to the other. The whole has been erected under the superintendence of Messrs. Mangnall and Littlewoods, architects, Manchester; Messrs. R. Neill and Sons being the contractors.

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At the Derbyshire quarter sessions on Tuesday week, the sum of £1,700 was voted for the erection of the workshops, &c., at the county lunatic-asylum, near Mickleover, from designs and under the superintendence of Mr. J. S. Story, the county surveyor.

A Local Government Board Inquiry was held at the Tol-house, Great Yarmouth, on Friday, before Mr. R. Morgan, C.E., inspector, respecting an application from the town council for sanction of a loan of £850 for sanitary purposes.

PRESERVING WOOD.

TO a German technical journal, Privy Councillor Funk has contributed a valuable paper on the results of some experiments in preserving sleepers on the German and Austrian railways. The methods employed for impregnating the sleepers are well known, and the substances used were chloride of zinc, sulphate of copper, corrosive sublimate, and creasote. The latter is commonly used in this country, and from the manner of carrying out the process it becomes rather expensive. Herr Funk gives a table of the cost for oak, beech, and fir sleepers, from which it appears that the chloride of zinc is cheaper than the other preservatives, but costs more for beech than for either fir or oak. As compared with creasote, the only thing that gives an equal degree of durability, chloride of zinc is about one-third the price, and the effect of impregnation is to bring fir sleepers into practical equality with the more costly woods. The life of sleepers, both impregnated and unimpregnated, depends largely upon the nature of the timber, and the manner in which the timber is treated before being made into sleepers, and the nature of the ballast in which the sleepers are laid; but by dealing with large numbers of sleepers employed under different conditions a fair idea can be obtained of the value of preservative processes. According to Herr Funk the average life of unimpregnated sleepers on German and Austrian railways up to the present time has been as follows: oak, 13·6; fir, 7·2; pine, 5·1; beech, 3·0 years.

On the same lines the average lives of sleepers properly treated and impregnated with chloride of zinc or creasote under heavy pressure have been: oak, 19·5; fir, 14 to 16; pine, 8 to 10; beech, 15 to 18 years.

The prolongation of the life of the beech sleepers by impregnation is remarkable. Herr Funk adds that the average life of 831,341 pine sleepers impregnated on various systems, and used on thirteen German railways, was fourteen years.

Timber felled in winter is found to make more durable sleepers than that felled in summer, but what difference there is is less marked in the impregnated sleepers than in those made of unprepared wood.

◆

BIRMINGHAM CORPORATION AND THE EMPLOYMENT OF ARCHITECTS.

THE Town Council of the borough of Birmingham, at their meeting on Tuesday, had a long and animated discussion on the question of the appointment of an architect to the corporation. The subject came up on a resolution, moved by Mr. Alderman Heeton, in the following terms:—"That the General Purposes Committee be instructed to inquire into the desirability, or otherwise, of appointing an architect, who should undertake the whole of the Corporation work, except on such occasions when it may be deemed desirable to invite the assistance of professional gentlemen having special qualifications for what may be required. And with a view of enabling the Council to come to a decision on the matter, that the committee report the amount of architects' commissions that have been paid for the various works during the last five years, and the probable liabilities for architects' commission upon contracts now in course of execution." He contended that there was a considerable amount of public dissatisfaction with the system which had hitherto obtained of employing one firm of architects only, without resorting to competition. By taking this course, and paying the usual commission of 5 per cent., it was felt that they were really paying retail prices for wholesale orders. The resolution was seconded by Mr. Brinsley. Mr. Cook then moved the following amendment:—"That the General Purposes Committee be instructed to consider the present system of obtaining plans and estimates for the erection of buildings for the Corporation, and to report whether it is desirable that any change should be made in such system by the appointment of a borough architect or otherwise," which was seconded by Alderman Kendrick, who expressed the view that the various committees should have power to select for themselves an architect to carry out such work as they might desire to have executed. He objected to the appointment of a borough architect. Alderman Collings, M.P., had no objection to vote for the amendment, but thought it would not be for the good of the public service if the existing system were altered. Mr. M. Davis said there was unquestionably a good deal of dissatisfaction in the town as to the council giving all the work of the town to Messrs. Martin and Chamberlain. They had, no doubt, done their work well; but why should they enjoy a monopoly of the public work of the town? Alderman Biggs remarked that the Corporation for the last five or six years had been paying about £2,000 or £3,000 to architects, and he thought they could well afford to pay an accomplished architect—a man of good reputation—£1,000 or £1,200 a year, and be £1,000 a year the gainer. He did not say this question should be settled without some consideration, and he was willing that the matter should be well considered by the General Purposes Committee. After some further discussion, Mr. Cook ultimately consented to insert in his amendment after the words "that the General Purposes Committee be instructed to consider" the words "and report upon," and this alteration having been accepted by Alderman Heeton, the latter withdrew his resolution, and Mr. Cook's proposal was carried unanimously.

◆

ROYAL ACADEMY ADMISSIONS.

July 6, 1880.

1st Class Students.

E. J. M. Allen.
G. H. Coldwell.
C. W. Davies.
F. W. Kite.
F. C. Lees.
W. J. Millard.
E. C. Shearman.
L. Stokes.
W. H. Wood.

2nd Class Students.

A. M. Calderon.
C. T. Fagg.
J. B. Gass.
A. Keen.
W. F. Keen.
W. R. Lethaby.
E. A. Ram.
B. A. Raves.
E. W. Smith.
J. D. Wheeler.
C. C. Wilson.

Probationers.

W. T. Allen.
H. R. Best.
C. Burton.
J. C. Carter.
R. M. Gruggen.
A. Hemingway.
E. W. Jennings.
J. N. Johnston.
W. E. Lloyd Jones.
E. Nevinson.
J. F. Newton.
F. Simpson.
E. J. Slow.
P. Thicknesse.
G. W. Winchester.

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PLANS IN PENCIL.

A LAUDABLE desire to get designs cheaply, with a minimum of trouble to the competing architects, is actuating the School Board of the Borough of Jedburgh at the present time. We reproduce the advertisement without charge:—

PLANS OF NEW SCHOOL BUILDINGS WANTED.—The SCHOOL BOARD of the BURGH of JEDBURGH have resolved to BUILD a NEW SCHOOL and OFFICES on the site of the present Buildings, for which the Board invite Architects to furnish Plans, in Pencil only, on or before the 31st inst. The Plans must provide for all the requirements of the Education Department.

The Plan only that is acted on will be paid for. Further information had from J. M'Dougall, Jedburgh.

We don't quite understand the expression "acted on" in the last paragraph. An uncomfortable suspicion haunts us that the plans are wanted "in pencil only," for greater convenience in adaptation should it occur to the professional adviser of the School Board, if there is one, that the good points of two or three of the best designs can be incorporated in the one finally selected. At any rate, we suggest that each competitor should send a small piece of india-rubber attached to his "plan in pencil only," as an earnest of his complete willingness to be rubbed out or inked in at the discretion of this most economical and considerate Scotch School Board.

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COMPETITIONS.

O'Brien Orphanage Competition.—An eccentric lady named O'Brien, having died some years ago, bequeathed a considerable sum to the late Cardinal Cullen for the foundation of an orphanage for middle-class children. Shortly before his death, the Cardinal acquired for the purposes of the charity the estate of the Earls of Charlemont, at Marino Clontarf, a short distance from Dublin, on the Howth-road. The death of the Cardinal, and other circumstances, prevented any steps being taken to give effect to the will until the spring of this year, when the present Archbishop of Dublin, the Most Rev. Dr. M'Cabe, invited seven Dublin architects to submit plans in competition for the proposed orphanage, the conditions being that the plans should be sent in under motto, the author of the first selected to have the carrying out of the work at the usual fee of 5 per cent. on the outlay; the second and third to be awarded £50 each. The orphanage to be planned to accommodate 100 boys, and a community of six who were to have charge of the Institution. The building to contain school and class-rooms, study halls, dormitories, lecture-hall, and chapel, the total cost not to exceed £15,000. The design "Truth" obtained first place, "In hoc signo vinces" second, and "William of Wykeham" third, the authors being J. J. O'Callaghan, John L. Robinson, and William Hague, respectively. The unsuccessful competitors were J. C. Ashlin, O'Neil, O'Brien, J. J. MacCarthy, and Charles Geoghegan.

Sheffield.—Designs are invited for a new font for the parish-church, Sheffield, about to be presented by the Freemasons of the town. Intending competitors are to apply for particulars to Mr. Ensor Drury, 24, George-street, Sheffield. No premium is offered in the notice inviting designs.

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More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office · 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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To American Subscribers.—Mr. W. L. Macauley, of 23, Dey-st., New York City, is authorised to receive subscriptions for the Building News. Annual rates, 6 dols. 40c., gold.

Cases for binding the half-yearly volumes, 2s. each.

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"BUILDING NEWS" DESIGNING CLUB.

Drawings Received. — Hubert, Pupil J., Burswell, Jack in Circle, Hasherjeg, Edwin.

Correspondence.

THE CLEOPATRA NEEDLE.

To the Editor of the Building News.

Sir,—Your correspondent "R. C." is right. "They have done it at last," and stultified a genuine monument by farcical adjuncts in the same *style* (?)

Picturesquely and admirably placed the obelisk is, in spite of the adverse opinion of Sir Frederick Leighton. But it should have been treated as a jewel in a rich and sumptuous setting, not placed baldly upon a mean cold pedestal, to which it could not seem to belong; and not flanked by sham antiques, which its very presence must proclaim to be impostures.

The Romans, who placed crabs at its angles to clasp it, had a better notion of how to deal with it than the designers of the stilted "buskins," which now certainly do vulgarise it, as your correspondent points out. The princely generosity of Erasmus Wilson in bringing us the needle has been ill-seconded. The work to be done afterwards was one that should be done well; it should have been intrusted to someone of proved ability, and not been allowed to be slurred over by an official department.—I am, &c., S.

July 2, 1880.

BELL MEASUREMENTS.

Sir,—During a short stay at Hindringham, I have availed myself of an opportunity of measuring the bells in the parish-church, which is noted hereabouts for its fine tower. The bells are five in number; the treble is dated on the waist 1770. It is 21½in. in height, exclusive of the canons, and 25½in. across. There has been some inscription round it which has been chiselled off; I fancied I could read the remains of the words "John Marsh." Local tradition affirms this bell to have been purchased in 1809, which date is incised on the bell-cage. The remaining bells are all of one set, and bear the same date, 1636. No. 2 has round it, just below the shoulder, in three groups, at equal distances apart, the letters I B, I D, and the date 1636. It is 26in. high, and 30in. across. No. 3 bears similar marks, and measures 26½in. high, and 32½in. across. No. 4 has the same inscription, and is 29in. high, and 36in. across. The tenor is 32in. high, and 39in. across; it is a beautifully-shaped bell, and bears the following inscription in Longobardic characters—"Tuba ad juditium campana ad eclesiam 1636 I B." All the old bells are much worn, and appear to have never been turned.

At Little Snoring, distance about three miles from this village, the curious old church has just been placed in the builder's hands for the rebuilding of the chancel, and for thorough repair. Now I learn that this builder is his own architect, and I trust that some local antiquarian will keep his eye on the restorations, as the church of Little Snoring is one of the most interesting in the country. It has a circular tower which stands about 8ft. away from the south wall of the nave, near the porch at its western end. The arched entrance into the church is distinctly of Norman Transitional work, and the tower may be, as is generally stated, of Saxon workmanship.

This village is capitally situated for the study of a fine group of Perpendicular churches, nearly a dozen of which may be reached within the limits of a comfortable walk.—I am, &c.,

Gilbert R. Redgrave.

Hindringham, near Walsingham, July 5.

GLASGOW MUNICIPAL BUILDING.

Sir,—In reference to the above there was a paragraph in one of the Glasgow papers, in which the writer, after enumerating the number of designs sent in, &c., goes on to state the following, viz.:—"Several architects sent in copies of reports on their plans, accompanied in some cases by photographs of the designs, requesting the same to be *circulated among the members of Council*," but which request, I am glad to say, the town clerk was instructed not to comply with. I think, Sir, we cannot bring occurrences such as these, in connection with competitions, too often before the notice of your readers.

I would also observe, with much satisfaction, the very wise course the Council intend to follow of calling in a professional adviser of high standing to report on the designs, aiding, as it does, the object of the memorial lately sent up to the R.I.B.A., on this subject of architectural competitions.

I am sure the majority of your readers will agree with me when I say such a professional referee should always be called in to adjudicate on designs sent in competition.—I am, &c.,

Reform.

IRON FILINGS IN PORTLAND CEMENT.

Sir,—I read with some curiosity the letter in last Building News by "Magnet."

He finds metallic iron in Portland cement by different makers.

I shall be happy to make the acquaintance of those makers who can afford to introduce that article into their manufacture. "Magnet," perhaps, would not like to publish the names of those gentlemen; but I should be glad to correspond with him if he will empower you to send me his address.—I am, &c.,

Electro-Magnet.

Sir,—I willingly respond to "Magnet's" wish for further information.

It matters not from what source the ground iron came, for I have no doubt that its presence in the cement was due to accident. It may indicate a carelessness on the part of the cement-maker; but when you consider the source from which they get their fuel, the presence of bolts or nuts, &c., is not to be wondered at. The gas-works people do not undertake to purify the coke from the numerous pieces of iron with which it is too frequently associated, and, unfortunately, the cement-maker accepts it without challenge. The whole passes through the kiln, and in its passage becomes so much like the "clinker" that its presence is unobserved until it reaches the millstones, which, owing to the modern preliminary practice of crushing, involves a closer relationship between the runner and the bed-stone. Pieces of iron get into the now limited "swallow" of the stones, and are gradually reduced, and may be operated upon for days even, producing during that time a large amount of fine iron dust. At last, the larger pieces get between the stones, and the miller must then become aware of their presence, for he must assist their passage by raising the lever of the "runner." I would be very much surprised indeed to find such quantities of iron in any sample passing through my hands; but if I encountered it, I would attribute its presence to the cause or causes I have named.

I repeat that iron, of the character in question, should not seriously prejudice the test, and I should not hesitate to use the cement in which it was found (of course, I mean that the proportion of ground iron should be of such moderate extent as I would expect to find from the causes I have named) for ordinary purposes, if it stood a tensile strain of 750lb. per 2¼ square inches, at the end of seven days. That is, however, a very moderate breaking strain for a really good cement.

In my last book ("Concrete"), I have endeavoured to show the advantage of using a finely-ground cement, and it was in reference to this point that I presumed to hint that "Magnet" courted the failure in his experiment. Although my touch is still acute, I would rather trust to the sieve, and I am sure if your correspondent had prefaced his examination by that test, he would at once have encountered the iron; for the pieces are comparatively large, four of the biggest weighing about half a gramme, while their size (surface) averages upwards of ¼in.

"Magnet" should give further particulars of the cement, although I do not wish him to name the makers; but an appeal to them might result in some clearer and more definite explanation than that the challenged article was a "patent iron cement."

The presence of iron, in a combined condition, in cement produces a weak and imperfectly-coloured cement, quick in initial set, but incapable of ultimate profitable induration.—I am, &c.,

Henry Reid.

ENGLISH HOMESTEADS.

Sir,—With regard to Mr. Ingress Bell's article in the *Magazine of Art* concerning the demolition of our English homesteads, and his suggestions that some memorials of them should be preserved, surely there are many who would gladly contribute sketches and notes which they may have of these interesting specimens of domestic work, and a sufficient number of subscribers could be got together for their publication. I might suggest that there are many smaller examples of the same class scattered among our villages that have been entirely ignored. Their stamped-plaster gables, quaint dormers and chimneys, rough and coarse as they often are with regard to detail, display a bold originality in grouping and outline, the spirit of which some of our foremost architects strive to grasp. Who were the architects of these quaint old "pubs" and homesteads? Whoever they were, they seem to have adapted their design most happily to the materials and the capacity of the workmen around them. It is in these works alone that the Gothic spirit seems to have lingered through the seventeenth and eighteenth centuries. They are decreasing in number daily; a collection of these picturesque remains would be valuable to many, both for their antiquarian interest and their artistic points.—I am, &c.,

Charles L. Bell.

Cambridge.

THE ARCHITECTURAL DICTIONARY.

Sir,—The first number of this book came out when I was a young man and a bachelor: my grandson is now a promising youth. I am anxious to know whether there is any possibility of it being finished in his time, as I think there is but little chance of myself or my sons possessing the complete work. Perhaps some of your readers may be in the secret.—I am, &c.,

Ancient.

ST. MARY'S FRAMPTON, LINCOLNSHIRE.

Sir,—I read with interest, in your last issue, the letter, relative to the above, signed "Safety." There does not exist a more beautiful typical Early tower and spire in England, and it is a sad thing to think that, for the want of proper attention, they are slowly but surely tending towards their destruction. It is doubtful whether Gloucester, Worcester, Ely, and Chichester could have been preserved, but we know prompt action saved us Hereford, Wells, Salisbury, and Canterbury. In the case of Frampton, the whole might easily be made secure by careful and judicious treatment, unless things have got much worse since last year.

Your correspondent does not allude to the interior of the church, which presented a curious medley, and I believe the state is still the same. The nave has double and single rows of square deal pews, many of the floors of which are rotten. The chancel-seats, also square, are of the meanest. A quasi-gallery, having the wreck of a *barrel*-organ for its centre adornment, blocks up the south transept. In front of the chancel-screen is placed a stove, the chimney of which is held in position by wires attached at intervals to the screen. Coals are shot at the west end of the south aisle. The remains of an arcaded Transitional font are propped on wedges of stone. Flimsy stained deal roofs to the chancel and transept, about twenty years old, suggest local skill. A large brass chandelier, dated 1722, of 30 branches, suspended from the nave-roof, has this inscription:—"The gift of Coney Tuunard Gent for an example to all pretenders of love to the Church which by their acts don't shew it." Quaint lines, apparently disregarded.—I am, &c.,

G. R. W.

LEGAL INTELLIGENCE.

Auctioneers' Licenses.—A person named Stock appeared at Lambeth Police-court, on Wednesday, to an adjourned summons, taken out against him by the Excise authorities, for having painted up the word "Auctioneer" over his premises, he not being duly licensed. For the defence it was urged that hundreds of persons all over the country put up the word auctioneer without holding a licence, and the magistrate was referred to the immense number of advertisements in newspapers where parties used the term and yet were not licensed. It was contended that no licence was requisite for the use of the word unless the party exercised or carried on the business. Mr. Ellison, after a long argument, said he was of opinion the statute intended to include all who professed to carry on the business, and to limit to those who took out a licence the power of using the word. He must, therefore, convict the defendant, and ordered him to pay a fine of 10s. and 2s. costs. He agreed to grant a case.

District Surveyors' Fees.—At the Marlborough-street Police-court on Thursday, the 1st inst., before Mr. Mansfield, Mr. Alfred Stonor, of 61, South-street, Grosvenor-square, appeared to an adjourned summons taken out by Mr. Robert Kerr, district surveyor of St. James's, under the Metropolitan Building Act, to recover the fee of £1 15s. Mr. J. A. Alsop, solicitor, appeared for the defendant. Mr. Kerr said the defendant had executed some works at 18, St. James's-place. Those works included the fixing of some hot-water apparatus. By the Building Act, section 21, paragraph 4, it was provided that no pipe for carrying hot water should be placed nearer than 3in. to any combustible material. Mr. Stonor had in this case fitted the pipes nearer than 3in. to woodwork. Witness communicated with him about the violation of the Act, and he promised to amend the work; and he ultimately did so to witness's satisfaction. Witness then sent in his claim for his fee, which Mr. Stonor had neglected to pay; hence this summons. Mr. Alsop: Mr. Stonor gave you no notice of this work? Witness: No. Mr. Alsop: Therefore, if the work came under the Act, he would have been liable to a penalty? Witness: He would. Mr. Alsop: Why did you not proceed for those penalties? Witness: Because I am not in the habit of proceeding for them. Mr. Alsop: Did you survey the work? Witness: I did. Mr. Alsop: When? Witness: One visit was on the 14th Nov., 1879. Mr. Alsop: Although the work was completed on the 18th Sept.? Witness: It was not completed then. Mr. Alsop: Do you swear that you went there at all until long after the work had been completed? Witness: The work not having been notified to me at the time, I went there when I became aware of it. Cross-examination continued: Mr. Stonor has disputed this claim since November last. He said his client would not pay it. I have another claim pending against him in respect of the Eton and Harrow Club, which he also disputes, as not coming within the Building Act. By the magistrate (Mr. Mansfield): I inspected the works myself, and gave directions for their alteration, which were obeyed by Mr. Stonor, as he admits in a letter which I produce. Wm. James Ashdown deposed: I am clerk to Mr. Kerr. I remember water-pipes being put in at 18, St. James's-place. The chimney was opened and altered, and a stove was fixed. That work was surveyed by me and by Mr. Kerr on several occasions. I remember seeing Mr. Stonor on the matter. He admitted having done the work, and corrected it to Mr. Kerr's satisfaction. Mr. Kerr: Are you aware that there has been considerable difficulty experienced in administering that clause of the Act which requires all pipes conveying hot water to stand 3in. away from the woodwork? Witness: Yes. Mr. Kerr: And are you aware of the custom that prevails and of my practice to allow woodwork which is not in absolute contact with the pipes but yet within 3in., to be covered with metal? Witness: Yes; that is the practice. Mr. Kerr: And did that practice guide the negotiations and arrangements which were made with Mr. Stonor? Witness: Yes, and I calculated the fees. Mr. Kerr: Mr. Stonor gave us no notice and no particulars on which to calculate the fee, and my clerk had therefore to do it in the best way he could. Witness, in cross-examination, said the surveyor's fee, according to the second rule of the Act, was calculated by the size of the building undergoing alteration. This completed the complainant's case. Mr. Alsop, for the defence, took several technical objections to the summons, all of which the magistrate overruled. He then went into the merits of the case, contending that by the 9th section of the Building Act, 18 and 19 Vic., such work as that executed by Mr. Stonor in this case was excepted. The words were "Any alteration, or addition, or other work made or done for any purpose, *except that of necessary repair not affecting the construction of any external or party-wall* in or upon any old building." Now, he believed, and he would call evidence to prove, that Mr. Stonor's case came within that exception. He also called his worship's attention to the fact that although the work was completed about the middle of September, it was not until November that Mr. Kerr interfered or attempted to have anything to do with it. Mr. Stonor did not give notice of the work because he felt satisfied it did not come within the works which under the Act the district surveyor was entitled to survey and to charge for. If Mr. Kerr had really believed in his claim he should have brought it before the court earlier. The fact was, that these claims were being continually made and then abandoned because it was known the cases did not come within the Act. Various witnesses having been heard, and Mr. Kerr having addressed the magistrate at some length, Mr. Mansfield said: I am of opinion that Mr. Kerr might have proceeded for penalties against Mr. Stonor or whoever put up those pipes for their not being three inches from the wood, but I utterly repudiate the doctrine that if I make a repair I am bound to repair with the same material as the original; that if, for instance, a thing was made of cast iron, I could not, in repairing it, use some other material for the same purpose without rendering myself liable to the Act. It is absurd to say, if I put in a stone instead of a brick in the wall, that is not a repair; therefore I dismiss the summons.

In the case of Kerr *v.* Barron and Wilson, also heard before Mr. Mansfield, the district surveyor of St. James's claimed £5 for the inspection of work done by the defendants at the Conservative Clubhouse, the work in question consisting of the removal of a stove from one part of a room to another, and the carrying of the stove-pipe through the wall into the extremity of the flue. It was work, Mr. Kerr contended, which properly came under his supervision, the building being a very important one, and no mercy would have been shown to the district surveyor if fire had resulted from his neglect to see the work properly done. The fee he was entitled to under the Act was £5. In these cases of large fees he was always open to receive applications for abatement, but in this case no such application had been made to him. The solicitor for the defence contended that the case did not come within the Act at all, or that if it did it came under section 50 as being work for which, not being covered by the schedule, the district surveyor was bound to apply to the Board of Works to fix the amount of his fee. It was monstrous to contend that this mere alteration of a stove-pipe and flue came under sections 20 and 21, and entitled the district surveyor to a fee half as large as he would be entitled to for the entire building of the Conservative club-house. Mr. Mansfield rather agreed that the sum claimed was exorbitant, as the work was much slighter than some of the works specified in the schedule as entitling the district surveyor to a fee of only ten shillings. At the same time he believed that under section 9 Mr. Kerr was entitled to claim the £5, and he was bound to give judgment accordingly.

PARLIAMENTARY NOTES.

Decoration of the Central Hall of the Houses.—Mr. Schreiber, last week, asked the First Commissioner of Works when he intended to complete the mural decoration of the central hall of the Houses; whether he was in possession of designs for the three vacant panels, and at what cost each panel could be filled in with mosaics. Mr. Adam:—The question as to the best mode of filling in the vacant panels in the central hall has given rise to much discussion, and was very fully inquired into in 1870 and 1871, but no definite conclusion was arrived at. I am of opinion that the vacant spaces should be filled up, but I am unable, without further consideration, to state when this can be done. No designs exist for the vacant panels. The cost of the panel already filled in was about £675, but I am unable at present to say what will be the cost of filling in the vacant panels.

The Lighting of the House.—In answer to Mr. D. Grant, Mr. Adam said: The question of lighting the House and its approaches by the electric light has received, and is receiving, careful consideration. I will take care that it continues to receive full attention, but I am not prepared at present to recommend any definite course of action on so important a question, involving much change and alteration of existing arrangements, and which ought not to be finally adopted without going through the test of careful experiment.

The National Gallery.—Mr. Coope asked the First Commissioner of Works whether he was able to lay upon the table of the House the resolutions adopted by the trustees of the National Gallery as to giving increased facility for admission to the public; and whether he was prepared to state what action the Government was willing to take in the matter. Mr. Adam.—The copy of the resolutions passed by the trustees of the National Gallery and their remarks explanatory of them have been laid upon the table of the House, and will shortly be printed. The initiative in this matter rests with the trustees, and not with the Government; but the latter will be prepared to consider any proposals that may be made to them on the subject, with the view of giving, if possible, increased facilities to the public and students.

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At the Turin National Fine Art Exhibition now being held, the highest attainable honour, viz., the "Grand Diploma of Honour," has been conferred on the Venice and Murano Glass and Mosaic Company, of 30, St. James's-street, London, and 731, Campo San Vio, Grand Canal, Venice. At Paris, in 1878, the company received two gold medals, and the Cross of Legion d'Honneur. A new process invented and discovered by Signor Alessandro Castellani, whereby exquisite impressions of the most antique medals and coins may be preserved in glass, will, doubtless, interest all who have studied numismatics.

In our description, last week, of the house at Westgate-on-Sea, of which we gave an illustration, we omitted to state that the facing bricks were manufactured by Mr. Thomas Lawrence, of Brackwell. Mr. Lawrence also supplied the facing bricks for the house at Sunninghill, recently illustrated, and he is also supplying the whole of the bricks for Mr. Holloway's Ladies' College, now being built at Epsom, his contract being for 20,000,000 of bricks to be sent in in four years.

Our Office Table.

The first anniversary of the Sanitary Institute of Great Britain was held yesterday (Thursday) afternoon at the Royal Institution. Earl Shaftesbury, vice-president, occupied the chair. The annual report having been read, received, and adopted, Captain Douglas Galton, C.B., delivered an address on "Some Preventible Causes of Impurity in London Air." Statistics as to density of population and average death-rate were adduced, and shown to establish the theory that in proportion as there is more complete circulation of air around dwellings so is the healthfulness of the inmates increased. The greater unhealthiness of town over rural districts is largely due, it was urged, to the too close proximity of dwellings, the consequent absence of circulation of air, and the saturation of the subsoil with impurities passing into it from the closely occupied surface. The contamination of the soil by decaying animal matter is diminished in London by the careful surface paving and good drainage, but there is still much room for improvement in scavenging. But the oppressive character of London air is probably largely due to the enormous consumption of coal. Open fireplaces, with all their advantages in cheerfulness and direct change of air in an apartment, are wasteful and smoke-producers, and he recommended in preference the use of hot-water and steam-pipes, care being taken to warm the room indirectly through the walls and floor, and to make ample provision for ventilation. Something might be done also by storing up heat either in felt-lined boxes, as in the Norwegian stove, or by utilising the heat evolved in the crystallisation of acetate of soda, now being adopted by the London and North-Western Railway Co., in their foot-warmers. Earl Shaftesbury, in proposing a vote of thanks to Captain Galton, asked him to moderate his zeal against the open fire, a peculiarly English institution, typical of home comfort, and urged that it was of little use instructing engineers and architects—although of the latter he must say they seemed to him to know as little of drainage and ventilation as of the moon—unless the general public were educated in the principles of sanitation.

Messrs. Richard and George Tangye have made a munificent proposal, in the hope of promoting the erection of a permanent building for the Birmingham Corporation Art Gallery. Messrs. Tangye now make the following offer:—That if the Council will agree to make provision for a permanent art gallery, on a scale really commensurate with the necessities of Birmingham, they will, on the resolution of the Council to commence the work, pay over to the Free Libraries Committee a sum of £5,000 for the purchase of specimens of art for exhibition in the gallery; and further, that if this contribution is met by adequate donations—say of equal amount—from other persons, they will give a further sum of £5,000, making £10,000 in all, for the above-named purpose. Birmingham has always behaved with regard to science and art in a manner which shames many towns with greater advantages, and we have no doubt Messrs. Tangye's liberal offer will be met in a correspondingly liberal spirit.

Following the example of last year, an Exhibition of Ecclesiastical Art will take place at Leicester during the forthcoming Church Congress, at the Skating Rink, in Rutland-street, which will be specially fitted up and decorated for the occasion. The Exhibition will open on the 27th of September, and close on the 2nd of October. Many of the leading ecclesiastical art manufacturers have already intimated their intention of being represented, and owing to the central situation of the town, the Exhibition may be expected to rival, if not surpass, that held at Swansea in 1879. An important feature of the Exhibition will be a loan collection of ancient church plate, mediæval silversmiths' work, embroidery, and similar objects, towards which some well-known collectors will contribute. A portion of the building will be placed at the disposal of the principal Church Societies for their publications, and a room will be provided for the use of the secretary or representative, who will be in constant attendance to give personal information and counsel to those interested in the work of the particular society. The Exhibition will include educational books and appliances of every description.

THE BUILDING NEWS.

LONDON, FRIDAY JULY 16, 1880.

ARCHITECTURAL IMPROVEMENTS IN THE CITY.

MANY people traversing that busy focus of City life are unaware that the little steeple seen at the back of the Mansion House, rising out of a mass of obscure buildings, belongs to a church which is considered to be Wren's masterpiece. Not many, perhaps, are aware that the little church, whose side is hidden partly by an old book-store, is St. Stephen's, Wallbrook, and that it contains one of the most ingenious and admirable architectural interiors in existence. Probably fewer still have ever had the curiosity to enter a building which, externally, is so destitute of pretensions, either to size or dignity; but of all the churches we know, there is scarcely one that makes us less disposed to estimate the internal quality of a building by its exterior. With the solitary exception of St. Paul's Cathedral, all Wren's churches are ungainly buildings till we enter them, though we must confess to the beauty of the steeples. But what we desire particularly to notice as regards St. Stephen's, Wallbrook, is that after years of neglect, it is now undergoing at least substantial repairs. The dreary, unsightly wall of dirty stucco, facing the Mansion House, has been stripped of its plaster, and the stones have been redressed and pointed. On the entrance side we find the same process has transformed the dingy and begrimed front into a pleasing façade. The window-dressings and string-courses have been cleaned of plaster and whitewash, and their hammer-dressed faces look again fresh and sharp. The tower, perfectly plain, has been treated in the same manner, and resembles one of those campaniles which flank the churches in Italy. As every one knows, it is crowned by a columnar composition of two tiers, whose unique and elegant outline is mainly produced by the broken lines of the cornices and the angle columns. One of the most remarkable points is the manner in which this tower has been placed a little on one side of the centre of the church, instead of forming the entrance lobby as it might have done. Its outer side is partly hidden by the narrow house which faces the Poultry, while over the entrance-archway the premises on the Wallbrook side overlap, so that the whole building seems hemmed in. The arched entrance, with its pilasters and the oval light above, are also remarkable for the carved festoons and the peculiar leaf ornament which spring out of the arch of the doorway. No less peculiar is the method resorted to in lighting the church on the north side; the recess between the tower and aisle was clearly intended to obtain light to the nave and aisle at this end.

Entering the church through the western lobby, we find very little has been done yet. The interior presents the same sombre drab hue that most of the City churches have presented during so many years of neglect and misuse, and it is only the proportions and details which still exercise their charm over the visitor. The west screen and doorway below the organ is a fine specimen of carved oak woodwork. The pedimental entrance has been saved from mutilation, and the carving only requires a little cleaning to restore its freshness. Looking through the glass doors, the dark oak pews, reredos, and canopied pulpit make a rich contrast, which remind one of the picturesque *ensemble* of some Continental church, and we almost repine at seeing these removed to make room for more modern fittings. We are sorry to hear, upon inquiry, that the funds will not permit of a careful decoration of this unique interior; and that Wren's finest church is to be denied the addition of colour which St. Mary-le-Bow has lately received. Few churches would repay better the cost of a discriminate employment of colour, and we can almost imagine what a rich polychromatic treatment would do to enhance the beauty of the interior of this church, by displaying its intricacy and play of light and shade. Surely Wren never intended the beautifully-panelled dome, which covers a large portion of the area of this church, and is its grand feature, to remain as we see it; nor the lateral vaults over its arms, and the triangular pendentives at the angles of the dome, to be merely whitewashed. The east window is of rich colour, and seems to make the sombre monotone of the walls and vaults less endurable to the eye. Its design consists of centre subjects, and medallions filled with Evangelistic emblems. On each side the aisle windows are filled with stained glass subjects, representing the Crucifixion and Ascension; while at the west end the windows are adorned by Our Saviour's Nativity and Baptism. Other Scriptural scenes fill the oval lights at the sides of the church. In spite of its condition, the admirer of our Renaissance churches will find much to interest him, besides the ingenious planning which has given such a world-wide notoriety to the church of St. Stephen's. The pulpit, with its finely-carved sounding-board, is particularly worth notice. The latter, like the pulpit itself, is hexagonal in plan, and has a roof of ogee outline; the sides are enriched by a broken cornice, handsomely finished at the angles of canopy with carved figures of cherubs holding festoons, and with carved pendants below. At the altar end is an oak reredos, with two Corinthian columns, and bold carvings in the pediment. There is an interesting railing inclosing sacrarium, of semicircular shape, composed of twisted pillars, crowned by a massive capping enriched by foliage; and the church is surrounded by a lofty dado of wainscot. But all these handsome fittings seem lost and destitute against the dismal, sombre walls; the grand painting in the north transept looks almost out of place in its dusty recess, and the very columns of the Corinthian order which carry the domical roof look begrimed. We find the funds at the disposal of the churchwardens, Messrs. A. Broad and H. Fuller, barely £2,000, are inadequate to do more than repair the lead-work of roof and dome, and to put the church into substantial repair. What has been done is a step in the right direction, but we hope those gentlemen will soon be enabled by further assistance to redeem years of apathy and neglect by expending a little on the interior decoration and improvement of one of the first of Wren's churches.

We should particularly like to see the twelve Corinthian columns supporting the dome relieved by a warm colour, the entablature carrying the eight arches enriched by gold, with judicious colouring in the frieze and architraves, and the panels in the pendentives, modelled in high relief, picked out. The circular cornice and the medallions surrounding the base of the dome, and the panelled compartments of the latter, with their relief ornaments, would admit of a lighter key of colour, commencing with a dark shade in the lower tier of panels, and rising by gradation of tone to a lighter tint.

Several new buildings in the locality call for notice. At the corner of Bucklersbury some premises with a wide frontage of red brick, relieved by stone pilasters of two orders, rather suggest a reconsideration of the combination of brick and stone, when the former material occupies so large a part of the frontage. Here the stone pilasters look rather weak, and have a skeleton-like effect upon the façade, and there is want of horizontal lines to counteract this appearance. The centre forms a flat bay of five stories, and agreeably breaks the monotony of the front. The windows have brick pediments over them, but these are unpleasantly depressed from being squeezed between the sills of the upper windows. Various recent alterations and improvements have taken place between Cheapside and London-wall. At the corner of the latter, and facing the new Carpenters' Hall, an elaborate building in the Renaissance style has been erected from the design, we hear, of Mr. Norton, architect. It is intended for a Government telegraph office. The building has two frontages, and both are faced with Portland stone. The large number of rooms required has apparently had something to do with the thickly-set windows, the openings being much in excess of the solids, especially in the side facing Carpenters' Hall. The treatment of the façades is in the French mullioned style of the latter part of the 15th century; and the windows have transoms with carved arabesques in relief up the architraves and along the friezes. The general effect of the detail is crowded, and the style, rich and elegant as it is, must be deemed unsuited for the London atmosphere. In the chimney backs a series of medallions are introduced in panels representing the four-quarters of the globe. There is a rusticated basement with arches, and the sky-line bristles with terminals. One or two other blocks of building are finished in this thoroughfare, and several good plots for building are to be let. Since our last notice of works in Cheapside, Mercers' Hall has made considerable progress. Its very extent and elaboration of detail have just now, so long as the stone is fresh and white, an attraction for those who bestow a glance upon our buildings. The flat bays which form features in the façade are striking, and relieve the repetition that would have resulted if the three-light windows had been repeated throughout. A little help in colour, too, has been given by the red polished shafts of the windows, which are carried throughout. The bays are surmounted by dormers, with pediments, and an elaborated dentil cornice and balustrade, highly carved, crown the front; along the latter, medallions or panels are introduced, with sculptured busts in relief. Strong horizontal lines mark the architecture, and these lines are enriched by frets, as in the window-friezes, and by the Vitruvian scroll in the string-courses. Ovals, with sculptured heads of animals in relief, adorn the large windows of the first floor. There has been clearly no stint about carving, for we see carved ornament in positions—as in the angles of the bays—where its value is rather questionable, and we are inclined to think the ornament has been a little too lavishly bestowed. Since the entrance, with its lofty mansard, is nearly finished, the proportions of the building can be estimated. Upon the front of this tower, Wren's old entrance to the old hall has been reproduced; but we do not think the corbelled ordinance above it has much affinity, while the canon which says "Voids should be over voids" is set aside.

THE FIREPLACE AND ITS SANITARY VALUE.

IN the anniversary address delivered by Capt. Douglas Galton the other day at the Sanitary Institute, and reported in the Building News, that gentleman alluded at some length to the warming and ventilation of buildings, and many of the observations he made are worth the attention of architects.

It is rather remarkable that the author of the address seemed to have been unaware of the recent revolution in the construction of fireplaces by those architects who strictly follow the precepts of the Jacobean leaders, for he ignored altogether the construction of large chimney-corners, and the revival of the "dog" and "hob" grate. It is certainly singular that while the president of the Sanitary Institute was telling his audience of the means for an economical use of fuel by the substitution of scientific heat-producers for the open firegrate, our our leading architects of the domestic school are bent upon closely following the least productive form of heating by the use of the old, but picturesque, open fireplace which gave to the homes of our forefathers their look of quaintness and hospitality. The figures given by the author to show the waste of fuel which takes place in the ordinary grate would have been somewhat altered under these circumstances, and it might have been shown that if ⅞ths of the heat generated by the coal is carried up the chimney of a fireplace of the common type, a great deal larger proportion passes up a chimney formed with a large hood after the old model. Capt. Galton says: "Under favourable circumstances, the coal consumed may be taken at ten times, and in many cases a still larger quantity than is necessary for producing the required warmth," so if this calculation can be taken, as we believe it may be, the waste by large openings would be still greater. Again, in speaking of the effects of radiation of heat, which is the mode of warming of all open fires, the speaker did not dwell, as he might have done, upon the obstruction to radiation caused by recessing the fireplace deeply between jambs or in nooks of the room—a custom that has lately been much followed and has won many admirers. By this plan it cannot be doubted the warmth of a fireplace is practically not felt in those parts of a room which are beyond the direct limits of radiation; that, in fact, some parts of the room are cut off from the heat, as may be practically shown by drawing straight lines through the obstructing walls. So that a room, with a recess in which a fireplace is introduced, is virtually warmed only within the immediate precincts of the recess itself, and, therefore, only those who can seat themselves within the narrow radiance of the fire can enjoy the warmth it gives. Yet this mode of planning is now very commonly followed in houses of the fashionable type. It follows from what we have said, therefore, that architects have, in many instances, unconsciously acted in opposition to the principle of radiant heat they have themselves promoted by the retention of the open fire. They have, therefore, been rather aiding the sanitary reformer in his endeavours to convince the public of the untenable position the open fire occupies as an economic heat-producer. But Capt. Galton very fairly represented the advantages as well as defects of the open fire. He showed that the rays from a fire, though they pass through the air without sensibly warming it, raise the temperature of the walls and furniture of a room, which, in their turn, impart warmth to the air, in short, that by this system the walls of a room become warmer than the air, and, therefore, they do not abstract heat from the occupants of the room, as they would do if colder than the air. On the other hand, rooms warmed by flues or hot-water pipes are rendered so by heating the air, which becomes warmer than the walls, and the latter being colder than the air naturally abstract the heat from occupants by radiation. To bring the walls up to the same temperature as those of a room warmed by an open fire, the air would have to be heated to an unpleasant degree, and hence would be less desirable for health. The argument is a sound one, and goes a long way towards reconciling us to the comforts of the open fire-grate, notwithstanding its wastefulness. The suggestions made for the prevention of smoke and the economy of fuel are not new. One consists in supplying hot air to all the rooms of a house from one stove in the basement; another in the use of an adaptation of a German stove which will admit fresh warm air, as is done by a new stove manufactured by Messrs. Doulton, which economises fuel and obviates the objection to over-heated iron stoves; and a third is the use of an apparatus heated by a flame produced by mineral-oil. Heating by water under great pressure is commended as a more economical method than the low-pressure system. The greater the pressure the quicker is the air warmed, and the more is the advantage of radiation of heat to the walls. He also describes in detail the system of heating by steam 200 houses by a central fire. Excellent as the plan is, we fear it will be a long time before such a scheme will overcome our insular prejudices, at least in the direction of our private dwelling-houses; but we venture to think that if the advantages of radiant heat can be obtained a great deal of the discomfort arising from the newer systems of heating will be removed, if not also the prejudices we have for the open fire. If, as Capt. Galton shows, we can warm our rooms by means of the walls and floor, one of the great advantages of the radiating heat of the open fire will be secured; the walls, instead of being colder and robbing heat of the occupants of a room, will be warm. Various plans have been suggested for accomplishing so desirable a system of warming; we have on former occasions hinted how the rooms of a house may be rendered warm by means of air-flues in the floor and walls, and we see the author of the address calls attention to a method of warming large surfaces of corrugated iron plates by means of steam, a method that might be applied to walls. "An enamelled surface," he says, "emits heat more rapidly than an iron surface, and, therefore, enamelled iron plates might be found a convenient form of wall surface for this purpose." The idea is worth consideration, though there are at present several plans which can be adopted that would give the same result. Some of the profession are beginning, we find, at last, after much dislike and after the conquering of some old prejudices, to realise the value of hollow walls for houses, and a few who denied their practicability and value now recommend them. This we have always contended was the first step towards economy of heating and a new system of warming and ventilation. Capt. Galton repeats what is worth remembering, that a solid one-brick wall loses by radiation one-half more heat than a wall of two half bricks and an air space between. We have confined our attention to the consideration of a point manifestly neglected in estimating the relative merits of the two systems of heating, and it is one that may be profitably kept in view.

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THE TAY BRIDGE DISASTER.

(*Concluded from p.* 35.)

MUCH confusion appears to exist amongst all classes of scientists as to the exact influence of the wind on structures generally, and it may be said that this inquiry has left the question in a more unsatisfactory state than before.—Whether the pressure of a steady unvarying gale is that which should be regarded as most dangerous in character, or the spasmodic and irregular gust which, while impinging violently in all directions, introduces new elements of danger influenced in a great measure by local circumstances? In calculating the capacity of a structure to resist gales, it is not sufficient simply to regard the strain as horizontal in character, for experience has proved that during hurricanes their influence is felt in vertical as well as level lines.

This tendency was well illustrated in the case of Telford's Menai Bridge during the great gale of January, 1839, when the platform received considerable damage, although the chains and masonry remained unharmed. Different opinions were then given as to the immediate causes of the accident, but there can be no doubt that the hurricane must have acted with great energy, either from above or below, to have caused the disturbance to the platform. Telford had provided for what he considered as the most likely wind pressure, viz., a horizontal wave, and expected, from such a cause only, a simple undulatory motion square with the line of the bridge. Even with all the elasticity which such an articulated structure secured, the result of the storm in question indicated that the natural force was eccentric in its action; otherwise, the damage would have been limited to the points of resistance offered by the sides of the platform.

The Montrose Suspension Bridge had, in Oct., 1838, suffered considerable damage, and the late General Pasley was instructed by the Government to examine and report on the accident. He considered that the hurtful impingement of the storm took place from below, whereas, Mr. Provis, who reported on the accident to the Menai bridge, regarded the damaging influence as proceeding from above. Both of these high and skilled authorities had the advantage of examining the several structures in their damaged condition immediately after the two storms which had injured them, and, therefore, could estimate pretty nearly the extent of damage, and form some judgment as to the character of the destructive storm-waves. Local circumstances must have considerable influence on the direction and violence of the hurricane gusts, and both at the Menai Straits and Montrose, the peculiar character of the adjacent country offer favourable conditions for intensifying the energy of gales blowing from westerly or south-westerly points.

A gale such as that which blew on the 28th December last must have been checked in its course by the bridge, and the moving train, caused in addition to its initial impetus a dispersion of its force, thus diverting its violence in all directions. The pressure, if from below, would test the holding-down power of the bolts in the piers because the weight of the bridge itself was insufficient to resist such a thrust, and the members of the girders only being designed to withstand a vertical strain would readily succumb to a pressure for which no provision had been made. If the damaging action proceeded from above, the character of the structure was, under ordinary circumstances, competent to resist the severest vertical strain proceeding from the fullest force of Nature's concentrated violence. If, in either case, however, disturbance arose from an obliquity in the line or direction of impact (which could only be possible, however, from deficiency of weight and imperfect holding-down or anchorage power) then, in such a case, the whole endamaged structure could no longer remain in a state of coherency, because its various members, dependent on each other for mutual support, had been deprived of their original symmetrical and constructive relationship.

The calculations which control the designs of modern engineers may be in harmony with the primary objects for which they are devised, but they fail signally when some abnormal strain assails them. The Tay Bridge, in its fairy and toy-like proportions, accomplishing a desired object, and apparently a wonder of constructive skill, lauded as the greatest effort of modern engineering skill, failed to withstand the first great and exceptionally severe natural force to which it was subjected. There has not been much advantage derived from the discussion on such rigid lines of the several points at issue in this controversy, for even admitting that the most minute detail of construction had been faithfully carried out, we are compelled to seek for the cause of destruction emanating from a wider and more general root of error other than in the calculation or conception of the design and its execution.

The main question in considering this matter must centre in the character and quality of the foundations upon which the superstructure rested. That they were good and substantial appears, from all evidence, to have been taken for granted; but we fail to see that sufficient inquiry was directed to this most vital point. The preparation of the cylinders, their accurate and true jointing, the concrete and brickwork with which they were filled or lined, their careful floatage to their destined sites, and their ultimate deposition on their submarine beds, fully indicate that ample ingenuity and means were commanded by the contractors or their agents. Some confusion seems to prevail, however, relative to the exact condition of one, at least, of these huge cylinders, and, certainly, no very reliable information has been, so far, forthcoming as to the means by which the girders were tied down or anchored to these columnar supports. The lattice character of the girders offered, of course, the least surface of resistance to wind-pressure; but we may fairly urge that the whole structure wanted weight, more especially if the initial act of destruction exerted its influence from below. Stephenson's Britannia bridge, spanning the Menai Straits, stands nobly defiant against storm dangers, because its weight cannot be moved, even if a great cyclone encircled it in its fiercest embrace. Smeaton's Eddystone has long braved the dangers of its exposed site, and remains to the present time unharmed in its structural parts, although the rock on which it is based is no longer solid enough for its support. The lines and weight of this famous structure are undeniably perfect, and its celebrated engineer, when first employed to replace the lighthouse of Winstanley, said, "My structure must have weight, and that which the storm blew away to utter forgetfulness was wanting in that respect." The modern system of lattice-bridge building most certainly imparts an alarming element of danger, and involves an amount of foresight in providing for its rigid anchorage, which is not, we fear, always forthcoming. In ordinary structures of limited span this danger is not so great; but, in such an example of the principle as that of the Tay Bridge, the utmost attention should have been directed to the holding-down power, of the structure. We speak lightly and jocularly of a "house of cards"; but the simile, although an apparently frivolous one, well represents the nature of a latticed structure when, by accident, or from want of forethought, one of its members becomes degraded or damaged. Nothing but widespread disaster will ensue, and, although the cause assigned by the engineer of the Tay bridge, his witnesses, and advocates seems trifling in character and perhaps possible, still, the accident of a portion of a short train leaving the line should not have been so destructive in its results, but have been limited to the loss of the engine and carriages. We insist upon water-tight compartments in our steam and sailing vessels; why should we not also demand, from our engineers, provision against the possibility of the destruction of a portion of a bridge, resulting in the annihilation of nearly one-third of its whole length? This is indeed a painful subject, and we feel sorrow for the engineer who, thus placed on the horns of a dilemma, conscientiously, no doubt, attributes the destruction of his structure to the stumbling, or overthrow, of a train, rather than to the violence of great and uncontrollable natural forces. A bridge so susceptible to minor danger can only be considered a dangerous trap, into which the unconscious and controlled traveller falls, a hopeless victim to the imperfections, and, it may be said, shortsightedness, of modern engineering.

We most sincerely trust that this lamentable accident may lead to a better apportionment of the duties of the engineer, for it cannot be regarded as satisfactory, after what has occurred at the Tay Bridge, as well as elsewhere, that work intrusted to the most eminent engineer ever receives due attention. Let men high in the profession receive all honour and praise; but while jealously securing these, they should not forget that even the humblest worker under their direction is entitled to some credit. There is surely abundance of engineering talent to assist in the construction of works of all kinds, and it would have been well if the North British Railway Co. had insisted upon a scientific and practical inspector being placed in charge of each pier, with special authority to supervise the whole details of construction, from beginning to end. Had such a course been adopted, we should, at all events, have known for certain that the accident was due to the principle, and not to the detail, of construction, to both of which causes the report attributes the disaster.

A RECENT VISIT TO RUSSIA.

OUR notice of St. Petersburg, the City of the North, must terminate with a glance at the art-works in oil, illustrative of the great schools of Europe, which grace the walls of the Hermitage Palace, the connection of which with the great Winter Palace of the Czar we have already noticed. In England, as in other countries possessing constitutional forms of Government, the museums and art-galleries are national, and exist as the property of the Commonwealth. In Russia, where organisations of this kind are unknown, these collections are naturally the property of the Imperial Family, and, as such, become part of the State regalia, inspections of which, in the form of sufferance, is granted to the public. You cannot pass through the Hermitage Palace without feeling that you are in a part of the great State Palace of the Czar; nor can you pass the many liveried attendants, and the numerous guards, without the impression being present that you are under the eye of his servants. We mention this because the costly collection of works of art brought within the walls of this palace is, primarily, a "trapping of State," and, secondly, a national gallery, or school for education in the higher branches of art. The collection of pictures we are about to pass in hasty review, was formed, in the first instance, by the great Catherine II., and placed in the gallery of the Hermitage Palace, erected by her in 1775. The collection has grown from time to time, under circumstances we shall endeavour to explain, until 1860, when it numbered 4,000 specimens. At that time it was placed in the hands of the learned and celebrated Dr. Waager, of Berlin, who selected 1740 of the best and most valuable of works for permanent exhibition in the galleries of the new portion of the palace. The remainder are retained by the Czar for the embellishment of his various palaces. This great German art-master submitted each work to a careful examination, the result of which he gave to the public in his work, "Die Gemälde-sammlung in der Kaiserlich Ermitage zu St. Petersburg" (Munich, 1864).

As it stands to-day, the various schools are represented as follows: 333 Italian, 115 Spanish, 944 Flemish, Dutch, and German, 8 English, 172 French, and 65 Russian. As a Continental collection of the first rank, it is the only one in which the English school is represented—a circumstance traceable to the intimate friendship that existed between Catherine II. of Russia and the English Court one hundred years ago.

Amongst the great artists, this collection boasts of the following examples: 20 by Murillo, 6 by Velasquez, 60 by Rubens, 34 by Van Dyck, 40 by Teniers, 10 by Van der Helst, 41 by Rembrandt, 50 by Wouvermans, 9 by Potter, 40 by Jacob Rysdael, and 40 by Snyders.

The collection of such a mass of art-works in modern times suggests in itself great national and political convulsions, for it is certain that if the European States had been busy in nothing beyond the arts of peace, or, in other words, in forging ploughshares from their swords, during the last century, no such collection could possibly have been made.

The great Catherine, upon founding her Imperial gallery in 1775, was free to enter the art-markets of Europe, and it is strange that her first purchase should be made on English soil in connection with the dispersion of the celebrated Walpole collection at Houghton Hall in 1779, a dispersion that caused an irreparable art-loss to this country. The mention of this Walpole gallery calls to our mind one of our most energetic collectors of art-works, viz., King Charles I., whose treasures, upon being dispersed before the fierce blast of internal warfare, was largely gathered into the hands of Lord Walpole. Could this latter collection have been secured to the nation, we should have possessed the finest in the world; as it is, they went to enrich the Louvre, the Museo at Madrid, the Belvedere at Vienna, and the Hermitage Palace at St. Petersburg. The portion falling to the latter was 89 Italian, 75 German, 7 Spanish, and 5 English pictures, which were secured for the sum of £35,000.

Napoleon's wars brought another great acquisition. This "scourge of Europe" pillaged most of the Continental galleries of Europe, notably those of the Landgraves of Hesse and Cassel in 1806. The art-treasures so acquired were borne in triumph to Paris, and went to form the "Malmaison Gallery," otherwise known as "The Collections of the Empress Josephine." Upon the fall of Napoleon, thirty-eight of the finest of these works fell into the hands of the Emperor Alexander, who paid for the same 940,000 francs. In the same year (1814) the celebrated collection of Mr. G. W. Coisvelt, the banker, of Amsterdam, came into the market, from which purchases to the amount of £8,700 were made. These were supplemented with selections from the galleries of Crozat, Baron de Thiers, Dr. Crichton (of St. Petersburg), Queen Hortense of Holland, the latter furnishing thirty of the best pictures, at a cost of 180,000 francs. Other galleries contributing were those of King William II., of Holland, and the Soult and Barbarigo collections, purchased by the late Emperor Nicholas in 1850.

These valuable pictures are arranged in a suite of rooms which forms the bulk of the first floor of the Hermitage Palace. With three exceptions, viz., the Italian, Spanish, and Flemish galleries, which draw their light from above, the whole of the rooms obtain their light from the sides. In the latter case the double windows are of great width and height, and the pictures, in faultless condition, are mostly fixed on mahogany screens, which abut upon the divisions of the windows.

These galleries, with their painted ceilings, their polished walls, floors, and fittings, are scrupulously clean, and, although at the period of our visit (December) the palace stood in a world of snow, a summer temperature obtained within. This was maintained by a free supply of hot air, which enters the rooms through square brass pipes, which project from the walls about eighteen inches above the levels of the floors. These outlets are furnished with folding doors, which can be fixed at any angle to regulate the supply of air; the action of these pipes is not felt unless you stand in the line of the somewhat hot blast, which furnishes a dry atmosphere, by no means pleasant to inhale; one that you are prepared to learn is conducive to diseases in the throat, a malady to which the Russian and North German people, from inhaling overdried air, are subject.

Descending to the pictures themselves, it is impossible for us to notice any but the most prominent.

IN THE ITALIAN SCHOOL,

Paul Veronese furnishes a "Dead Christ," supported by the Virgin and an angel. This is remarkable as being one of the few pictures by this artist possessing a religious feeling. Sebastian del Piombo has a similar subject, "The Descent from the Cross," a picture purchased from the King of Holland's collection, for the large sum of 29,000 florins. Tintoretto furnishes two fine works, "Perseus and Andromeda," and "The Resurrection," the latter being the original design for the enormous picture at Venice. The "Repose in Egypt," "St. Francis," and "The Virgin at School," by Guido, are marvellous works. Salvator Rosa is represented by eleven specimens, five of which came from the Walpole collection, the best being his "Prodigal Son." Canaletto has two fine works, "The Doge of Venice Marrying the Adriatic," and "The Reception at Venice of Count Georgie, Ambassador of Louis XV." In this gallery may be seen the famous Raphael, "The Virgin and Child." This picture was presented by the Emperor to the late Empress, on the 25th anniversary of their wedding, as a silver-wedding gift! Of more interest to ourselves is the "St. George and the Dragon," by the same author, painted in 1506, by order of the Duke d Urbino, for presentation to our King Henry VII., in return for the Order of the Garter bestowed on that nobleman. As a compliment, St. George himself is shown wearing the Garter. This picture was in the gallery of King Charles I., but it came to its present owner from the Crozat collection. Its first use upon arriving in Russia, was as a shrine in the hall of St. George in the Winter Palace. The most pretentious works of Raphael are his nine frescoes, removed in 1861 from the ground-floor of the Villa Spada on Mount Palatine in Rome. These are considered as the work of Raphael and his pupils from 1512 to 1515. One "The Abduction of Helen," is repeated in the Bernal collection in the British Museum, and in the drawings at Chatsworth, and at Oxford.

Of other artists of the Italian school, we may note that Leonardo da Vinci, Correggio, Titian, Paul Veronese, and Caracci, are well represented.

THE FLEMISH SCHOOL

is rich in works by Rubens and Vandyck, the best of which have been drawn from the Walpole collection. By the former artist we may note "Mary Magdalene Washing the Saviour's Feet," and "The Expulsion of Hagar;" and by the latter, "A Portrait of Inigo Jones," one of "Philip, Lord Wharton, at the Age of Nineteen," and another of "Archbishop Laud." This same artist furnishes portraits of "King Charles I.," "Queen Henrietta Maria," and others of great historic value to the English people.

THE SPANISH SCHOOL

is considered the best and most varied out of Spain. Murillo, as above stated, is strongly represented. With the exception of the following, "Celestine and her Daughter in Prison at Seville," "A Peasant Girl," and "A Young Beggar," they are all sacred subjects, the best of which is considered his "Angel Delivering St. Peter."

One of the galleries is set apart for the works of

PAUL POTTER, TENIERS, AND WOUVERMANS.

Of the first artist, that entitled the "Watch Dog," is a remarkable example; another, "The Farmyard," signed and dated 1649, is considered a masterpiece; this was one of the gems drawn from the collection of the Empress Josephine. Another, from the same collection, entitled "The Hunter's Life," is very rich in humour; it depicts the animals turning master and punishing the hunters in various forms. Teniers' most important picture is "The Arquebusiers of Antwerp." The figures are mostly portraits of the period, and the artist himself is shown in the act of being admitted to the corps. Another characteristic picture is the "Interior of a Kitchen," in which the artist is depicted as the landlord; this example has been drawn from the Walpole collection. There are also examples of all his subjects: landscapes, cattle, historical portraits, and even a sea-piece. Wouvermans' pictures are very numerous; one of these is remarkable as being an example of his landscapes, without the introduction of the proverbial white horse.

Another gallery is set apart for works by

REMBRANDT AND ENGLISH ARTISTS.

There is no collection in existence where the works of Rembrandt can be studied with such advantage, for the Hermitage is unique in the quality and number of this artist's works. Two portraits are exhibited, showing his earliest and latest style: the one dated 1634 and the other the year of the Great Fire in London (1666). The portraits of this artist are numerous: some are highly finished, others free in style, amounting to coarseness; but the effect of these, when viewed at a distance, is very masterly. His most important works are "The Parable of the Lord of the Vineyard," in which the principal figure is a highly-finished miniature, and "Peter Denying Christ." His "Portrait of an Old Man in profile," is a masterpiece of free handling, the peculiar treatment of the beard being the work of the pointed or sharpened end of the brush-stick.

THE ENGLISH SCHOOL

is represented by Sir Godfrey Kneller, Thomas Jones, Sir Joshua Reynolds, Dobson, and Robert Walker, the latter furnishing a portrait of Oliver Cromwell. Sir Joshua Reynolds counted amongst his patrons the great Catherine of Russia, for whom he painted an important work in 1789, the subject and price being left to the discretion of the artist. The subject chosen was "Hercules Strangling the Serpents," which was intended to be allusive to Russia contending with the difficulties which beset its youthful state. For this work the artist charged the modest sum of 1,500 guineas. This sum the great Catherine paid through her English ambassador, and to mark her approval of the work, she presented the artist with a gold snuff-box, the lid of which contained a miniature of her Majesty, set about with large diamonds. The correspondence at that time shows that another and a larger work was in progress, this is supposed to be the "Continence of Scipio," an unfinished work said to have been the last of Sir Joshua's. Near this is a portrait by the same artist, executed for Prince Polenskin, at a cost of 100 guineas; it is that of a pretty Englishwoman who had a defect of vision; this has been artistically overcome by the position of the hand, which casts a shadow over the eyes. Sir Godfrey Kneller is represented by a portrait of "Grinling Gibbons," and another of "Locke."

THE EARLY GERMAN AND DUTCH SCHOOLS

are well represented, and many of the works are of special interest to the English people. Sir Anthony More furnishes two portraits of great merit—Sir Thos. and Lady Gresham. Holbein is partially represented by a portrait of King Edward VI., once the property of King Charles I., and latterly of Lord Walpole. Reubens is well represented by six paintings executed by his pupils, from designs by the great master himself; these were sketches for the triumphal arches erected at Antwerp, to greet the solemn entrance of the Infant Cardinal Ferdinand, brother of his Catholic Majesty Philip IV., of Spain. These works are allegorical, and represent "Peace and War contending at the Temple of Janus." Still more interesting are his two sketches for the decoration of the ceiling of Whitehall Palace, made by order of King Charles I.; one of these represents King James I. seated on his throne with Pallas, Juno, Venus, and Cupid before him, the foreground being occupied by the Genius of Peace burning and destroying armour. This work was once the property of Sir Godfrey Kneller; but it came to the present owner through the Crozat collection.

The other is the "Apotheosis of James I.," late in the Walpole collection. Although of great merit, we have not space to notice other works of this artist. Angelique Kaufmann furnishes two fine works, the subjects of which are drawn from Sterne's "Sentimental Journey." Amongst Van der Helst's works are two portraits, specimens of which are rarely seen out of Holland. Jan Steen's "Game of Tric-trac" is worthy of notice; the artist is here shown in the act of playing with a lady. Jan Van der Heyden has two very characteristic street-scenes in Amsterdam and Cologne, where, as is usually the case, the figures are by A. Van der Velde.

THE FRENCH SCHOOL

is represented by some masterly works, noticeable amongst which is a portrait of Mary, Queen of Scots, by a pupil of "Clouat." This is said to have been painted at Fotheringay Castle. Claude, Watteau, Demarne, and Granet furnish some charming pictures.

THE RUSSIAN SCHOOL

is one of great interest. This was founded in 1759 by Lossenko, a native artist. The works here are mostly large, and the subjects are mainly mythical, the colouring being crude and severe. These salons are open to art-students, who, with few exceptions, take up their stand in this particular gallery, the favourite artist being one Neff, whose subjects resemble those of the late Wm. Etty. The two most marked pictures by this artist are "Nymph going to bathe" and "Nymphs bathing." Ugriumoff, a pupil of the founder, is represented by two historical pictures, "The capture of Zazan by John the Terrible in 1552," and "The election of Michael Romanoff to the Throne of Russia." The finest work by these native artists is "The Last Days of Pompeii," by Trülo, but there are some very creditable productions by Aivazofsky, Thruni, and others.

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THE PAVING OF "NEW STREETS."

THE Parliamentary Committee of the Hackney Vestry have prepared an exhaustive report on this subject, which is of great importance to builders, owners of house property, and others liable to apportionment-payments. The reference to committee was upon a motion by Mr. Button: "That the paving by the authority of the District Board of Works of certain new streets or parts thereof out of the general rate, is contrary to the provisions of the Metropolitan

Local Management Act, 1855, sec. 105, and the Metropolitan Local Management Amendment Act, 1862, sec. 77, and that the sums so expended, should forthwith be charged to the owners of the houses forming such street, and of the land bounding or abutting thereto; that the general rate should be recouped the amount so expended, and that it be an instruction to the District Board of Works henceforth to carry out the provisions of the said Act in respect to paving." The committee report that having had the sections of the Acts under review, and the decisions of the Courts of Law thereon, they "are clearly of opinion that the Legislature intended by the passing of these Acts, that no first paving need be made at the cost of the ratepayers." At first, there appeared to be some difficulty in carrying out the provisions of the Act of 1855, as to charging the cost of paving new streets on house-owners, which, by sec. 250, defined the word "street" to include any "highway (except the carriageway of any turnpike road), road, bridge, lane, footway, square, court, alley, or passage, whether thoroughfare or not," and also as "part" of any such highway, &c., and by sec. 112, of the Act of 1862, the word "street" was held to include "mews," and the word "new street" was declared to mean and include "all streets hereafter to be formed or laid out, and a part of any such street, and also all streets the maintenance of the paving and roadway whereof had not previous to the passing of the Act been taken into charge and assumed by the authorities having control of the paving and highways in the parish, and also a part of any such street, and also all streets partly formed or laid out." Since the passing of the Act of 1862, many cases have been submitted to the superior courts for decision, respecting the paving of streets, and the vexed question of What is a new street and what we are liable to pay for the paving? has been fully settled by the decisions in the cases of Pound *v.* Plumstead District Board of Works, in 1871, and reported in 7 L.R.Q.B. 183; Dryden *v.* Putney Local Board of Health, in 1876, reported 1 L.R. 1 Ex. D. 223; Attorney General *v.* Wandsworth Board of Works, L.R. 6, Chancery Division, 539, and other cases too numerous to mention. There are of course numerous other decisions on collateral questions, but the above cases fully settle the application of sec. 105 of the Act of 1855, and sec. 77 of the Act of 1862. The district over which the Hackney District Board of Works exercises authority, was one which at the time of the passing of the Act of 1855, contained 28 miles of roadway and 69 of footways under the control of the Board, and 23 miles of roadway and 21 of footpaths not under its control, and was in fact a rural district, and "its footways stood alone in being unpaved amongst those of all the surburban parishes" (report for 1856). It was considered best to preserve its rural character as long as possible, but the time came when it was necessary to pave the old footways which were laid out before the passing of the Act, and the Hackney District Board of Works took under their consideration the advisability of adopting sec. 78 of the Act of 1862, but came to the resolution that the old footways should be paved out of the general rate. There is, however, a resolution in the minute books of the Board: that where the owners of houses would agree to contribute a moiety of the expense of paving the old footways, the Board would at once lay down paving, with a view to the general benefit of the district. The committee then call attention to the Hackney paving loans, and to the fact that over £100,000 has from time to time been collected from owners for paving new streets. Out of the last loan, there was expended £3,606 2s. 11d. for paving Sidney, Grove, Cassland, Amhurst, Clarence, Downs-park, Dowus, London, Eleanor, Loddiges, and Paragon-roads, and Lamb-lane, which thus falls upon a general rate, and the question which occupied the earnest and careful attention of the committee was whether these roads were "new streets" within the meaning of the Act, and therefore ought to have been charged on the owners, under sec. 105 of the Act of 1855, and sec. 77 of the Act of 1862. The list above given, it may be observed, does not represent the whole of the roads and streets in the district which have been paved at various times out of the general rate, as of course is apparent from the expenditure, but only such as were involved in the resolution of reference to the committee. There are at the present time streets in the district which have been paved out of the general rate on one side only, the other side being still unpaved. To ascertain whether the roads mentioned in the schedule are "new streets" within the meaning of the Act, the committee have had special attention directed to the cases of Pound *v.* Plumstead District Board of Works; Dryden *v.* Putney Local Board of Health; and the Attorney General *v.* Wandsworth District Board of Works. From the facts connected with the roads as regards the Putney case, the committee are of opinion that it may be fairly contended, from the further light which the above cases have given upon the subject, that each and all of the streets and roads mentioned in the schedule are analogous with the cases above mentioned, and are "new" streets within the meaning of the Act.

Illustrative and confirmatory of the committee's opinion, they append to the report an appendix giving the facts of Dryden *v.* Putney Overseers, setting forth that the appellant had been for eight years the occupier of a house in High-street, Putney, at some distance, and quite separate, from Upper Richmond-road, hereinafter referred to; and the distress was made in respect of part of a rate to which he was assessed in respect of his house at High-street. Upper Richmond-road was an old highway, and had been kept in repair for 40 years by rates raised from the ratepayers of Putney. At the time of passing the Metropolitan Local Management Act, 1855, this road had on its south side an irregular line of houses, but 434 yards out of the entire length of 734 yards were bounded by market gardens, and on the north side there were gardens, except at two places where there were two cottages; along the south side there was a good raised gravel footpath, and on the north side a narrow, ill-defined foot track. Since 1855, the two cottages have been pulled down, and the whole of the frontage land on the north side covered with houses, and in the course of building the old boundary hedge, had been removed and a fence formed; at intervals from 1864 to 1870, the Wandsworth District Board of Works fixed a granite kerb and gravelled the path, which were paid for by the Board out of the general rates of the parish, since which the footpath had been repaired by the Board. In 1874, the Board asphalted the southern footpath, the cost being included in the general rate. Prior to this, the appellant had (in June 1874) urged the District Board under the circumstances that the road had become a "new streeet," under the Metropolitan Local Management Acts, and that the cost of paving the footpath ought to be borne, not by the ratepayers of Putney at large out of the general rate, but by the owners of the houses and land abutting on the footpath in question. The District Board, however, refused to accede, contending that the road was not a "new street" within the meaning of those Acts; appellant refused to pay 1s. 6d., part of the amount at which he was assessed to the general rate, on the ground that that sum represented the proportion charged for the paving of the footway, an expense improperly included in the general rate, and in consequence of such refusal, 10s. 4d. was levied on appellant's goods by a magistrate's order. It was admitted that 1s. 6d. was a proper proportion of the rate of £1 11s. 6d., attributable to the cost of the paving in question, and that if the appellant was not liable as the occupier of his house in High-street to contribute to the cost of such paving, the rate of £1 11s. 6d. ought to be reduced by the sum of 1s. 6d. The question for the opinion of the Court was: whether under the circumstances above set forth, and having regard to the provisions of the Metropolitan Local Management and Amendment Acts, 1855 and 1862 respectively, the appellant, as occupying the premises in High-street, was liable to contribute to the expenses of the above mentioned paving on the north side of Upper Richmond-road. The case was heard before Mr. Justice Grove and Mr. Justice Quain, in 1876, and the decision of the Court was in favour of Mr. Dryden, and against the District Board of Works. This important report is fixed for debate at the next meeting of the Hackney Vestry in August, and then, if adopted, it will be sent to the District Board of Works, where it is sure to be stoutly opposed.

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RAISING CHIMNEYS.

THE rights of building and adjoining owners, as laid down by the Metropolitan Building Act, are not so well defined that we can call the provisions perfect; in operation they are not always found to work so smoothly as could be wished, evidence of which has not been wanting in reports of cases we have given lately. The rights to make good and repair, to pull down and rebuild, to raise party-structures, are constantly giving rise to litigation, and it is of course always difficult to make an adjoining owner see the justice of alterations he is not a willing party to. In the raising of walls, various questions as to the invasion of existing rights occur; as for instance in the obstruction of light to ancient windows, but in this instance, an adjoining owner can bring an action, and the clause does not take away the right of any individual in common law. The other day, at a meeting of the Metropolitan Board of Works, a letter was read from Mr. W. H. Skynner, stating that he could not acquiesce in the views expressed by the Board respecting his inquiry whether the raising of the chimneys of the house number 7, Neville-terrace, South Kensington, is, or is not, justified by the Building Act? and suggesting that a short "Act should be obtained prohibiting the exercise of the rights given to a building owner to raise the chimneys of an adjoining owner to a greater height than 5 feet above the roof of that house, and for making compensation where any chimneys are raised above that height;" and requesting the opinion of the Board with regard to the provisions of the 83rd section of the Act. We cannot but think the letter of Mr. Skynner expresses a general opinion as regards to the raising of structures. His objection in this case to the exercise of the right of a building owner to raise chimneys of the adjoining house to an inordinate height seems just, for from a perusal of the 83rd section we find nothing to prevent a chimney being carried up to a greater elevation than desirable. In fact the burden of sub-clause 6 seems to be that the building owner must raise the chimneys if necessary, as he is given the right to carry up "to the requisite height all flues and chimney stacks belonging to the adjoining owner on or against any such party-structure or external wall." The framers of the Act clearly had in view the primary duty of the building owner in raising the flues and stacks of adjoining owners to their proper height to prevent smoke, and they scarcely thought of a period in the history of architectural taste when chimneys would be carried up as features of buildings to an excessive height. But such is the fluctuation of fashion in these matters, that it appears now to be necessary to legislate against the raising of chimney shafts, and we can foresee as much inconvenience and danger as likely to arise from the practice, as that against which the provisions of the Act were mainly directed. A chimney may be carried up to an inconvenient and dangerous height, if a building owner with the Queen Anne craze strongly developed, proceeded to overtop his neighbours' house by two or three stories, and in addition thereto, carried up a shaft of some ten feet. It is true the 84th section makes it imperative for the building owner to comply with any reasonable requisition of the adjoining tenant, and that both parties have the option of a reference; but the question of height ought to be independent. There is a particular exception to be made to an ordinary rule, and that is: when the raised building has in addition a mansard, or steep roof, in which case the height of a shaft should be sufficient to clear the summit of the roof.

The rules respecting the construction of chimneys and flues in the Metropolitan Building Act are not unfrequently set aside. Section 20, sub-section 9, provides that chimney shafts shall be carried up in brick or stone at least 4in. thick all round, to a height of not less than 3ft. above the roof, flat or gutter, that height being measured from the highest point in the "line of junction with such roof flat or gutter"; and the next clause further provides that the brickwork or stonework of any chimney shaft, excepting that of a furnace of any brewery, manufactory, &c., shall not exceed in height from the same point in the line of junction six times the least width of such shaft at the level of such highest point, unless it be "built with and bonded to another chimney shaft not in the same line with the first, or otherwise rendered secure." We refer to these rules to show that the Act contemplated the limitation of height of erections of this kind. In practice, however, it can scarcely be said any rule exists; we find the utmost irregularity in the heights and construction of chimneys prevailing, as any one may convince himself who takes notice of the construction of chimneys in any of our main thoroughfares. A hard and fast rule would be impossible; but there should be a little more attention to this point than at present seems to exist.

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PORTLAND CEMENT FOR ROOF AND FLOOR CONSTRUCTION.

PORTLAND cement is comparatively a new material, and as its properties become more known, so does its application for structural purposes advance. One of the most novel and useful applications is its adoption (when made into a concrete) for the entire construction of floors and flat roofs. At present great uncertainty exists, not only as to the proper scantlings to be given to such floors and roofs, but even as to the way to proceed in calculating the strength of these plates as it were, because they have to be considered as plates, either resting on four walls or firmly attached at the edges to four walls. The basis for the calculation will be the strength of the neat Portland cement, and upon this subject there has already been published a very great deal of information. The high stresses of 6,000lb. pressure per cube inch, 600lb. tensile, and 350lb. transverse, on the super. inch, have been obtained from well-matured Portland cement. It is also known if such good cement be mixed with three parts of very carefully-prepared chards from hard-burnt clay a concrete can be formed which will have a strength equal to the cement. In practice it is necessary to take a very much lower standard of strength for the calculation of these concrete plates, because the strength of the concrete has to be called into play long before the concrete is thoroughly matured. About one-seventh part of the ultimate strength will be found a safe basis for the calculation of the strength of these plates six weeks after they have been made. This will give a constant of 50lb. per inch transverse for the calculations. It will be well first to consider the simple case of a plate of concrete resting upon two walls, and from that to proceed to unravel some of the difficulties surrounding the more complex arrangement of a floor supported upon four walls.

Suppose the floor or roof to be a square plate 8in. thick, 20ft. span, and that each superficial foot weighs 94lb. As the constant for strength is to be 50lb. per inch, then this plate, supported as a beam upon two walls, will fall under the formula of $\frac{8\,K\,B\,D^2}{L} = \frac{400 \times 240 \times 64}{240} =$ 25,600lb., or 64lb. per foot superficial. As, however, the weight of the plate is 94lb. per foot super., it is evident it could not be supported as a beam resting on two walls. Supposing, however, it had been possible to support the plate on two walls, the shear upon each foot run of the walls would have been 640lb. Now, suppose the plate to be supported on four walls, it is evident the shear upon the walls with the stress of 64lb. on the foot super. will not be equally distributed; but beginning at the angles at only 32lb. per foot run on the walls, the shear midway between the two angles will be 640lb. on the foot run. From this circumstance it follows the plate will be strongest at the angles and weakest at the centre.

In proof of this, suppose the superficial foot at each angle to be separated from the rest of the plate, and to be fixed into the walls, then the formulæ for the stress of a distributed load on this foot will be at least twice $\frac{2\,K\,B\,D^2}{L} = \frac{100 \times 12 \times 64}{12} =$ 12,800lb., if it does not even fall under the higher formula of a load on a triangle 24in. base, and 12in. altitude, with the load concentrated at $\frac{1}{3}$ the altitude, or equal 19,200lb. Suppose, however, the lower formula be taken, then that will equal a load of 12,800lb. on the foot of each angle of the plate, and a sheer of 6,400lb. on each foot of wall inclosing the angle.

Or, in other words, the foot super., at each angle of the plate, is 200 times stronger than the weakest portion of the plate, and it can be similarly shown, that with an hypothetical system of loading, the total load of 167,240lb. could be sustained by the plate resting on four walls. As, however, this hypothetical system of loading is quite impossible in practice, the problem of the breaking stress, for a uniformly distributed load over the whole plate when supported on four walls, still remains unsolved. From the foregoing remarks, it is, however, clearly pointed out that as the increase in the supporting power of the plate is very rapid as the angles of the plates are reached, it can be safely assumed a square plate can be loaded with the same equally distributed load, as a circular plate of equal diameter and thickness. Taking this assumption as a step towards a solution of the problem, it is necessary to work out the breaking stress, for an equally distributed load over a circular plate 8in. thick, and 20ft. diameter.

This can be formulated by resolving the circle into a triangle, whose base equals the circumference, and altitude equals the radius. Then $\frac{K\,B\,D^2}{\frac{1}{3}\text{ radius}} = \frac{50 \times 754 \times 64}{40} =$ 60320lb. As the area of the circular plate is 314·16ft., that equals a distributed load of 192lb. per foot super. with the edges fixed, or 96lb. per foot super. with the edges free.

The shear upon the circular wall, will, however, be only 480lb. per foot run when the plate is free at the edge, and yet the load is 50 per cent. more than that of the square plate, resting on two walls as a beam.

Taking, therefore, 96lb. as the breaking stress per foot super. over a square plate resting upon four walls, another method of investigation is opened up. Suppose the angles of the square plate to be cut out, so as to obtain a plate in the form of a Latin cross; each arm of which is 240in. in the clear, and 160in. wide. With such a form of plate, the shear upon each of the four walls will be nearly equally distributed, and the breaking stress of such a cross will be twice $\frac{8\,K\,B\,D^2}{L} = \frac{400 \times 160 \times 64}{240} =$ 17,066lb. × 2, or 34,132lb.; then, as the area of the plate, when cast into the form of a Latin cross, is 355·5ft., that will give 96lb. per foot super. as the breaking stress; or, in fact, exactly the same as the breaking-stress for the circular plate. Furthermore, the shear per foot-run upon the walls will be exactly the same as when the square plate was supposed to be supported on two walls, that is, 640lb. per foot run.

The margin between the weight of the plate and the breaking stress is so small, being only 2lb. per foot super., it is evident it would be exceedingly riskful to rest the square plate on four walls. Suppose, however, the Latin cross is firmly fixed into the four walls at the edges, then that portion of the cross projecting from the central square will act as four cantilevers; and as each cantilever is thus 40in. long, the formula $\frac{K\,B\,D^2}{L} = \frac{50 \times 160 \times 64}{40} =$ 12,800, is the breaking stress at the end of each cantilever. It can be demonstrated that, as each cantilever equals in area one-fourth part of the central portion of the cross, then if the 12,800lb. be divided into three equal portions, two of these portions, that is, 8,533lb. represents the distributed load upon one-fourth part of the central portion of the cross; and the remaining third represents a weight of 4,266lb. acting at the end of each cantilever, and thus equal to a distributed load of 8,533lb. over the area of each cantilever. The area of each cantilever, and of one-fourth part of the central portion of the cross, is, in each case, 44·44ft.; so that equals 192lb. per foot super. distributed load for the breaking stress, or 98lb. per foot super, over and beyond the weight of the material; and 192lb. is again exactly equal to the breaking stress upon the circular plate, with the edge fixed.

The effect of removing the centering from underneath such a plate of concrete, either square or circular, and firmly fixed into the supporting wall, would be as follows:—First there would be a deflection due to the weight of the material; and second, there would be a time deflection, probably of many hours duration, due to the continuance of the stress upon a plastic material.

It is hoped these foregoing remarks may prove of use to those who may have to construct concrete floors, or roofs, but it has also to be remembered, the conditions for success will depend upon the walls fulfilling two conditions, of very great importance, when using this novel method of forming roofs and floors. The first condition is absolute uniformity in the settlement of the supporting walls, and the second condition is that the walls where the roofs or floors terminate, such as external walls, be of sufficient thickness to resist the very large reactions upon them when these plates are fixed into them. As regards the first condition, if proper care has been taken with the foundations, their uniformity of structure, and materials in the walls, combined with building them at a uniform level day by day, will be the best safeguard; but as regards the latter, each doubtful case will require to be investigated, and properly calculated. As an example of the necessity for so doing, suppose the square plate before considered was built into four concrete walls, each 8in. thick, then it will presently be shown that it would be utterly fallacious to take the breaking stress as 192lb. per foot super. for this example, because the reactions on the supports will be too great for such thin walls.

It was before seen 12,800lb. is the breaking stress upon the cantilever portion of the plate when cut into the form of a Latin cross, supposing the load to act at the end of the cantilever. It will, however, be easier to consider the reactions upon the walls if only one foot run of the wall is calculated; then $\frac{K\,B\,D^2}{L} = \frac{50 \times 12 \times 64}{40}$ = 960lb., acting at the end of a lever 40in. long and having the fulcrum on the inner edge of the wall 1ft. run. To balance this weight over an area of only 1ft. wide, 8in. long, for the other end of the lever, the enormous weight of 9,600lb. would be required or its equivalent; that is to say, cohesion between the plate and the wall. As, however, under ordinary circumstances, the cohesion or tensile strength of a concrete wall six weeks old would not be more than 20lb. per inch, then this cohesion will only counteract 128lb. out of the 960lb., as it is only equivalent to half the area of the wall, acting at two-thirds distance from the fulcrum, that is 960lb. at a distance of 5·33in. from the fulcrum. Thus there is still a reaction caused by the weight of 832lb., acting at a distance of 40in. from the fulcrum, and to balance this a perpendicular load of 8,320lb. would be required upon the wall per foot run, or, in other terms, a wall about 90ft. high, which is not a practicable height. To illustrate how soon the wall approaches a suitable thickness, it is only necessary to say that if the wall is twice 8in. thick, the height of wall (after allowing for the cohesion between the plate and wall) will then be less than 12ft., and if the wall is made 2ft. thick, the cohesion between the wall and the plate will be of itself sufficient to counteract the weight of 960lb., acting 40in. distance from the fulcrum.

When thin internal walls are used, with concrete floors, it is important to have the floors of uniform thickness over the whole area, and passing over also the whole area of the external walls.

It will now be instructive to consider the ultimate strength of the square floor, after all the plasticity in the concrete is reduced to its normal condition. It has been before stated it might become as strong as well-matured Portland cement, or seven times stronger than the constant of strength used in the calculations. This knowledge is, however, only useful to control visionary schemes of construction, based upon tests giving high breaking stresses; for even suppose it to be the case the concrete ultimately reaches seven times the strength, it would not be prudent to reduce the scantling below 8 inches thick for a square floor 20ft. span; and it has also to be remembered, that thin plates with high breaking stresses will have a much more powerful reaction upon the walls than thick plates. It may be safely assumed the concrete will reach, at least, three times the strength of the constant; or a breaking stress of 576lb. per ft. super.; and, after deducting the weight of the material, 482lb. per ft. super., which is a strength amply sufficient for the ordinary exigencies of practice. The great mass of material in the floor will also render it a very safe floor, to resist any sudden impact.

For roofs, and even in some cases for floors, it might be an advantage to depart from the plate of uniform thickness, and, instead, to proportion the floor or roof, so as to obtain uniform strength for a distributed load. The difficulties as regards the reactions upon the walls and resilience will, however, be thus greatly increased. The highest development of concrete construction, will be, when it is employed for parabolic or other domes, as, in such a case, at least double the constant of strength could be used in the calculations. These structures will probably be made with high-class concrete, taking the form of an inner and outer shell, with cross-walls joining the two together.

The advantages of calling into play the tensile and transverse strength of concrete for domical structures is, as yet, an unexplored field of inquiry. Of this, however, there can be but little doubt—concrete domes could be made of very much larger dimensions than is possible with either brick or stone.—I am, &c.,

A. C. P.

DETERMINATION OF THE THICKNESS AND FORM OF THE ARCHES OF STONE BRIDGES.*

By G. TOLKMITT.

THE thickness necessary for the arch of a stone bridge depends on the strength of the materials of which the arch is built, the load it has to bear, and the form and dimensions adopted for the arch-ring. All empirical formulæ, used for determining the depth of the crown, which do not contain these three factors, can only be regarded as giving adequate approximation when applied within narrow limits. If the span of the arch be small, and the backing above it of little depth, it is necessary besides to take account of a partial distribution of the live load. It may generally be said that the thickness required will be least when the form chosen for the arch is such as to make the line of pressure which corresponds to full loading coincide with the mean line of the arch-ring. In a former paper, published in the "Zeitschrift für Bauwesen" of 1876 the author has gone fully into this question; and the results then obtained have been collected and reproduced in a small table. The chief object of the present paper is, however, to establish a formula which, while taking due account of the three factors, gives also an easy means of determining the thickness at the crown of such arches. The formula is not strictly accurate, but numerous applications which have been made of it have proved that the approximation, even in extreme cases, is very great.

The author examines two distinct cases:—1st. The evenly-distributed live load, covering the entire length of the span. 2nd. The live load extending only from one of the abutments to the centre of the arch. The latter case leads generally to greater thicknesses than the first, but still it is always advisable to try both hypotheses. If c be the thickness at crown, it can be expressed in the first case by

$$c = \frac{\cdot15 \times \frac{w^2}{f}}{q - \cdot15\,\frac{w}{f}}\left(c + p + \frac{f}{10}\right).$$

e, depth at crown of the surface, representing the permanent load on the arch. It is comprised between the extrados and a horizontal line above it.

p, depth of horizontal strip, representing the live load.

w and f, span and rise of the intrados of the arch.

q, greatest pressure admissible on the stone.

The formula is independent of the choice of unit, which may be at pleasure the foot, the yard, or the metre. Although q is equivalent to a weight, it is not to be expressed by a number of units of weight, but by the volume of stone of a like weight. Thus, supposing the stone to be able to bear safely 80 tons per square meter, and to weigh 2 tons per cubic meter, the numerical value of q to be introduced into the formula will be $\frac{80}{2} =$ 40 cubic metres.

In the second case, that of partial distribution of the live load, the expression of c depends on the nature of the assumption which is made with regard to the springings. When they are assumed as rigidly fixed, the value of c will be smaller than when they are supposed to admit of slight angular displacements. It is, therefore, judicious to adopt the second hypothesis, although probably farther from the truth than the first. The equation becomes in this case:

$$c = \cdot625 \times p \frac{f}{c + c + \frac{p}{2} + \frac{f}{10}} \times \frac{2w - f}{2\,w}.$$

The symbols have the same signification as before; the thickness at the crown being computed, there remains to draw the arch in its right form. This is done by means of the table already cited. The operation is extremely simple, reducing itself to the multiplication by numerical co-efficients of a series of figures contained in the table.

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[*] Zeitschrift des Architekten- und Ingenieur-Vereins zu Hannover. Translated for Institution of Civil Engineers.

MR. NEWTON ON GREEK PAINTED VASES.

MR. NEWTON'S ninth lecture (a supplementary one), which concluded the course on Ancient Greek Art, was given at University College, Gower-street, on the 7th inst. It treated of the designs on Greek painted vases. These vases formed a distinct branch of fictile or ceramic art; the designs with which they are decorated might, therefore, be called specimens of Ceramography. The earliest examples of such designs carried us back to the earliest period of Hellenic, and perhaps, of pre-Hellenic civilisation. In the rudest of these specimens, found at Athens, Mycenæ, and Rhodes, the human figure rarely occurred, or, if represented, was drawn as a child might draw it. A large class of this early pottery was ornamented either with geometrical or floral patterns. Next came the style now called Asiatic, because believed to come from a Babylonian or Assyrian source. In this style zones of animals, with occasionally winged monsters, encircle the vase, and in the blank spaces between these animals are flowers and symbols. As drawing improves in this style, the human figure is introduced, with something like dramatic action, and the subject represented is explained by names written over the figures. The lecturer illustrated this phase of ceramography by a design on a Rhodian vase on which was represented a scene from the Trojan war, in which Hector and Menelaus are fighting over the body of Euphorbos. In the next stage of the art the figures were painted in black on a red ground, the details of anatomy and other inner markings being rendered by incised lines and conventional colours. The drawing in this style is generally harsh and full of archaic mannerism. A further change was introduced by making the ground of the picture black, the figures being red with inner markings drawn in faint lines of deeper tint of red. Small details and accessories were picked out with other colours; but, as the predominant colour was red, these designs might be called monochrome. This style probably began as early as the time of Polygnotus or earlier, and continued till the time of Alexander the Great. At Athens and in Sicily and in a few other places we met with another contemporary style of vase-painting, in which the figures were painted in several colours on a white ground. A very beautiful specimen of this style was to be seen in the British Museum—a Rhodian cup, inside which is painted Aphrodite riding on a swan. This vase is probably of the time of Phidias. Both in the monochrome style, with red figures, and in the contemporary polychrome style there was no attempt at chiaroscuro, and yet the painters who decorated these vases were the contemporaries of Apollodoros, Zeuxis, Parrhasios, Pausias, by whom, as we know from Pliny, chiaroscuro was gradually developed by a series of steps. The reason why this improvement in the art of painting so little affected ceramography was mainly that the convex or concave surface of the vase was better adapted to a design kept very flat than to one which by chiaroscuro suggested the idea of relief, and because in the great age of art the composition of the vase-picture was determined in most cases by the form of the vase itself, which was regarded, like the triangular space of a pediment, as an architectonic necessity. The absence of chiaroscuro, again, led the vase-painter in the best period to avoid complicated foreshortening and groupings; the face is generally seen in profile, and the figures are kept in one plane. In the contemporary polychrome style the colours are harmoniously combined, but not modified by light. About the time of Alexander the Great, when the eye of the Greeks was dazzled by the splendid colouring of Apelles and increased private wealth led to a more sumptuous style of decoration, several innovations were made in vase-painting. The designs with red figures we find introduce gilding, and here and there a figure in white. Other colours were introduced in the accessory details. One of the finest examples in this style is a vase from Camirus, in Rhodes, representing Thetis carried off by Peleus, in which the wings of Eros are painted blue, and the mantle of Thetis sea-green. The drawing of this vase is most masterly. In this and subsequent Hellenistic periods we find vases of immense size, on which are painted designs in several planes; from the absence of aërial perspective the more distant figures appear to be higher up in the picture than the nearer ones; rising ground is indicated by irregular lines of dots, but there is no attempt to represent landscape, except by conventional adjuncts, such as a single tree to represent a forest. In the later specimens of this style the drawing, though showing great facility and dexterity, is often careless and faulty, and the types are effeminate. With regard to the subjects of vase-pictures, we find in the early style a preference for scenes of war and the chase, and recognise many subjects from the Homeric and Cyclic poems; in the finest period of art these subjects still recur, together with many other myths not previously familiar to us because not celebrated in extant classical literature. Agonistic scenes were also abundant in this period. In the later style of the Hellenistic period there is a preference for more effeminate subjects taken from Dionysiac or Erotic myths. Scenes where mourners bring offering to a tomb were also common in this style. The lecturer then explained a number of drawings of vase-pictures illustrating the different periods, among which the most remarkable were the two Rhodian vases already mentioned; the Blacas vase, representing the Taking of Troy; the vase painted by Meidias, representing the rape of the Leucippidæ; Hercules in the garden of the Hesperides, and other subjects; and a composition of many figures representing a series of toilette scenes painted on the inside of a cup found in a tomb in the Crimea, and now in the Hermitage at St. Petersburg.

IRON CASTINGS.

MESSRS. STEVEN BROTHERS AND CO. the well-known ironfounders, of Upper Thames-street and Milton Ironworks, Glasgow, have brought out an "Illustrated Book of Designs of Iron Castings" of considerable bulk. An alphabetical index gives some idea of the comprehensiveness of this catalogue, which contains every kind of casting the architect or engineer can require, with sizes, and, in many instances, explanatory notes for the guidance in selection and preparing specifications. Thus, in the section devoted to rain-water guttering, the most varied sections, from the simple round to the most elaborate moulded profile, are illustrated full size and the exact dimensions given, so that a gutter may be selected to suit buildings of every conceivable class. We by no means admire all the designs, and we cannot help thinking the ornamentation is in many cases excessive. We prefer, for instance, those on pages 106, 107 to those figured on page 117, and some of the antefixæ patterns and crestings are, we think, a trifle overdone. Section II. illustrates pipes, rain-water goods, &c.; and every useful direction will be found in this part, such, for instance, that the projection of an angle bend for a rain-water pipe will be greater than a right-angle bend. A great variety of ornamental patterns for pipes and connections follow, and some of the rain-water heads shown are sensibly treated, and are designed for both Classic and Gothic buildings. Those imitating capitals, as 84, we have a decided objection to. Hot-water appliances, steam, gas, and water fittings, gratings, &c., form another section, and are well described and represented. Here the builder cannot mistake, for he has figured diagrams of every sort of siphon, elbow, and outlet he can require, and a variety of patterns for coils, though we do not admire all the elaborate coil-cases shown. The stable and cattle fittings appear as excellent in sanitary arrangement and design as it is possible for them to be, and the only objection we have to make is that the patterns are too numerous. The mangers and stable-gutters are admirable, and the plans showing stall arrangements will be found useful. Terminals and finials, vanes, &c., form another large class. As regards the designs for crestings and railings, and those for registers and chimneypieces, fewer and better-studied designs would have been preferable. In some of these the result has been to crowd ornament together without motive in design. These remarks apply, among others, to crestings, &c., Nos. 408, 530, 810, 927, 875, 885. Section VIII. illustrates railing and gate-standards, and it is a pity such poor Gothic designs as Nos. 41^s, 39^s, and 34 have been given. Newel-bars, balusters, &c., are fully treated. Passing over Section X., which deals with panels, &c., we come to a section on school-fittings. Some of the garden-chairs are suitable. Section XII. is a useful one, and treats of ranges, stoves, &c., to which some remarks are appended. Section XVI. shows a variety of designs for porches, conservatories, verandahs, &c.; and the catalogue concludes with sanitary appliances of a very complete character. Messrs. Steven Brothers appear to have spared no expense in the preparation of their catalogue to make it reliable.

THE SOUTH KENSINGTON MUSEUM.*

PARTS IV. and V. of this illustrated serial have reached us. Among the examples in the former part we notice more especially a wood engraving of the central door at the South Kensington Museum, designed by the late Godfrey Sykes. The architrave mouldings are in terracotta, executed by Blanchard and Co., and a remarkable feature are the small lizards modelled in relief in the inner hollow. The doors, in bronze gilt, were executed by the late Giovanni Franchi, and contain panels of figures in high relief representing men famous in science and art. As a specimen of architectural modelling and design it is noteworthy. The frieze in refreshment-room, designed by J. Gamble, is also clever in composition. A bronze lamp of 16th-century workmanship, of the shape of an ancient galley; a reliquary of crystal and copper-gilt, French, of the 14th century; a walnut cabinet, with some spirited carving of French workmanship; a pastoral-staff head, in ivory, of the 14th century, also French; a silver mace; an enamelled copper casket; and a marble panel, with low Italian relief figures in a group, compose the subjects of this part. In the next part we have seven etchings and one wood engraving. The frontispiece is a view across the Loan Court of the Museum, accurately drawn, but rather black. The court was designed by Capt. Fowke, R.E., and the decorations were by Godfrey Sykes. The latter are chiefly in brown, relieved by gold and blue, heightened by white. As an example of what may be done in the decoration of exposed ironwork, this Loan Court has a certain value to the architect. The iron columns, girders, and arches are decoratively treated upon their surfaces; all bolts and rivets are made ornamental details. We cannot accept the example, however, in some of the details. A vigorously-designed bronze knocker, of Venetian character and of 16th-century workmanship, is an interesting illustration; it is thought to have been the work of one of the school of Alessandro Leopardi, a celebrated bronze-worker. The design shows a mask of Medusa forming the hinge, and two dolphins forming the lower half of the knocker; the latter carry satyrs, and have serpents coiled round them. An Italian carved wood bellows of the 16th century, from the Soulages Collection, is also interesting for its spirited treatment. A Spanish gilt-metal monstrance of the same date; some ivory panels to a casket of French 14th-century design; three designs for panels, ascribed to Giovanni da Udine (16th century); and a bold Japanese eagle of iron of the same date, are among the other specimens furnished. It will thus be seen that the publishers have given a variety of subjects. The illustrations are all transferred from etched plates, and are generally accurate in drawing, and it must be acknowledged that each part is a good shilling's-worth.

THE ARCHITECTURAL ASSOCIATION EXCURSION.

THE sub-committee appointed to determine upon the district to be visited this year, and to made the necessary arrangements, have, as we stated last week, decided to visit the neighbourhood of Norwich. Mr. James Fowler, of Louth, has kindly consented to generally conduct the visits. Detailed arrangements are being made, and in order to answer as far as possible the inquiries already received, the annexed sketch programme has been prepared, and will be worked out with such modifications as may be found necessary. The number is limited to thirty. The excursion will take place in August, commencing on Monday, the 16th, and ending on Saturday, the 31st. The following is the

SKETCH PROGRAMME.

HEAD QUARTERS, NORWICH.

MONDAY.—The Cathedral and adjoining buildings, Churches of St. Peter Mancroft, and St. Stephen.

TUESDAY.—Rail to Aylsham. Carriage from thence to Cawston, Sall, and Blickling (Church and Hall.)

WEDNESDAY.—Rail to N. Walsham. Carriages from thence to Trunch, Knapton, Edingthorpe, Bromholm Priory, and Worstead.

THURSDAY.—Rail to E. Dereham and Fakenham. Carriages to E. Barsham Hall.

FRIDAY.—Rail to Wymondham. Carriages from thence to Attleborough, Great Ellingham, Hingham, and Deopham.

SATURDAY.—St. Andrew's and Stranger's Halls. St. George's and St. Giles's Churches, &c., Norwich.

OUR ANCIENT MONUMENTS.*

IN a pleasant, chatty style, Mr. Jackson has undertaken to illustrate the Ancient Monuments scheduled in the Bill of Sir John Lubbock, who furnishes a brief introduction to the volume. Owing to adverse influences the list is very imperfect, Cornwall being wholly omitted. Prehistoric times admit of large speculation, and it appears that archæologists are not yet quite at accord with regard to the nomenclature. Thus we have four epochs:—

1. The Drift, for which Sir John Lubbock proposes the name Palæolithic.
2. The Stone Age, which receives from the same hand the synonym of Neolithic.
3. The Bronze, and
4. The Iron.

The monuments are "Tumuli, Menhirs, or Standing Stones, Dolmens, or Stone Chambers, Stone Circles, and Stone Rows or Avenues." Mr. Jackson's spelling of *Præ*-Christian and *Præ*historic we would hope are misprints; but he certainly confuses the meaning of an important word; we read of "no less than thirty cromlechs or altar-like groups of stones," but on the opposite page are perplexed to find this sentence, "we propose to confine" [the name Cromlech] "to circular monuments;" and in the appendix, "our popular use of the words dolmen and cromlech ought to be reversed; and while the former word accurately describes the so-called altar-stone, the latter better suits the case of stone circles." There are other similar slips, but we prefer to turn to the more kindly view of an agreeable though superficial work, which, if less popular and more solid, would have been the better if moulded on the model of the admirable articles published in the *Journal* of the Royal Antiquaries of the North, at Copenhagen. Mr. Jackson's essay on Old Sarum, its cathedral, and the new minster in the Vale of the Avon is *ultra vires*, but he gives us some new and acceptable information in "the evidence existing of purposed church erections on the site of rude monuments of an earlier period. Thus, in the tenth century, we find Patrick, Bishop of the Hebrides (?) desiring Crlygus to found a church where he should find three upright stones. The church of Benachie, in Scotland, is built in a Pagan stone circle. Rudston and Ruthwell (?) pillars would appear to be incorporations of stone monuments with subsequently erected churches, and so also would appear to be pillars in the Abbeys of Downpatrick and St. Thomas, Dublin, respectively." It the light of St. Gregory's instructions to St. Augustine, not to destroy, but to consecrate, the earlier places of worship, the subject might well be pursued further, and made to possess a wider interest. The illustrative woodcuts, though somewhat coarse, give a rough but effective idea of the monuments which they represent. Whilst the legendary and controversial literature of the subject has not been sparingly used, the tone of the author is reverent in a degree, remarkable in the sneering style of the period; but in the discussion of the pretensions of Tara, and the assumptions of Mr. Fergusson, an undertone of playful criticism relieves the drier matter. The book is nicely printed, and deserves our recommendation as a trustworthy and convenient handbook to the remarkable antiquities which led to its composition, and a useful companion in their summer wanderings to home tourists who care to see "Some rare note-worthy objects in their travel."

BOOKS RECEIVED.

Notes by Mr. Ruskin on Samuel Prout and William Hunt (London: Fine Art Society) is an illustrated edition of Mr. Ruskin's notes on the extremely interesting collection of pencil and water-colour drawings, opened in November last, at the Fine Art Society's Gallery in New Bond-street. We reviewed the drawings, and Mr. Ruskin's notes on them, on p. 603. of Vol. XXXVII., and have only to add here that the twenty autotypes render this edition tenfold more valuable and interesting.——*Great Industries of Great Britain* (London: Cassell, Petter, and Galpin) has completed another volume. Numerous illustrations, and, as far as we can judge, accurate information, by competent authorities, render the series a very valuable work of reference.——*Practical Boat-Sailing for Amateurs* (London: The *Bazaar* office) contains particulars of the most suitable sailing-boats and yachts for amateurs, and instructions for their use.——*Electric Light: Its Production and Use*; by J. W. Urquhart, C.E., edited by F. C. Webb, M.I.C.E., M.S.T.E. (London: Crosby Lockwood and Co.), is not a very satisfactory book. The author seems to have been anxious to save his readers from the trouble of arriving at a thorough knowledge of the theory of his subject, and the result is, that occasionally one is forced to conclude that some of the statements made in the book are the fruit of that sort of "practical" experience which, disdaining the study of principles, degenerates into rule of thumb work. Still there are many useful suggestions on details in the book, and the illustrations are always good and nearly always accurate.

CHIPS.

The first portion of the enlargement of Aston church is now completed, and was opened on Tuesday week. This portion consists of an extension of the nave and aisles in an eastward direction, over the site of the old chancel. It was commenced rather more than a year ago. It is proposed to proceed next with the chancel.

A new court-house for the Broxton petty sessions has been erected from the designs of the county surveyor of Cheshire (Mr. Stanhope Bull). The building is in bright red brick, and the style followed is Early English. It consists of a superintendent's residence, constable's house, police-station, lockup, with three cells, a spacious and well-arranged court-house, and all necessary offices. The contractor is Mr. Howard, of Hazelgrove.

A parish meeting was recently held at Dartmouth for the purpose of considering two schemes for the repair and improvement of St. Saviour's Church, which has been permitted to lapse into a state of dilapidation. Mr. Thomas Lidstone, diocesan surveyor, presented a report, and estimated the cost of the work at £4,356. A second report and plans were presented by Mr. Edward Ashworth, architect, of Exeter, who estimated the expense at £3,878. In the event, the latter plans were adopted by the vestry. Mr. Ashworth stated that he proposed to clear away the west gallery and all the "cradle work," place the organ in the north chancel-aisle, restore the roofs and tower, reseat the church, renew the windows, provide hot-water apparatus, re-light the church, and remove the altarpiece to the west end of the church against the northern wall, and substitute for it a reredos.

On the 24th ult. the foundation-stone of a new church at Four Elms, Kent, was laid. The external facing will be of Limpsfield stone, while the quoins, window, and other dressings, and the internal facing, will be of Bath stone. Messrs. Punnett, of Tonbridge, are the contractors, and the architect is Mr. Edwin T. Hall, of 57, Moorgate-street, London.

The vestry of St. George's, Hanover-square, have decided to enlarge and extend the public baths in Davies-street, Berkeley-square, at a cost not exceeding £2,500.

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* The South Kensington Museum: Examples of the Works of Art in the Museum, &c. London: Sampson Low, Marston, Searle, and Rivington.

* Our Ancient Monuments, and the Land around Them. By C. P. K. JACKSON. London: E. Stock. 1880.

ARCHÆOLOGICAL.

ANCIENT BRITISH INTERMENTS IN BERKS.—The neighbourhood of Lambourno, in Berkshire, is rich in remains of prehistoric times, including the great camp at Uffington, with the well-known figure of a horse rudely cut out in chalk on the hill-side. Not far distant is Wayland Smith's cave, a sepulchral chamber with a gallery, once covered by a large mound, and representing the earliest form of burial-place with which we are acquainted in Britain: This relic of past ages is made celebrated by Sir Walter Scott in "Kenilworth." Local antiquaries would gladly attach to Ashdown (now the property of the Earl of Craven) Alfred's famous battle of Æscesduno, but it is still a disputed point as to whether the engagement was really fought there, many antiquaries considering it scarcely possible. However, there is in the neighbourhood a large group of barrows (numbering nearly 30), to which the name "Seven Barrows" is given, and which were partly examined about 30 years ago. Some other barrows in the neighbourhood have lately been explored by Canon Greenwell, F.R.S., of Durham, author of "British Barrows," being asociated in his researches with Mr. W. Money, F.S.A., of Newbury. Three or four barrows which were examined proved to have been opened and completely rifled in times long past, but among these was a small one that still contained the broken fragments of a fine cinerary urn, which, when discovered, had been broken and scattered about by the first explorers. A single jet bead, no doubt the remains of a necklace, had escaped the eyes of these people. The first untouched barrow met with was in the parish of Childrey, on the edge of the down overlooking the White Horse Vale. Just to the south-cast of the centre was a large Sarsen stone, and going down at its side was a circular grave, excavated in the chalk, 2½ft. in diameter and 1½ft. in depth. It was nearly filled with charcoal, the remains of the funeral pile upon which the body had been burnt. Interspersed among the charcoal were the burnt bones. In the barrow, not connected with the interment, were a flint scraper and an arrow-point of flint, of a type very rare in England, but almost the commonest in Ireland. The next barrow examined was in the parish of Letcombe Bassett. It was a large one, and it had been a good deal levelled by the action of the plough. Badgers had at one time burrowed in it, and the skeletons of two of these animals were found. Some of the burnt bones which the barrow contained had been burrowed through by the badgers, and dispersed about, and with the burial had been a carefully-worked barbed arrow-point of flint. The central and original interment—that of the burnt body of a woman—had been in a deep and narrow grave excavated in the chalk. The bones were perfectly free from any admixture of earth or charcoal, and were beautifully white in colour. No implement, ornament, or pottery, had been buried with the body. The last barrow, at Stancombe, in the parish of Lambourne, produced exceptional results. In the material of the mound, but not connected with the burial, were a bone pin, and a small vessel of pottery about 2in. high, ornamented with vertical lines made by the puncture of a sharp-pointed instrument. At the centre, in a shallow grave, scooped out of the surface soil, were the burnt remains of a man, and lying on the top of them was a most symmetrically-formed, perforated axe-hammer of stone, one of the finest yet discovered. It has been presented to the British Museum, where the valuable collection of articles previously discovered by Canon Greenwell are preserved. Side by side with this hammer was a second hammer made from the burr-end of a red deer's antler. It is very well formed and larger than usual. Canon Greenwell has discovered two previously, one in Yorkshire and one in Westmoreland, and is of opinion that these implements have been used as weapons of war. Close by was found an "incense cup" of globular form, ornamented on the upper part with zigzag lines, and perforated just below the rim with six holes in pairs. At the side of the deposit of burnt bones was a small bronze knife, with a tang for insertion into the handle. This article presents another instance of the concurrent use of stone with bronze, and therefore possesses more than usual interest.

NORFOLK ARCHÆOLOGICAL SOCIETY. — The annual excursion of this society took place on Wednesday week, the district visited being that between Norwich and Bungay, notes on the buildings visited, prepared by Mr. R. M. Phipson, being read in his absence by the Rev. C. R. Manning, who supplemented them with further observations. Leaving Norwich by carriages, the Early Decorated church at Woodton was the first building inspected. There is no chancel arch or break in the main-roof from east to west; the 14th-century piscina, sedilia, double aumbry, stairs to roodloft, and hagioscope remain, and at the east-end of south-aisle is one of the most beautiful Decorated windows in the country. At Hedenham were seen the Elizabethan brickwork of the old hall and the parish-church, an Early English and Decorated building which Mr. Phipson described as "Another case of over-zealous and mistaken restoration. Beddington Church, the next one visited, is more interesting, having a circular west tower of the 13th century, to which an octagon stage has been subsequently added. The chancel is Transitional Early English, and has good south priest's door with dogtooth mouldings and large four-light east window, of this period. The nave and aisles are Decorated and Perpendicular in character, and some of the ancient benches have male poppy-heads on the north side, female heads on the south. In Darrow Wood, the Castle-hill, a small artificial eminence, moated round, was examined. In opposition to Mr. Alfred Suckling, who had suggested that it was a Danish art work, the Rev. C. R. Manning considered it marked the residence of a Saxon thane. At Denton, the fine church, with good ancient stained-glass in the Decorated east window, was examined, and from thence the members drove to the church at Earsham, which contains some Early English work and a rich Late Perpendicular font, sculptured with the seven sacraments, and some old Flemish stained glass. The day's excursion closed amidst the ruins of Bungay Castle.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

ARCHÆOLOGICAL INSTITUTE OF AMERICA.—The first annual report of the Executive Committee, presented at the annual meeting of the Institute, held in Boston May 15th., shows the number of members to be 122, of whom 15 are life members. The first volume of the Transactions of the Institute, about to be issued, will contain a paper on "The System of House-Building practised by the Indians," by the Hon. Lewis H. Morgan: "Archæological Notes on Greek Shores," Part I., by Mr. Joseph Thacker Clarke, whom the Institute assisted with funds in the prosecution of his archæological researches; and a report by Mr. W. J. Stillman, on the walls of Monte Leone. As part of the future work of the Institute, the Executive Committee proposes to send an expedition to Colorado and New Mexico, for the purpose of studying the life of the Indians there located, with a view to the determination of many unsolved questions in American archæology, and to explore a site in Greece, selected after consultation with Prof. Ernst Curtius. The establishment of scholarships of archæology at Harvard, Yale, Columbia, and other colleges, and of an American archæological school at Athens, is also urged by the committee.

COMPETITIONS.

CARDIFF.—The site of the old theatre and some adjoining land in this town is proposed to be utilised by the erection upon it of a public hall, shops, and chambers. The architects of Glamorganshire have been invited to send in plans and specifications showing means of dealing with the area, and a small premium is to be paid to the author of the selected plan.

LIVERPOOL.—There is to be a Conservative club-house built in Liverpool, and Mr. A. Waterhouse has been there arranging terms for a competition, to be confined to local architects. We understand that no architect will be allowed to compete unless he is a member of the proposed club, or can make a declaration of Conservative faith. The site is in Dale-street, at the corner of Sir Thomas's-buildings, and opposite the municipal buildings.

WESTMINSTER.—A meeting of the Westminster vestry was held on Wednesday, when the proposal originally made to confine the report of the professional referee, Mr. Charles Barry, to three designs selected by the committee, was set aside, and it was determined that Mr. Barry should report on all the designs submitted, and that his fee should be increased from fifty to a hundred guineas.

CHIPS.

New schools built at Twedidland and Dobwalls were recently opened by the Liskeard School Board. They are Queen Anne in style, with some gable framing and half-timber work, and have Bridgwater brick facings and dressings. The cost of the first-named school, which accommodates 80 children, was, including master's house, £649, and that at the Dobwalls school £372. Mr. Skentelbery, of Looe, was the architect, and Mr. Whale, of Liskeard, the contractor.

Mr. George Jacob Holyoake, who recently visted the United States, speaks rather severely of the cities from an architectural point of view:—"If an architect in each city could be hanged now and then with discrimination, what a mercy it would be to mankind."

The Cork town council received and considered on Friday a report from the Artisans' Dwellings Improvement Committee with reference to the progress of the scheme. It was stated that since September last the committee had considered three out of five "unhealthy areas," and had decided to first improve that near Stephen-street, known as No. 1, as an experiment. Mr. M'Mullen, C.E., was appointed engineer of the scheme, and Mr. Walker the official valuer, the latter of whom so satisfactorily conducted the purchase negotiations that comparatively few of the interests scheduled in No. 1 area came before the arbitrator for settlement. Having now obtained possession of nearly all the tenements, the committee had instructed Mr. M'Mullen to demolish the properties, and a clearance of the site was nearly completed. Some progress had been made with No. 2 area, the arbitration for which would soon be held, and No. 3 had also been commenced. The total cost for them had been £2,852, out of the £35,000 loan which had been sanctioned. The report was adopted.

The Brighton town council, on Wednesday week, finally approved the specification and contract drainings prepared by the borough surveyor for the new fence on the Marine parade, and appointed Mr. Willian Parsley clerk of works during its erection, at a salary of £3 3s. per week.

A Congregational chapel, Byzantine in style, was opened on Wednesday week at Bryn Sion, Lampeter Velefrey. The plans were prepared, and the building was erected at a cost of £880, by Mr. John James, of Whitland.

Foundation-stones were laid at Bovey-Tracey, Devon, on Monday week, of a new Wesleyan chapel about to be built at a cost of £600. Mr. J. R. Cull, of Newton, is the architect, and the contractors are Messrs. Aggett and Underhill, of Chagford.

The Bristol and Gloucestershire Archæological Society will hold their annual meeting at Stroud on Wednesday next, the 21st inst., and two following days.

The 16th half-annual report of the Cork City Improved Dwellings Company, Limited, just presented to the shareholders, states that the revenue account shows a net balance and profit of £454 6s. 8d. on the half-year, which enables the directors to declare a dividend at the rate of 6 per cent. per annum on the fully-paid shares, and also to pay 5 per cent. on calls on new shares, and to carry forward £15 12s. 1d. to the reserve account which will then stand at £594 0s. 5d. The work of building is progressing satisfactorily at Rathmore, Richmond-hill, and 54 of the company's new houses are now occupied.

A new police-station is about to be erected at Hollington, near Hastings, and three police-cottages, with cells, at Eastbourne, for the county magistrates, from the designs and plans of Mr. Henry Card, of Lewes.

The Royal Agricultural Society is this week holding its annual show at Carlisle. The whole of the shedding has been erected under contract by Messrs. Thomas Penny and Co., of Taunton, and covered with canvas by Messrs. Unite and Son, of Edgware-road, London. The work, together with the erection of temporary bridges, levelling and draining of site, and laying on of water supply, has been carried out under the supervision of Mr. McKie, the city surveyor, who has been appointed engineer to the local Show committee.

The Bath town council, after a discussion and division, resolved on Tuesday week to raise the salary of Mr. Gilbey, assistant city engineer, by £20 per annum.

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ILLUSTRATIONS.

NEW BOAT-HOUSE, OXFORD.—UNIVERSITY COLLEGE STATE BARGE, OXFORD.—HOUSES IN CADOGAN-SQUARE.—HOUSE AT CAMBRIDGE.—CHIMNEY-PIECE, ASTON HALL.—INTERIOR OF ST. PAUL'S CATHEDRAL, MELBOURNE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

UNIVERSITY COLLEGE BARGE AND BOAT-HOUSE, OXFORD.

The barge here illustrated was built for University College, Oxford, about a year ago, by Mr. Saunders, of Streatley, and Mr. Dodd, of Caversham, the former taking the hull, and the latter, the house; it cost about £950 in all. The interior consists of a good club-room, a dressing-room, and other accommodation. The boat-house is now being built for the Oxford University Boat Club by Mr. Silver, of Maidenhead. The lower story consists of the boat-house proper, about 70ft. square, giving accommodation for some forty eights and other boats. There is a workshop, &c., behind. Above these are three club-rooms, with dressing-rooms, bath-rooms, &c., and, in the roof, a residence for the keeper. The cost will be about £2,600. The architect in each case was Mr. J. Oldrid Scott.

HOUSES, CADOGAN-SQUARE.

These houses, which form part of a long terrace of similar buildings, are from designs furnished by A. J. Adams, architect, 18, Queen's-road, Bayswater, W.; and they were built by Mr. T. Pink, of Hans-place and Cadogan Estate. Dark and light bricks, mixed indiscriminately, have been used for the external walls, the cornices, strings, moulded work, and carved portions being of light red rubbers, gauged in putty. The principal stairs, and also the floors, as well as the doors of the reception-rooms, are executed in oak. The chimney-pieces throughout are Queen Anne in character, and are made of oak, marble, and tiles. The brick-carving was executed by Mr. John M'Cullock, of Kennington Park.

HOUSE AT CAMBRIDGE.

This house has been erected at Cambridge for Mr. F. W. H. Myers, from the designs of Mr. W. C. Marshall, M.A., architect.

CHIMNEY-PIECE AT ASTON HALL, WARWICKSHIRE.

This is a reproduction of one of a series of drawings illustrating this mansion, and for which the Institute recently awarded their silver medal and premium. The house was built between the years 1618—1635, and the room in which this fireplace occurs is the principal apartment, excepting the gallery, on the first-floor. It is a handsome room, 39ft. by 23ft., and 17ft. high, lighted at each end by large mullioned and transomed windows, and the fireplace occupies the centre of one side. It is executed in a fine white stone, with two boldly-projecting panels of black marble. A portion of the fine plaster frieze is also shown. The complete set of these carefully-detailed and interesting drawings will be published very shortly by Mr. Rimell, of Oxford-street, the author of the entire work being Mr. W. Niven, architect, of Parkhurst, Epsom, whose etchings of old Warwickshire houses we noticed some short time since.

ST. PAUL'S CATHEDRAL, MELBOURNE.

The foundation-stone of St. Paul's Cathedral, Melbourne, of which we give an interior view to-day, was laid on April 13th. Since the design was originally received from Mr. Butterfield, the situation of the cathedral building has undergone an alteration. It was at first proposed for the structure to occupy the present site of St. Paul's Church and parsonage, and to leave the schools untouched. It would then have stood nearly east and west, and have been parallel with Flinders-street. Subsequently, it was deemed desirable to have the building parallel with Swanston-street, or nearly north and south, as that gave greater length to the site, and allowed for additional extensions, if these were in time found to be necessary. Orientation has thus been abandoned. The extreme external length of the building when completed will be 273ft., and its extreme width 126ft. The eastern end will approach to within 18ft. of Flinders-lane, but as the sill of the chancel-window will be elevated 45ft. above the pavement, its close proximity to the street will not be objectionable. The general plan of the building is an irregular cross. The south transept will scarcely project at all beyond the line of the aisles, but the north transept will be constructed much deeper to accommodate the organ. The internal dimensions will be as under:—Nave and aisles, from the west door to the piers of central tower, 164ft. by 65ft.; north transept, 35ft. by 21ft.; south transept, 35ft. by 29ft.; central tower, 43ft. by 43ft.; and chancel, 48ft. by 37ft., making the total length of the choir 91ft. There will be three main entrances, the principal being from Flinders-street by the central door; the other two will be by means of doorways under each of the western towers. It is not proposed to have the central doorway open on general occasions, as it would expose too directly the interior to the street. The floor of the nave and aisles will be raised several steps above the street, and from the floor of the nave to that of the altar will be the usual ascent of seven steps. The piers of the nave will be clustered columns, with somewhat depressed pointed arches to carry the clerestory walls. The great central tower will be carried by four massive piers with clustered shafts, and be open to the interior for a height of 100ft., at which level a panelled wood ceiling will be placed. At a height of 70ft. from the floor there will be a stone gallery all round, with an iron railing. The roofs of nave and chancel will be constructed alike, and carried by principals, with curved ribs springing from the caps of polished granite corbel-shafts. The ceiling will be cradled in a polygonal form, with moulded ribs, and have a total height of 75ft. in the clear. The aisle-roofs will be of the usual lean-to section, but of a slightly flatter pitch than that of the nave. Th building is designed externally in th Decorative style of Gothic. The prin cipal features will be the two western towers and the great central tower and spire. The two former will have gabled roofs, with crosses reaching to an extreme height of 130ft. from the ground. Between these western towers will be the large central doorway, and over this a five-light traceried window, the upper part of the central gable being filled with blank arcading, with a cusped vesica in the centre, inclosing a cross in alto-relievo. This vesica form, it may be mentioned here, is used frequently throughout the designs. It is introduced in the centre of the reredos tracery, and the windows of the south transept are of the same form. The spandrels over door and window, and the gables of the western towers will be richly diapered. The total height of the nave and chancel-roofs will be 93ft. from the surface of the ground; the transept roof will be several feet lower. The great central tower will be square, 43ft. by 43ft. (external dimensions), until it reaches above the ridge of the nave-roof, when it will be reduced by a broach to an irregular octagon, leaving the four principal sides about double the width of the broached sides. Each face on the design is filled with geometric tracery, that in the four principal faces being opened and louvred, and that on the other four faces blanks. At a height of 153ft. from the ground there will spring from this tower an octagonal stone spire, reaching to the vane to a height of about 275ft. This spire will be enriched by escalloped bands at intervals throughout its height, and will be surmounted by a metal cross and weathercock vane. Permanent seating accommodation will be provided in the nave and aisles for 1,300 persons, but on special occasions provision will be made for 2,000. The choir will seat 50 singers. The original estimated cost of the entire building was £100,000, but as the scale of the building has been considerably increased, it may be assumed that the cost will be proportionately increased. The usual vestries and chapterhouse accommodation will also be provided. Messrs. Terry and Oakden, architects, are in charge of the complete works, with Mr. Harrison, of Prahran, as clerk of works. Mr. Terry has recently been in England, and while there consulted with Mr. Butterfield as to the preparation of the working drawings. The only contract at present let is to Mr. W. Smith, of Collingwood, for the construction of the foundations and the walls up to the level of the floor, and the piers to a height of 12ft. 6in. above the nave-floor. As these piers will eventually have a great weight to support, their construction is being proceeded with in advance of the work, so that a firm settlement may be secured. The bottom course of each pier consists or four very large stones. In the case of the first pier, two stones have been obtained of sufficient size to answer the purpose, and it was one of these stones which was laid at the ceremony. It was 14ft. long, and nearly 6ft. wide, and weighed over nine tons. We are indebted to the *Australasian Sketcher* for the above particulars and view. A complete set of the geometrical designs of the building, from Mr. Butterfield's own plans, were published by us in May last year.

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CHIPS.

Richard Littlejohn, aged 25, and described as a builder, living at Choumert House, Choumert-road, Peckham, was, together with one Jane Ellen Bentley, committed for trial at the Old Bailey sessions, by Mr. Chance at Lambeth police-court, on Tuesday, on a charge of having illtreated George Bentley, 84 years of age. The case for the prosecution is that the old man, having become imbecile, was locked up in a room, without proper care or attention.

A new grammar-school is about to be built on the West Hill at Hastings, from the designs of Messrs. Jeffery and Skiller, of that town.

The Holborn board of guardians decided, last week, to erect, on the site of the Farringdon-road workhouse, a new workhouse for 400 aged and infirm, and 100 acute sick, people, and also a board-room, dispensary, and relief offices. The estimated cost is £30,000.

Mr. J. G. Brown, of Sunderland, has been appointed assistant surveyor to the town council of that borough, at a salary of £180 a year.

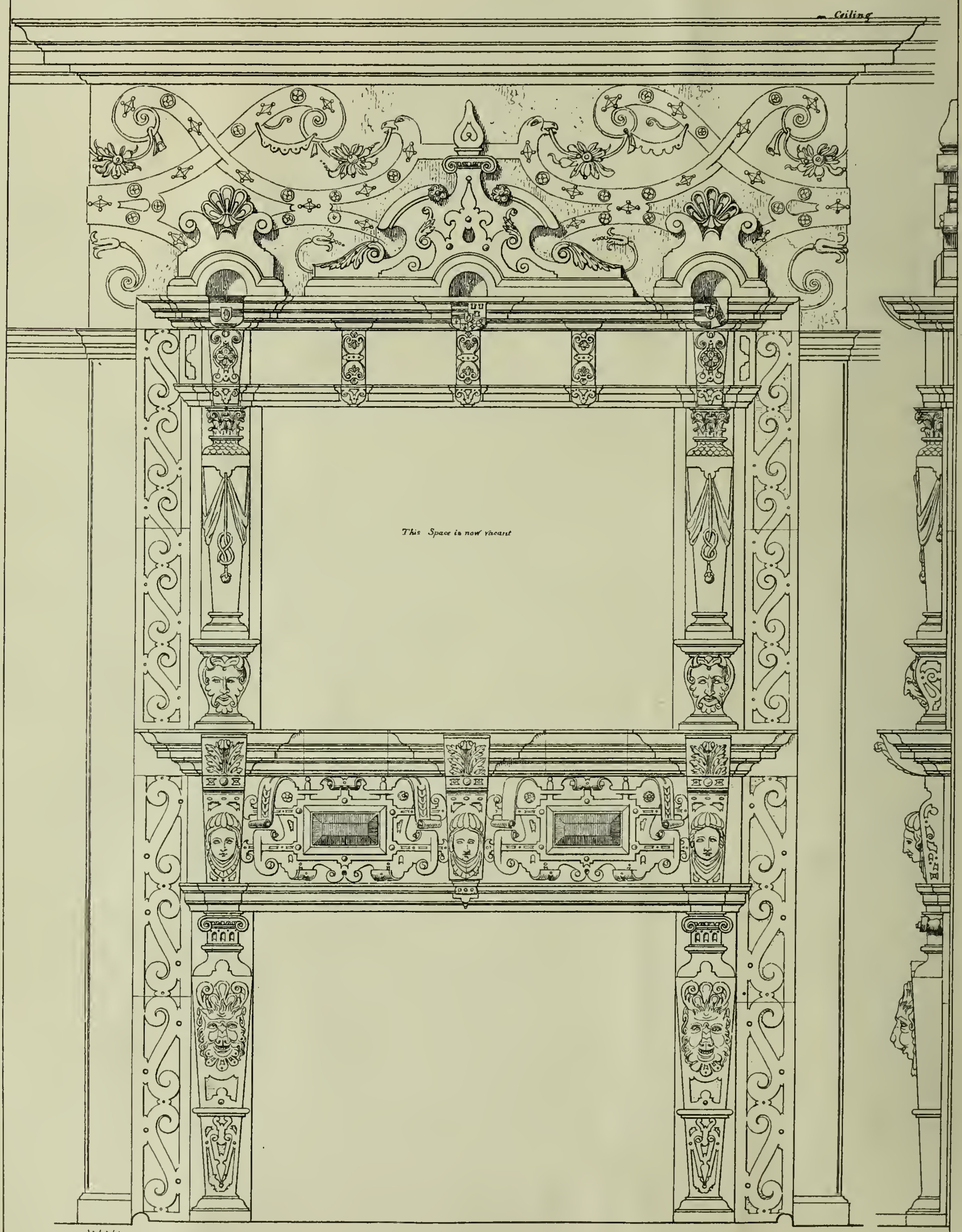
The local board for Brandon and Byshottles, Durham, met on Monday week to appoint a successor to Joseph W. Spoor, late surveyor and inspector of nuisances to this and other boards, who has absconded, after committing defalcations. Sixty-eight applications were received, including one from Mr. Richard Gardner, builder and contractor, of Langley Moor, a member of the board, who is reported to have kept his seat at the table during the reading of the testimonials. The subsequent proceedings appear to have been merely formal, for only Mr. Gardner and Mr. John Shaw, surveyor to the neighbouring local board of Sutton, were nominated, and the former candidate was elected, by 4 votes to 2. Mr. Gardner, in returning thanks for his election, expressed a hope that he should make a better servant than member of the board.

St. Mary's parish-church, Bury St. Edmunds, was reopened on Friday, after the removal of the galleries over the north and south aisles, and repairs to the walls and columns. The work was carried out by Mr. L. Jackaman, builder, of Bury. It is proposed to place several stained-glass windows in the aisles, and to rebuild the chancel roof.

A new infants' Board-school is about to be built in Manor-road, Hastings, from the plans and designs of Mr. T. Elworthy, architect to the board.

Memorial-stones of a new Wesleyan chapel and schools were laid at Princetown, Dartmoor, on Wednesday week. The site was used as a market when the French prisoners of war were confined in the neighbourhood. The chapel will seat 320, and the schools and class-rooms 200. Mr. Snell is the architect, and Mr. Fudge the builder. The outlay will be £1,200.

THE BUILDING NEWS, JUL 16 1880

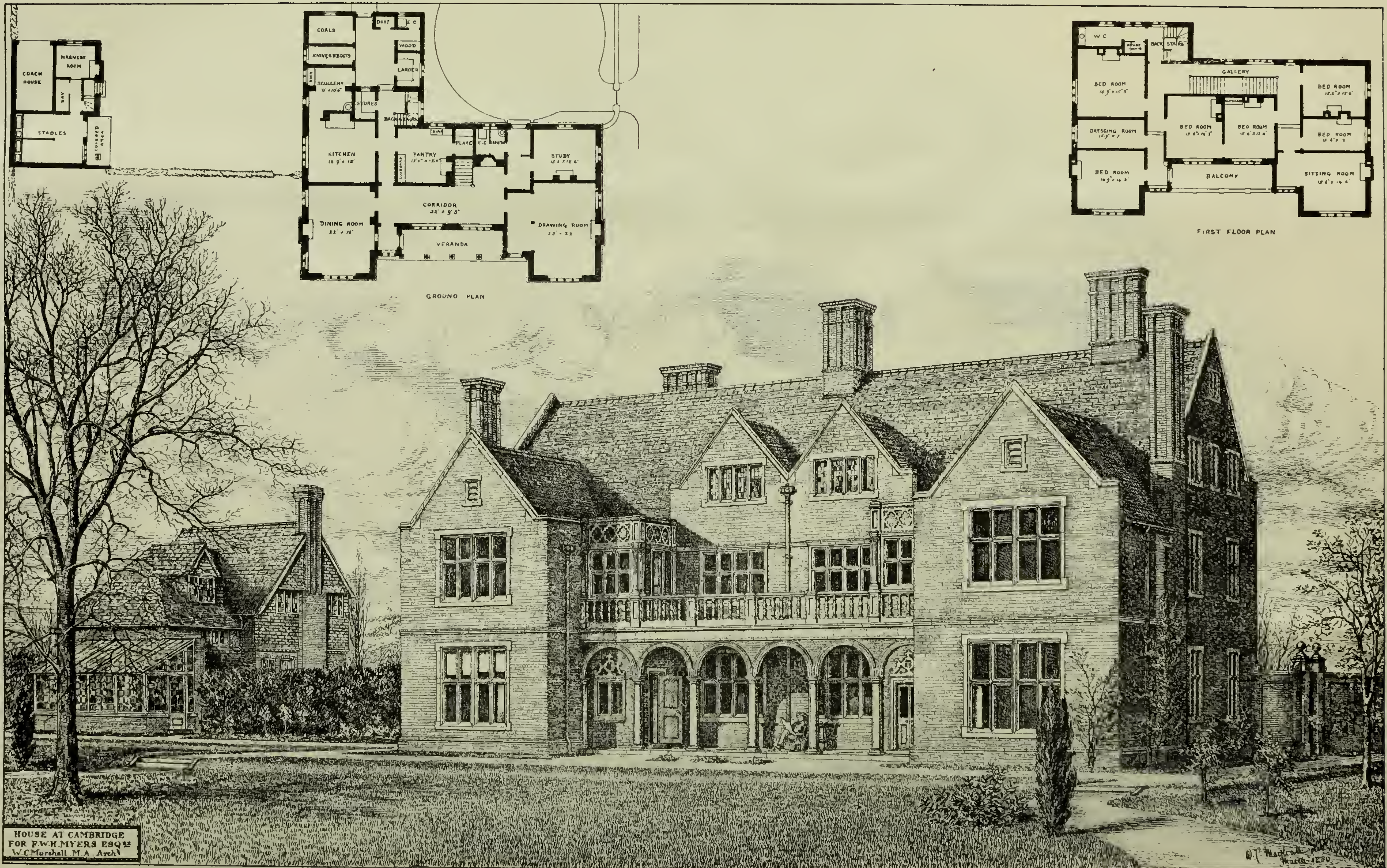


CHIMNEY-PIECE IN THE GREAT-CHAMBER

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

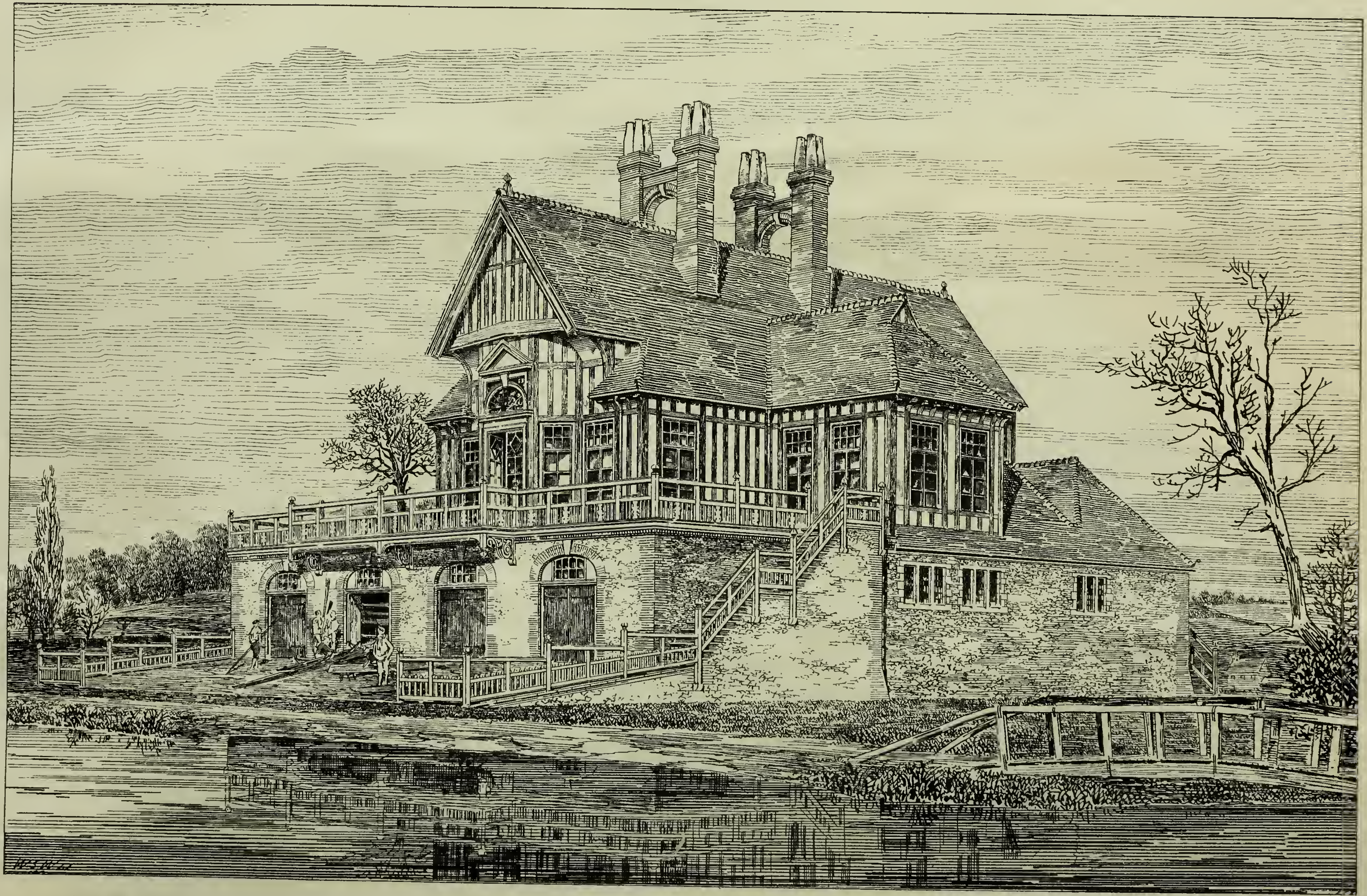
ASTON HALL.

THE BUILDING NEWS, JUL. 16 1880



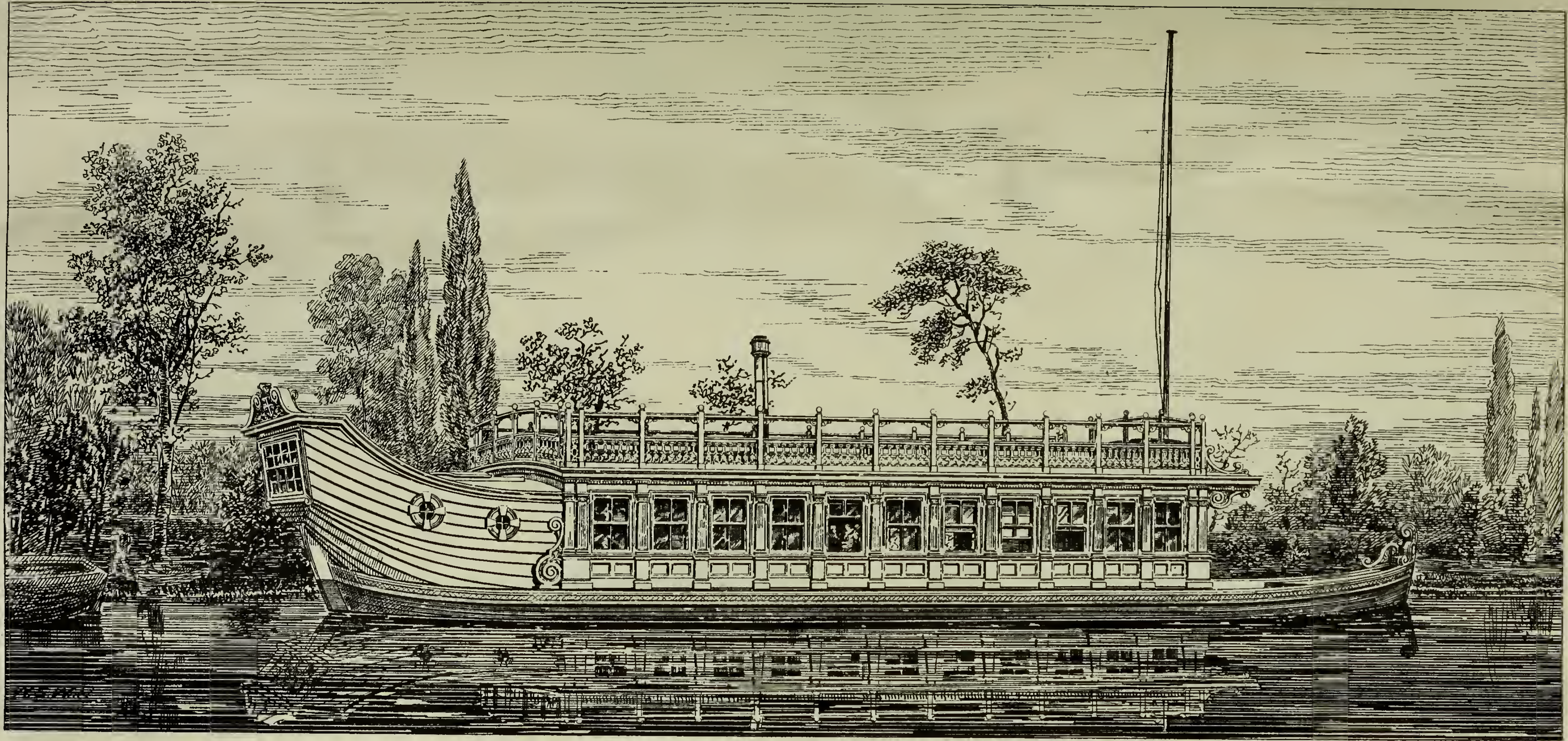
HOUSE AT CAMBRIDGE
FOR F.W.H. MYERS ESQ^RE
W.C. Marshall. M.A. Arch^t

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C



NEW BOAT HOUSE OXFORD, FOR THE UNIVERSITY OF OXFORD BOAT CLUB. *John Oldrid Scott*, Architect.

THE BUILDING NEWS, JUL. 16 1880



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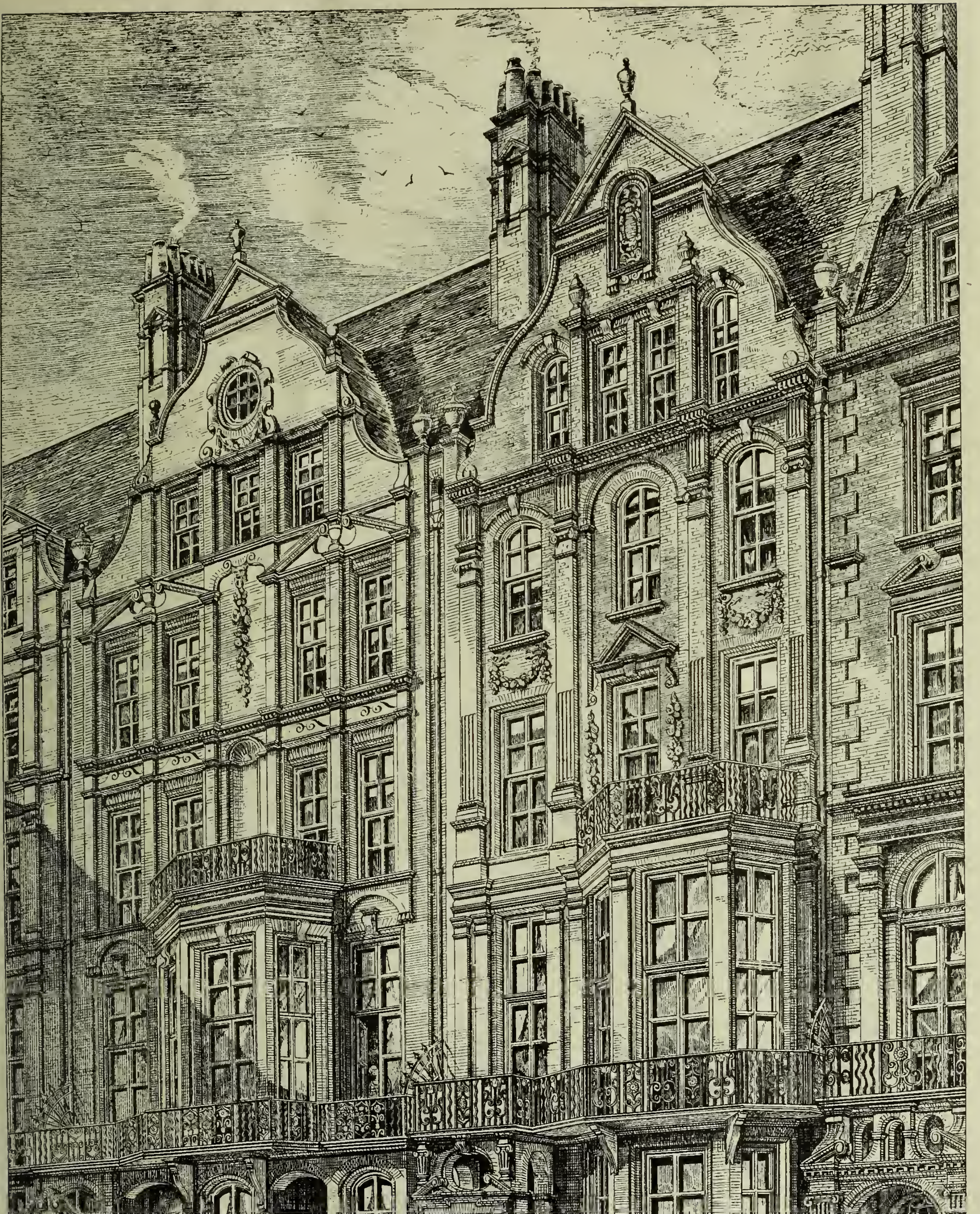
University College State Barge Oxford *John O. Scott Archt.*

THE BUILDING NEWS, JUL. 16 1880



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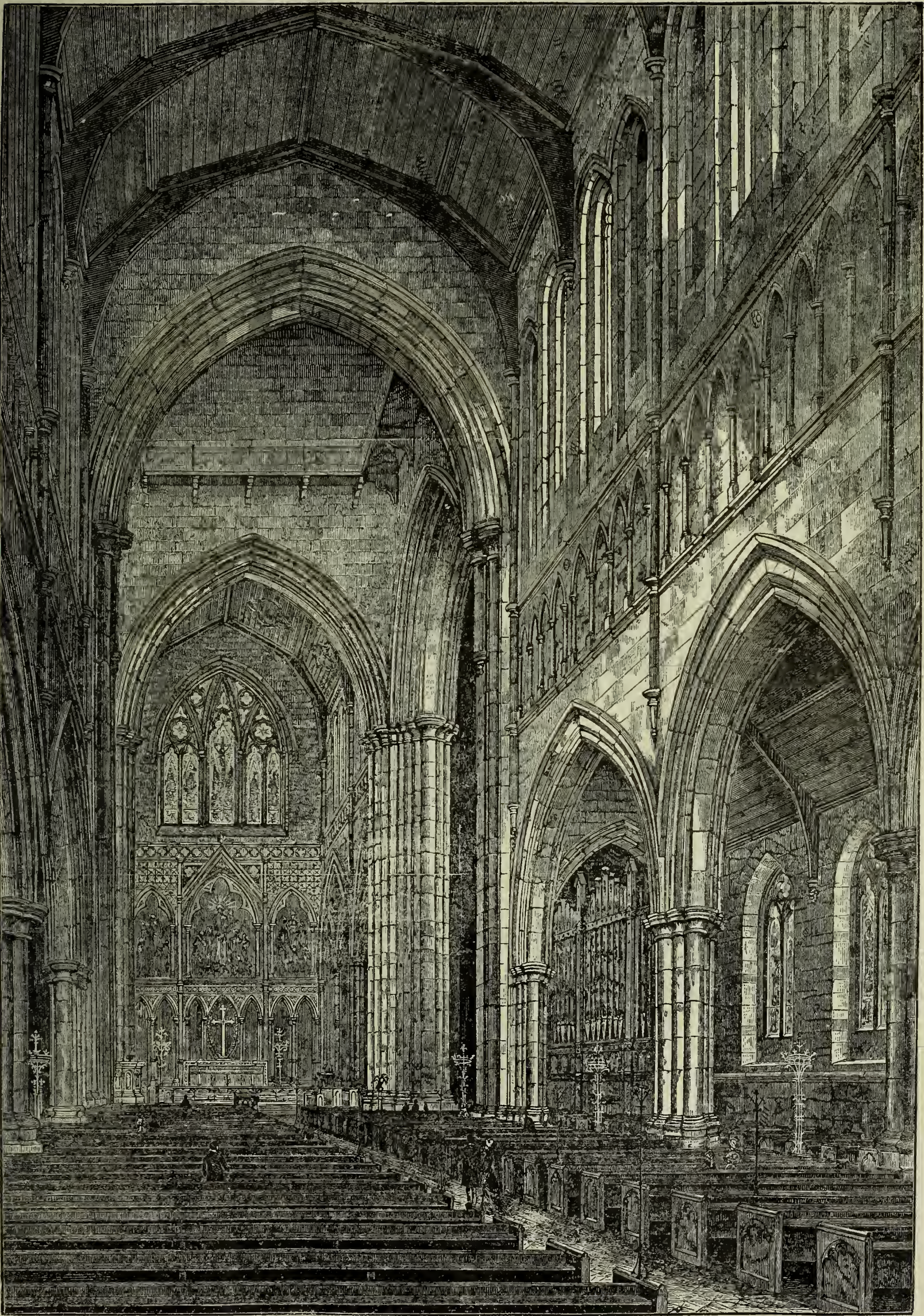
HOUSES, CADOGAN SQUARE.

A. J. ADAMS ARCHITECT



Wm Butterfield, Architect.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

St Paul's Cathedral, Melbourne.

Building Intelligence.

Aberystwith.—On Wednesday week, the new Welsh Wesleyan Chapel in this town was opened. The new chapel will seat between 800 and 900 persons, and measures, internally, exclusive of vestibule and vestry, &c., 72 feet 6 inches by 40 feet wide, and 32 feet from floor to ceiling. There is a gallery round three sides, with an organ-gallery in the south end, circular in plan, with coved ceiling, with ministers' vestry and committee-room underneath. The principal elevation is in the Corinthian style of architecture. The cost of the building and site has been about £4,000, and the whole of the works have been executed by Mr. Thomas Jones, builder, Dole, Aberystwith, with Mr. David Williams as clerk of works, from the plan and specification, and under the superintendence of Mr. Walter W. Thomas, architect and surveyor, Liverpool and Aberystwith.

Knowle.—Last week the new church of St. Thomas, Nuthurst-cum-Hockley-heath, near Knowle, was consecrated. The total cost of the church, exclusive of the site, has been about £2,200. It comprises a nave 53 feet long by 24 feet nine inches wide, a chancel, a south porch, an organ-chamber and choir vestry also on the south side, beneath the vestry being situated the heating chamber. A tower, crowned with a belfry and spire, rises at the angle formed by the nave and chancel on the north side. The building is erected chiefly in red brick, with Bath and Wrexham stone dressings to the window tracery, sills, copings, &c. Moulded bricks and brick diaper work and banding are also freely used. The interior of the walls is lined with pressed buff-coloured bricks, with which red-pattern work is intermixed. Accommodation is provided for a total of 202 worshippers. The corbels to the nave-roof principals and to the chancel-arch and other portions of the work have been carved by Mr. Roddis, of Birmingham. Early Gothic is the style followed. Mr. John Cotton, of 15, Temple-row, Birmingham, prepared the designs for and superintended the erection of the church. The contractors are Messrs. J. Barnsley and Sons, of Birmingham.

Lea, Wilts.—The hamlet-church of Lea, near Malmesbury, was reopened on the 1st inst., after restoration from the designs of Mr. C. J. Phipps, F.S.A. The building, which consisted of 13th-century nave, and square west tower, was "restored" in 1840; but, four years afterwards, it was considered unsafe, and since that time, services have been held in a school-room. The building has been rebuilt, with the exception of the east wall, which has been underpinned, and the tower; a north aisle has been added, and the tower opened out to the church, increasing the sittings from 120 to 220. The work has been executed in Garsdon stone, with Bath-stone dressings, the interior being also lined with Bath stone. The roofs of both nave and north aisle are open with match-boards at back of principals, all of varnished deal, and covered with Staffordshire tiles. The floor of the church is of Forest stone, the chancel being laid with Minton's tesselated tiles, while inside the Communion-rails there is an oak parquetry floor. The pulpit and eagle lectern are new, and are carved in oak. The church is heated with a hot-water apparatus, by Bacon, of London. A vestry has been shut off at the east end of the new north aisle by the erection of a screen in pitch-pine, designed by the architect. The seats and chancel stalls are also of pitch pine. On the south side of chancel has been erected a stained-glass window, in remembrance of the late Adjutant Bradford. The subjects are David and Joshua. Mr. E. Knapp, of Lea, took the contract for masonry, and Mr. E. Stratton, of Garsdon, that for woodwork; the cost of the work has been £1,800.

London School Board.—At the meeting of this board held on the 8th inst. a discussion took place on the system adopted by the Board of inviting builders' tenders only from a selected list. Miss Taylor and Mr. Roberts strongly condemned this mode of transacting business, as most prejudicial to the public interests; and Mr. Ross moved, that in the particular case under discussion, the drainage of the playground of Upton House industrial school, that tenders be invited by public advertisement. Mr. Freeman, as chairman of the Works Committee, stated that there are over a hundred names of builders on the board's list, and that no builder is ever shut out from competing for the board's work if he is a man of position and stability. Eventually the amendment of Mr. Ross was rejected. — At the preceding meeting the board accepted the following tenders:—New school in Compton-street, Goswell-road, Wall Bros., £12,447; ditto, Oldfield-road, Stoke Newington, C. Wall, £8,150; repairs and painting at the School Board Offices, on the Victoria Embankment, C. Durant, £1,140 14s. 7d.; and improvements in a school in Walton-street, Chelsea, just acquired by transfer, B. E. Nightingale, £617. For supplying furniture and fittings to schools, the following sums were voted:—St. Clement's-road, Chelsea (new school), £606 8s. 9d., 802 school-places, equal to a cost of 15s. 1d. per head; Wenlock-road, New North-road (new school), £868 19s., 1,196 places, equal to 14s. 6d. per head; and Hargrave-park-road, Upper Holloway (enlargement), 500 places, equal to 12s. 1d. per head.

Northwood, Buxton.—A house is being erected here for Mr. John E. Harrison, of Buxton, on the site of an old one which has been taken down for the purpose. The cellars and foundations of main walls are retained, and in a great measure decided the plan of the new structure. The outbuildings and west wall of kitchen are the only parts of the old building remaining above ground. The new residence is built of rock-faced Buxton grit stone, with boasted beds and joints, jointed in Portland cement. The dressings round windows and doors, quoins and strings, are of wrought stone. The principal entrance is constructed of cube stone of large dimensions, obtained from a quarry near by. The internal fittings of the entrance hall are in English oak; those to the principal rooms and staircase being pitch-pine. Hot water is laid on in the offices and bath-room; the passages and linen-room are heated with circulating pipes. The windows in principal rooms are fitted with double-hung sashes, the bottom sashes being glazed with polished plate, and the upper ones with coloured designs in lead. Messrs. Richard Waite, Duffield, and John R. Parkin, Idridgehay, are the joint architects. The work is being carried out by Mr. Nelson Webbe, of Buxton, contractor.

Ryton-on-Tyne.—The foundation-stone of a new Wesleyan Methodist chapel at Ryton, was laid on June 24th. The style is Early Pointed, and the chapel will consist of a nave, separated from side-aisles and transepts by a series of pointed arches springing from cast-iron columns, which will carry a clerestory wall. At one end of the nave there will be a pulpit platform of pitch-pine, stained and varnished. The building will be built of stone, and the walls on the outside faced with thin courses of blocking. At the north-west angle of the chapel will be a lofty tower, covered with a slated roof. In the rear of the main building there will be rooms for the caretaker to dwell in, and underneath will be a chamber for hot-water apparatus. The peculiar character of the plot of ground necessitated an unusual height of foundations, and advantage has been taken of this to provide a large room under the whole area of the chapel. It is intended that the transepts shall not be seated for the present, but be divided from the chapel, and formed into a schoolroom and four vestries. The architect has provided in his plans for an extension of the building, and, when the requirements of the congregation demand it, the transepts will be opened out to the other portion of the chapel, and a lecture hall and school, with class-rooms, vestries, and other accommodation will be erected at the rear of the present works, in harmony with the original building. The chapel, as now arranged, will seat 280 persons, and with the extension referred to, 230 more sittings will be obtained, making 510; and the accommodation is arranged to be still further increased by the erection of a gallery in each transept, which will bring up the sitting accommodation to 620. These extensions may be made by easy and gradual stages to meet the growing requirements of the congregation. The contractors for the works are: Mr. Wm. Lishman, Ryton, mason-work; Mr. John J. Salter, Ryton, joiner's work; Mr. J. Rutter, Ryton, painting; Messrs. C. and G. Nicholson, Newcastle, slating; and Messrs. R. B. Charlton and Co., Newcastle, plumbing and iron-work. The building, as now contracted for, will cost about £2,950, and is being carried out from the designs and under the superintendence of Mr. Joseph C. Lish, architect, Newcastle-on-Tyne.

Tulse Hill.—A new Wesleyan chapel has been opened at Tulse Hill. It is in the Early Gothic style, and built of Kentish rag and Bath stone. The dimensions are 80ft. by 52ft. in the body of the chapel, with a wide semi-circular ended chancel 30ft. deep in addition, which, with the double entrance porches, give a total length of 126ft. In the basement is a large school-room 51ft. by 51ft., with a height of 15ft., and amply lighted. There are several other class-rooms and vestries. A tower and spire are in course of erection, the design being that of an octagon lantern on the tower with pinnacles at each angle and smaller ones at springing of spire above octagon. The architect is Mr. Charles Bell, of Dashwood House, 9, New Broad-street, E.C.; and the builders are Messrs. J. and C. Bowyer, of Norwood. The total cost would be, including fencing, upwards of £11,000.

Yeadon.—The Town Hall and Mechanics' Institute at Yeadon were formally opened on Saturday week. The building has been erected from the designs of Mr. W. Hill, architect, Leeds, at a cost of about £7,000. The front elevation is surmounted by a spire, with illuminated clock. The front porch gives access to a vestibule 10ft. by 18ft., and the vestibule admits to an entrance hall, 48ft. by 30ft. Behind it are two class-rooms, lavatory, curator's room, and a room which is to be used as the Board School. On the left of the front porch are the Local Board room and waiting room, and on the right the conversation room and the Mechanics' Institute. The rest of the space on the ground-floor is divided into a reading-room for the institute and four class-rooms. On the second floor is situated an assembly room, which will accommodate about 1,200 persons. Its area is 72ft. by 48ft., and it has an orchestra 22ft. by 32ft. at one end, and a gallery 48ft. by 13ft. at the other, and side galleries, each 72ft. in length. The height from floor to ceiling is 31ft. 6in. The ground-floor upon which the building stands is 140ft. in length and 80ft. in width. The building has, by the joint liberality of J. M. Barwick, of Low Hall, and A. Brayshaw, of Yeadon, Esqrs., but in the names of two of each of their respective children, been enriched by two large six-light stained-glass windows, designed and executed by the art firm of Powell Bros., Park-square, Leeds. The subjects illustrated are specifically appropriate to the staple industry of Yeadon, viz., sheep-shearing, and spinning and weaving. In the shearing, the description of Thomson, "The Poet of the Seasons," has been followed; the sheep lies "bound," and is being "of its robe bereft" by the "tender swain's well-guided shears." The companion window exhibits antique spinning and weaving in perhaps the simplest forms. The loom, verified in and copied from the British Museum antiquities, is one which appears to have been common with the early Syrians, Egyptians, &c., such as is probably yet to be found in the tents of the Arabs of the Sahara, and in the huts of the Impongwo, and other native tribes of West Africa, whose cloth is woven palm-fibre. Over this loom a Syrian man is bending at his work, and by his side sits a Syrian woman, supporting a distaff with one arm, whilst her hands are engaged in spinning with a spindle, according to the fashion in vogue before spinning-wheels were even a dream. Ten family and other appropriate heraldic blazons of arms enframe the subjects, including those of the county (York), and the Clothworkers' Company, and riband legends, traversing the open but enriched spaces, record the dedicatory gifts to "the people of Yeadon."

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A new Baptist chapel was opened at Newbridge-on-Wye on Tuesday week. It is built of local stone relieved with brick band-courses, and the dressings are of Forest of Dean stone; the fittings are of pitch-pine, varnished. At the rear is a large schoolroom, divided by a movable partition. The Rev. H. Thomas, of Swansea, was the architect, and the contractors were Messrs. Howells and Jones, of Ystradgynlais. The cost has been £1,160.

The parish-church of Week St. Mary, near Stratton, was reopened on Thursday week, by the Bishop of Truro, after restoration.

New premises are in course of erection for St. Mark's ophthalmic hospital, Dublin, from the plans and designs of Mr. Drew, of that city.

PARLIAMENTARY NOTES.

The Tay Bridge.—In the House of Commons last week there was a short discussion on the Tay-bridge accident. On the second reading being moved of the Bill of the North British Railway Company for the rebuilding of the bridge, Mr. Anderson opposed it, and, adverting to the condemnation passed on Sir T. Bouch in Mr. Rothery's report, strongly objected to that gentleman being employed in the reconstruction of the bridge. Mr. Chamberlain, in the course of his reply, said that Sir T. Bouch would have nothing to do with the plans, and explained that he proposed to refer the Bill to a hybrid committee, with instructions which would widen the scope of the ordinary inquiry. After some further conversation, the Bill was read a second time and ordered to be referred to a hybrid committee, with power to inquire into the best position for the bridge, the protection of the navigation, the best mode of securing its permanent safety, &c.

The Royal Academy.—Mr. Thompson asked the First Lord of the Treasury if the Government would use its influence with the President of the Royal Academy to open its exhibition free of charge on Monday, the 2nd of August, being Bank Holiday. Mr. Gladstone said it was not usual for the Government to interfere in any manner in the administration of the details of the Royal Academy. At the same time, he had every reason to believe in the disposition of the President and the Council of the Royal Academy to give accommodation to the public, and to entertain any reasonable proposal; and without giving an opinion—which would not be in accordance with his duty—on this proposal, he would recommend that the gentlemen interested in it should seek an opportunity of meeting, on public grounds, the President of the Council. He had no doubt any representations made would be kindly and respectfully and carefully entertained.

Borough Boundaries.—Mr. P. A. Taylor asked the President of the Local Government Board whether the Government contemplated the introduction of a measure to facilitate the extension of borough boundaries for municipal and sanitary purposes; and, if not, whether the Government was willing to recommend the appointment of a Royal Commission to inquire into the subject.—Mr. Dodson: The matter is one of considerable difficulty, in consequence of the political considerations incidentally mixed up with it, and the Government have not yet had time to consider how far it will be practicable to effect the extension of borough boundaries, otherwise than by local Acts. At the same time, it is very desirable, from a sanitary point of view, that further facilities should be given for this purpose, and attention shall be given to the subject during the recess. The information at present available will probably be found sufficient to enable the Government to arrive at a decision, and it does not, therefore, at present appear necessary to recommend the appointment of a Royal Commission to inquire into the matter.

Construction of Harbours in Ireland.—Mr. Forster, replying on Monday to Mr. O'Connor Power, said the Committee appointed to carry out the construction of additional piers and harbours in Ireland had fixed on some piers, and were selecting sites for others. He could not, however, make a statement in anticipation of their conclusions.

The Irish National Museum of Science and Art.—Mr. Bellingham asked the Vice President of the Committee of Council on Education if he could inform the House at what stage were the arrangements for the establishment of the National Museum of Science and Art in Ireland. Mr. Mundella said no definite arrangements had yet been made for the building of this Museum in Dublin, owing to difficulties which had arisen, the nature of which was explained in the last Report of the Science and Art Department. During the recess the Government would be in a position to prepare estimates for the new building. Mr. Bellingham, being dissatisfied with this reply, gave notice of his intention to apply for the production of a copy of the correspondence between the Royal Dublin Society and the Science and Art Department.

The Recent Gas Explosion.—Mr. Firth asked the President of the Board of Trade whether the Board had jurisdiction to institute an inquiry into the causes and circumstances of the recent gas explosion in the Tottenham-court-road; and, if so, whether it was their intention to institute such inquiry. Mr. Chamberlain: The Board of Trade have no authority under the Gas Act to institute an inquiry into the matter to which the question refers. It seems to me, however, to be a matter of so much importance that it is desirable to have a thorough investigation into the circumstances, and I have, therefore, communicated with Dr. Hardwicke, the coroner, on the subject, and he has desired Mr. Vernon Harcourt, one of the gas referees, to act as assessor during the inquiry. (Hear, hear).

The Tay Bridge.—Sir A. Gordon asked the President of the Board of Trade whether the position and the construction of the piers of the bridge across the River Tay, and the width and the height of the spans or openings between the piers, as they were altered from the deposited plans approved by Parliament, were such as were prescribed by the Board of Trade. Mr. Chamberlain said the position and construction of the piers of the Tay-bridge differed from the plans sanctioned by the Board of Trade, according to the provisions of the Act authorising the construction of the bridge. The company did not inform the Board of Trade of the alterations which had been made, and the Board were not aware of those alterations until some time after the piers had been fixed. As the width of spans was settled in the first instance by the Board of Trade purely out of regard to the convenience of navigation, and as the increased width was an improvement so far as navigation was concerned, the Board saw no reason to interfere with the alteration.

Railway Companies and their Bridges.—Sir G. Campbell asked the President of the Board of Trade if he would be so good as to state what course the Government proposed to adopt in consequence of the Report of the Wreck Commissioners regarding the fall of the Tay-bridge. Mr. Chamberlain said that as soon as the Board of Trade received the report of the Court of Inquiry with regard to the Tay-bridge, he directed a circular letter to be sent to all railway companies in the kingdom, enclosing a copy of the report, and calling their attention to the liabilities they incurred with regard to similar constructions on their lines of railway. He also wrote to General Hutchinson calling upon him to offer an explanation as to the remarks contained in this report as to the original inspection of the bridge. It was his intention to appoint a committee to consider what rules were desirable to be made with regard to the wind pressure on railway construction, as suggested by the Court of Inquiry.

Civil Service Estimates.—The House of Commons went into Committee of Supply on the Civil Service Estimates on Monday, and voted £37,771 for Royal Palaces. The next vote of £35,401 for the Houses of Parliament afforded an opportunity to Mr. Rylands of bringing under notice the insufficient accommodation in the House of Commons for the reporters. Mr. Adam promised that the recommendations of the Committee should receive careful consideration. Mr. A. M. Sullivan held that the accommodation not only for reporters but for strangers and members, was a reproach to the country. Sir A. Lusk saw no occasion for rebuilding the House in order to extend the accommodation for members, and Mr. H. Wiggan would regret to see the present House destroyed. Mr. M'Coan (H. R., Wicklow) considered the cage in which ladies were placed a disgrace to the House. Mr. Adam observed that the whole question was under the consideration of the Government. The vote was agreed to, as were also £116,432 for public buildings, £16,385 for furniture of public offices, £183,073 for Revenue Department buildings, £50,600 for County Court buildings, £27,145 for Metropolitan Police-courts, £8,200 for Sheriff Court Houses, Scotland, £110,200 for the new Courts of Justice, £16,000 for courts of law and offices, Edinburgh, £133,500 for the survey of the United Kingdom, £4,693 for British Museum buildings, £29,728 for the Natural History Museum, £20,000 for Edinburgh University Buildings, £19,825 for harbours under the Board of Trade, £195,356 for rates on Government property, £10,000 for Metropolitan Fire Brigade.

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The Metropolitan Board of Works having on Friday pronounced in favour of the model sphinx placed on one of the pedestals of the Cleopatra's Needle, and of the additions to the obelisk base, the permanent sphinxes and "buskins" are to be forthwith cast and placed in position as soon as completed.

The parish-church of Crawley, Sussex, was re-opened on the 1st inst., after enlargement, including the restoration of the chancel to its original length. One hundred and forty additional sittings have been provided.

The parish-church of Ashby-de-la-Zouch, re-opened after restoration at a cost of £10,000 on March 31st last, has just been enriched by the presentation of a memorial brass, 7ft. by 3ft., set in black marble, and placed in the chancel to the memory of Selina, Countess of Huntingdon, who is buried in the church; and also by two stained-glass windows, which have been placed in the north aisle. The windows are the work of Messrs. Lavers, Barrand, and Westlake, of London,—the one represents Our Lord bearing His Cross; the other, the Last Supper, the Agony in the Garden, and Our Lord Washing the Disciples' Feet.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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To American Subscribers.—Mr. W. L. Macauley, of 23, Dey-st., New York City, is authorised to receive subscriptions for the Building News. Annual rates, 6 dols. 40c., gold.

Cases for binding the half-yearly volumes, 2s. each.

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N.B.--Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—M. and Co.—H. P. and H.—Rev. J. B. M.—H. W. and Co.—H. S. A.—J. W. and Co.—F. W. and Son.—A. S. Co.—C. F. L.—M. and L.—J. P. jun.—C. and S.—McN. R. and Co.—F. Bros.—M. H. B. and Co.—F. I. Co.—J. A.—D. H. and Co.

Drawings Received.—J. F. D., M. J. L.; Entrance to an old Churchyard; B. H. T.; J. P. J.

Disgusted. (No wonder you are, but so are others in similar cases, and it is little use our publishing details of such cases if the offending party is not a member of the R.I.B.A., and not very much then.)—Nil Desperandum. (Can appear as an advertisement with name and address.)

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received. — Our Praises are our Wages, Attempt, Excel, Factable, Ernest, Mustapha, Ap Adam, Clansman, Pupil J., Hubert, Jack in circle, Haaberjeg, Edwin.

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Correspondence.

THE FUNDS OF THE R.I.B.A.

To the Editor of the Building News.

Sir,—I venture to send you the inclosed correspondence, as it may interest many of the members of the Institute besides myself.—I am, &c., W. Burges.

15, Buckingham-street, Strand.

[The following circular was issued on July 9, 1880].

Royal Institute of British Architects,
9, Conduit-street, Hanover-square, London, W.
9 July, 1880.

NOTICE is HEREBY GIVEN that, on Monday Evening, the 19th July, 1880, at 8.30 p.m. precisely:

A Special General Meeting of Members will be held, in accordance with By-laws LXIV. and LXXI., to authorise the sale of £2,300 Three Per Cent. Consols, for the purpose of discharging the remaining liabilities in respect to the recent Premises alterations, and of reimbursing to the Ordinary Funds a portion of the advances made therefrom.

Thomas H. Wyatt, Hon. Sec.
William H. White, Secretary.

15, Buckingham-street, Strand.
July 12, 1880.

My Dear Sir,—I see by the circular just received from you that a Special General Meeting is to be held on Monday "to authorise the sale of £2,300 Consols for the purpose of discharging the remaining liabilities in respect to the recent Premises alteration."

I see also by the annual report that we now possess invested in the funds £4,060 17s. 9d., valued at £3,939.

We shall then, roughly, diminish our stock by one half.

As I do not suppose that the expenditure in question has been incurred by the council upon its own authority, will you kindly oblige me by the information as to when, and by what sort of general or special meeting, the authorisation was given to incur liabilities which will have the effect of so very materially diminishing our funded property; and also whether advice of such a subject was given in the notice paper, in the first instance, before the said meeting?—I remain, yours obediently,

W. Burges.

W. H. White, Esq., Secretary to the R.I.B.A.

Royal Institute of British Architects.
13th July, 1880.

My Dear Sir,—In reply to your favour of yesterday's date, I have much pleasure in sending you Nos. 11 and 13 of the Proceedings of last Session, in which, at pp. 87 and 88 you will find the paragraph (Annual Report) referring to the then-suggested alterations; and at p. 112 you will find the Special Report therein mentioned. The resolutions, giving the authorisation about which you ask for information, are printed on p. 114.[*]

It will, however, give me greater pleasure to see you here, if you can spare the time, in order that I may show you some of our Minutes and Reports on this—strange as it may seem—difficult and prolonged business.—I am, dear Sir, truly yours,'

William H. White, Secretary.

William Burges, Esq., 15, Buckingham-street,
Strand, W.C.

15, Buckingham-street, Strand.
July 15, 1880.

Dear Sir,—I have to acknowledge your communication of yesterday, and I have carefully read the extracts in question. It appears that although the meeting (5th May, 1879) gave authority to the Council to rearrange certain parts of the building, and to obtain a new lease, not a word is said as to where the money is to come from. If the resolutions in question are to be considered as covering the diminution of our property by one-half, they would equally apply to its total absorption.

I hope you will excuse me if I say the affair appears to me as a very unbusinesslike transaction, both on the part of the council, and on that of the meeting.

Why not have asked for a grant before going to work? As many other members may be as desirous as myself to know the rights of the affair, and as the subject is essentially a public one, I am about to send our correspondence to the Building News.—I remain, yours faithfully,

W. Burges.

W. H. White, Esq.

LIGHT AND AIR.

Sir,—After the decision given lately by Mr. I'Anson in the case of Laybourne v. Kidstou, I am afraid that what works are now published on light and air are of little value—that is to say if Mr. I'Anson is looked upon as an authority, which I believe he is.

The case mentioned above was one in which some ancient lights were involved, and Mr. John Whichcord and myself surveyed the premises on behalf of the plaintiff, and Mr. Hovenden for the defendant.

The lights mentioned consisted of two skylights, and other windows overlooking the skylights and facing the south, with a wall on the east side, but quite open in the front and west side, without any obstruction than at a greater angle of 43 degrees. The defendant pulls down and rebuilds the premises, making a high wall on the west side of plaintiff's lights, and carries it up some 23ft. higher than the old buildings, so that the front diagonal light does not fall at a less angle than 60 degrees; and also builds another wall at the foot of the skylights 5ft. high, and close up in front of same, so the front light does not fall at a greater angle than that allowed by 73 degrees, and by that means leaves the skylights and other lights virtually in a square box or area 9ft. by 6ft., from which they must obtain all their light. In his report he says that the windows over the skylights (the sill of the lower one is only 18in. above the top of the skylights) have not had the light injured in any way, and that the skylights are only very slightly injured; by means of which report the plaintiff has to pay the costs and damages.

How Mr. I'Anson arrives at his decision I cannot say; but it seems to me to be out of all reason, either with the laws of light or common-sense; and if Mr. I'Anson's views are to be followed, it seems to me that ancient lights are of no value whatever, and the sooner there is no law to protect them the better.—I am, &c.,

Walter J. N. Tomlinson, Arch.

13, Great James-street, Bedford-row, W.C.,
July 14.

SHEFFIELD PARISH-CHURCH FONT COMPETITION.

Dear Sir,—Inclosed is just to hand. Kindly give publicity to both, and oblige.—Yours, &c.,

M. E. Hadfield and Son.

Corn Exchange Chambers, Sheffield,
14th July, 1880.

Corn Exchange Chambers,
Sheffield, 14th July, 1880.

SHEFFIELD PARISH-CHURCH.

Dear Sir,—With regard to your circular as to a proposed competition for a font design in the Sheffield Parish-church, we beg to say we do not embark in unlimited competitions, and even were we so foolish as to do so, should, in the present instance, hesitate to send a design for a comparatively small matter like a font, or, for that matter, any decorative necessary where a brother-architect was employed on an important work, such as the restoration of the Sheffield Parish-Church. We apprehend we may venture respectfully to offer an opinion or suggestion that, if the Sheffield Freemasons want a font design, they surely cannot go far wrong by applying to the architects in whose hands the important work of restoring our old Parish-church has been placed, and whose drawing (or rather a photo-lithograph) appears at the head of your circular, we presume.

Kindly lay this letter before your next meeting.

We are, yours faithfully,

M. E. Hadfield and Son.

P.S.—We have forwarded a copy of this letter, and your circulars to the professional journals.

PROPOSED FONT FOR THE PARISH-CHURCH OF SHEFFIELD.

The parish church is at present undergoing complete restoration, and the Freemasons of the town propose to give a new font.

The committee appointed to carry out the proposed gift invite competition for the design of the proposed Font, and the execution of the work on the following terms.

1. The entire sum to be spent will not exceed £150.
2. The committee do not suggest any particular materials, but throw out for the consideration of competitors the fact that the church is situate in the middle of a smoky manufacturing town.
3. The committee do not absolutely and at all events pledge themselves to accept any of the designs submitted for competition: but in the event of a design so submitted being accepted, the author of it will be entrusted with the execution of the work, and a prize of £5 will be given to the design which, in the opinion of the committee, is next best to that accepted.
4. In the event of none of the designs so submitted being accepted, the prize of £5 will be given to the author of what is, in the opinion of the committee, the best design submitted for competition.
5. Designs must be sent in not later than 1st September, to the Hon. Sec.

Ensor Drury,
24, George-street, Sheffield.

After the selection the designs will, of course, be returned to the authors.

UNDERWRITING DWELLING-HOUSES.

Sir,—I have carefully read the letter of a "Civil Engineer" in the last issue of your journal, in which Mr. Cresswell's proposal, discussed at the Society of Arts the other day, is reviewed; but I cannot gather what the opinion of the writer is except that it is desirable to start with a system of testing all building materials, in which every one will cordially join. A "Civil Engineer" is not very sanguine of results: he appears to think that to provide for the proper and sanitary construction of new buildings would be almost impossible, as it would involve an examination of the site of houses, an intelligent scrutiny of materials and every detail, tests to secure the use of good bricks and mortar. He says: "Lloyd's and its officers have, by long experience, arrived at the most advantageous methods by which they are guided in their by no means careless or indifferent surveys and examination; but it will be difficult, if not impossible, in the present lamentable condition of constructive science, to institute such tests as can secure the object Mr. Cresswell has in view." Quite true; and why may not the supervisor of dwellings be equally efficient and expert in detecting bad material or workmanship; why is it more possible to underwrite for vessels than dwelling-houses? I cannot admit that the difficulties in the way of house-building are so numerous or so great as to baffle properly-qualified inspectors. The only difficulty I can surmise is that of examining foundations and those materials of a building which are not readily accessible or are easily concealed; but if all materials were subjected to previous examination before being brought on the ground, and daily inspections were made of foundations, it is not possible to conceive how the most dishonest builder could possibly elude the inspector's eye. Of course, in such a scheme it should be made imperative that every foundation should be inspected before the footings or concrete were laid, and that the brick footings, damp-course, etc., should be certified to at the time of their construction. Drains and excavations ought also to be certified in the same manner. Under such conditions I am at a loss to see why the underwriting of dwellings should be less possible than that of vessels of the mercantile marine, or in what way the classification of sanitary reliability of houses would be more difficult.

Architectus.

THE OBELISK ON THE EMBANKMENT.

Sir,—On reading the short note about this, in last issue, I went up to see the models of suggested additions to the obelisk and granite plinth; and must confess to a strong feeling of disappointment on æsthetic, as well as on common-sense grounds.

The additions, which are very well modelled and got up by the artist employed, consist of a Sheath for the eroded end of the monolith, a Cornice, &c., on the block-pedestal, and the Sphinx, of which, I gather, there are to be two.

The feather-like features at the angles of the sheath certainly lessen the apparent height; which is a fatal objection, as the whole looks quite short enough amid its surroundings.

The cavetto round the top, and the roll-mouldings at angles of pedestal, are copied from the huge pylons at Philæ and elsewhere; and besides being ridiculous when so small, are wrong in the imitating of granite work in bronze. The tablet in the centre of each face, with the regulation row of serpents at top, and dado fringe at bottom, is affixed regardless of masonry-joints or constructive propriety. The whole looks too evidently *stuck-on*, and might, with greater fitness and economy, be made in compo.

The sphinxes will be turning their backs, in solemn disdain, on the obelisk, which is the only genuine thing, while they are the shams. Such adjuncts were usually placed with the front part of their bodies towards the central axis; and thus formed a part of the composition. If even the head were turned (so as to make them "couchant guardant") there would be more coherence in the design. At present there is a "lift-on-and-off" effect; and the vacant pedestal looks rather the better of the two. But why a sphinx? The obelisk was presented for British prowess; surely a British Lion (though not like those in Trafalgar-square) would have been more appropriate.

The cartouch for royal name (which gives the date) on breast of animal, instead of Victoria or anything else to denote the 19th century of the Christian era, has the signs for "Men-ho-phra"! Can anything be more like "playing at archæology," and more likely to cast discredit on the *real* work than this? The detail of the whole of the "fixings" is undoubtedly fairly correct Egyptian. Dr. Birch's approval is security for that; but why Egyptian detail at all? If we were mounting a ballet for the stage and wished to keep the *couleur locale* in these days of scenic realism, that might be right; but in architecture the nearer the counterfeit the greater the danger; and if the design be adhered to, in 50 years, people may imagine the whole group, obelisk, sphinxes and all, to have been brought over from Egypt, or else that the obelisk, as well as the additions, had been manufactured at Brummagem. Thus we falsify history, and to this has our slavish adherence to archæology reduced us! In the pedestal of the obelisk in the Place de la Concorde, there are some quaint designs in the Egyptian style graven by the French at the time of re-erection. These childish conceits are utterly unworthy of a dignified monument; but the French, at any rate, stopped short of the lower depth of sphinxes, &c.

I trust it may not be too late to postpone the present scheme until some alternative has been considered. Surely, Mr. Vulliamy, the accomplished architect to the M. B. W., cannot have approved of our obelisk being desecrated by these Wardour-street "properties."

I do not know if the S. P. A. B. has moved in the matter; no stability is in question, and the matter might rest. I believe I have seen nearly all the Egyptian obelisks which have been re-erected in Europe, and not one of them that I know of, either in Rome or elsewhere, is treated in the sham Egyptian style proposed for ours. Our national taste is at stake in this, for we shall never have another venerable relic, like the present, to experimentalise upon and so thoroughly vulgarise.

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[*] Resolved, that it is not at present expedient to appropriate the upper rooms of the building (9, Conduit Street, W.), but that it be referred back to the Council to rearrange the entrance, the staircase, and the first floor rooms in the best manner which can be devised, and to carry the same into effect.

Resolved, that the Council be not restricted to avoid any interference with the upper floors, but that, if an additional area can be there obtained of moderate extent, they have power to negotiate for the same with a view to improve the ventilation, and make the required arrangements relating thereto with the Architectural Union Company; and further, that the Council be empowered to surrender the present lease of the premises, and to make the necessary arrangements for executing a new lease with the Architectural Union Company.

Hugh Stannus.

Kennington Park-road, S.E., July 7.

SANITARY ASSURANCE AND CLASSIFICATION.

Sir,—I have to thank "A Civil Engineer" for his opportune suggestions with regard to the materials of construction and the site and soil of our future dwellings.

Without sound bricks and genuine cement, it would be impossible to build healthworthy houses, however perfect the original design, or faultless the details of sanitary equipment.

Watertight drains and honest plumbing, traps, gullies, and ventilating cowls, are not the be-all and end-all of sanitary construction; and the question of porous bricks and limeless mortar did not escape the attention of the competent men who attended the conference of the 11th May last, and approved the resolution which I had the honour to propose.

Nor do I ignore the moral obstacles to be surmounted on the threshold of the enterprise; the inertia of the mass, the active opposition of the few; the heaven-born critics on the one hand, and those who dislike to be disturbed on the other. Nevertheless, with the intelligent co-operation of such men as your correspondent, there is room for hope; and "Faint heart never yet won fair lady." In the mind's eye, we may foresee the ideal house (A 1. 100) of the next century, like Lord Spencer's mansion even of this day, perfect in all its parts as a model yacht or a Cunard liner, registered and certificated according to a code of municipal regulations, as well-known and accepted by the common-sense of mankind as the laws of Moses.

The progress of scientific observation and practical experience, from day to day, may suggest modifications and dictate improvement; but the cardinal principles of sanitary science will remain. The nucleus of such a code exists already in the Building and Metropolis Management Act of 1855, the model by-laws of the Local Government Board of 1877, and the reports of scientific bodies, such as the Society of Arts or the British Medical Association.

All that is wanting is the breath of life, the force of public opinion, to infuse vitality into the dry bones of scientific conclusions, and "give to the age and body of the time its form and pressure."

Above all, we must have the sanction of Parliament—as the supreme guardian of the health of the people—together with local parliaments in every county, to inspire confidence, and lend the sanction of authority to the certificates of their inspectors.

The Metropolitan Board within the metropolis, and the municipal authorities of our larger towns, may at once set a practical example and break ground for the good of the rest of the community; and so soon as a trial of the system has been attempted, there will be opportunity for the amplest criticism and really useful discussion.

There are readers of your journal, men of repute and calibre, whose judgment, in this respect, will be of practical value.

Meanwhile, if the principle be sound, it will live through the fiery ordeal; if not, let it die the death of many another good intention, and be forgotten.—I am, &c.,

C. N. Cresswell.

1, Hare-court, Temple, July 8th.

IRON-FILINGS IN CEMENT.

Sir,—In answer to "Electro-Magnet," I think he will need no further introduction to makers if he will try a magnet on, say, the first six examples of cement he meets with.

In further answer to Mr. Reid, that gentleman seems to have abandoned his first theory as to loose bolts and nuts and portions of the machinery being ground up with the cement, and now appears to think that though cement-makers cannot afford to mix iron with cement, gas companies are in a position to supply pieces of it, gratis, with coke; but he has to own that, at a certain stage, "the miller must become aware of their presence." If so, why does he not take steps to remove them, instead of "assisting their passage"; and why, if the miller is aware of the presence of iron, does everyone deny it is there? Mr. Reid, in his first letter, said that "iron, in even the mildest and least-objectionable form, is more or less dangerous." He now says that "iron, of the character in question, should not seriously prejudice the test." I cannot reconcile the two statements.

No sifting will detect the presence of iron; all cement contains more or less core. The eye cannot detect the particles of iron in this; only the magnet enables one to do so.

As Mr. Reid asks for further particulars, I send you three samples of cement, which are taken from casks of three different makers, opened at random. Samples A are the raw cement. Samples B are the core obtained by sifting two quarts of cement through a 50-mesh sieve. They all contain iron, which, if Mr. Reid will search for with a magnet, he will doubtless find. I have frequently met with cement containing much more iron than the samples I send; but thought it fairer to forward the samples just as they came, without searching for a bad case.

In conclusion, I impute no motive to makers; but I cannot accept Mr. Reid's theories as at all an answer to my first question, "How does iron, in its free form, come to be mixed with cement?" I have consulted makers, but neither they nor Mr. Reid seem prepared with a clear or definite explanation.—I am, &c.,

July 13. Magnet.

TAY BRIDGE DISASTER.

Sir,—In concluding his report on this disaster, Mr. Rothery says:—"Lastly, my colleagues in this report call attention to the fact that there is no requirement issued by the Board of Trade respecting wind-pressure, and that there does not appear to be any understood rule in the engineering profession regarding wind pressure in railway structures, and they therefore recommended that the Board of Trade should take such steps as may be necessary for the establishment of rules for that purpose. I cannot, however, join in that recommendation, for it appears to me if there is no understood rule in the engineering profession regarding wind-pressure in railway structures, it is for the engineering profession, and not for the Board of Trade to make them."

This question, then, of wind-pressure, appears to be the principal rock upon which the commissioners split, and it is for the public to put them right. I, for one, differ with Mr. Rothery. If engineers, and not the Board of Trade, are to make the rules for wind-pressure, they, like doctors, might differ. It appears to me equivalent to saying architects and engineers should make their own rules as to the thickness of walls, instead of the Building Act saying so. They might differ. If, as pointed out by Mr. Rothery, "it is the practice in France to allow 55-lb. per square foot for wind-pressure, and in the United States 50lb.," there seems no reason why the Board of Trade should not enforce a similar allowance in this country.

Yours faithfully,

July 13th, 1880. W. F. Potter.

P.S.—Since writing the above, I am pleased to see from the Parliamentary reports of this day, that Mr. Chamberlain announced in the House of Commons last evening "his intention to appoint a committee to see what rule should be made with regard to wind-pressure, as suggested in the inquiry."

A GAS-EXPLOSION IN CHEAPSIDE.

Sir,—If in Cheapside, or any other City thoroughfare paved with something like a foot of solid concrete beneath asphalte, instead of among comparatively loose material, as in the Tottenham Court-road, what would be the effect of a gas-explosion? The danger is apparently not such a remote one that we can afford to ignore it, and I should be glad to know what other readers think would be the result so far as the cellars and basements of the adjoining houses are concerned.—I am, &c.,

F.

"ESSAY ON THE HISTORY OF ENGLISH CHURCH ARCHITECTURE."

Sir,—As I have learned that Mr. Edward Pococke has been soliciting, from architects and others, subscriptions to the above-named work, will you kindly allow me to state that he has no authority to do so, and that subscriptions can only be paid to Mr. David Bain, at the publishers, 31, Southampton-street, Strand.—I am, &c.,

July 16. G. Gilbert Scott.

CHIPS.

At a meeting of the Salisbury Church Building Society, held on Tuesday week, the payment was ordered of £125 towards the restoration of Shapwick parish-church, Dorset, and of smaller sums for the iron church of St. Martin, Salisbury, and Popham district church, Bremhill, Wilts.

The town council of Hereford decided, on Tuesday week, to adopt several measures for improving the water-supply of the city, as suggested by Mr. G. Cole, city surveyor, including the erection of a tank, 100ft. high, on an elevated site, to be supplied with water from the works by means of Mr. Isaac Shone's patent pneumatic ejector, as made by Messrs. Thwaites, Brothers, of Bradford. The new scheme will afford a high-pressure supply for the more elevated parts of the city, and is estimated by Mr. Coles to cost, including tower, ejector, and mains, £4,985.

The Youghal rural sanitary authority decided, on Friday, to call in Mr. Lynch, C.E., to report and advise as to a new water supply for the district of Killagh.

At the monthly meeting of the local board for Oxford, held last week, it was stated that counsel's opinion had been taken on the proposal to give an honorarium of £1,000 to Mr. White, the engineer, to mark the board's approval of the way in which he had carried out the drainage work, and, in reply to leading remarks, it transpired that the weight of opinion was against the proposal as illegal. The matter is to be again discussed next month.

A scheme for the supply of water to Wiggington and the outlying parts of Tring, prepared by Mr. Baines, C.E., was finally approved by the Great Berkhampstead rural sanitary authority last week.

The local board of Alford, Lincolnshire, decided on Saturday to purchase a site in Farlesthorpe road, containing 2¼ acres, for a burial-ground, and to borrow £2,000 to inclose the land and build chapels and walls.

An inquiry was held at Peterborough on Tuesday week before Major Hector Tulloch, R.E., an Inspector of the Local Government Board, respecting an application on behalf of the Corporation to borrow a further sum of £8,160, on account of drainage and waterworks. The Inspector, at the close of the inquiry, intimated that the opposition which had been raised to the form was irrelevant.

At a meeting of the committee for rebuilding the Providence Congregational Chapel at Elland, near Halifax, held on Wednesday week, plans submitted by the architects, Messrs. Kirk and Sons, of Huddersfield and Dewsbury, were adopted; the chapel will be Gothic in style, with transepts and gallery, and is to seat 750 persons. A school assembly-room and class-rooms being also provided.

Extensive works of water supply are being carried out at Littlehampton, Sussex, for the local board. The pipes supplied by a Glasgow firm are being laid, and the foundations are about to be put in for the water tower. This will be 80ft. in elevation, and will have a high-level tank of over 100,000 gallons, and also a low-level tank of less capacity. Messrs. Grantham are the engineers; Mr. Hayter is the contractor, and Mr. Burns the clerk of works. The local board last week accepted the tender of Messrs. Laidlaw, of Glasgow, for the supply of water-works engines. The district is about to be drained, and for the work Mr. J. Bateman, C.E., is the engineer.

The Leamington town council appointed Mr. David Carey, late in the employ of Messrs. Powis and Co., of London, one of the contractors for the Artesian well pumps and machinery, as managing engineer at the new waterhouse. The salary is £2 10s. per week, with house, &c. There were 82 applicants for the appointment.

At the last meeting of the Fulham board of guardians a warm personal discussion arose on the draft instructions for the competition for the proposed new infirmary, and on the proposition to select six architects to compete for the work. Eventually notice was given by Mr. Schofield of a motion to rescind the resolution by which six architects only are to be invited to compete, and the question was adjourned.

A new school-chapel will shortly be commenced at Crosshill, Glasgow. The architects are Messrs. Pugin and Pugin.

Intercommunication.

QUESTIONS.

[6166.]—**Deal.**—Does a green stain in deal invariably denote sap? What is the matter with a deal when thickly covered with dark spots? What is a sure test to tell red deal from white for one to use whose eyes are not very apt at telling the difference of colour? If one or other of your numerous correspondents would kindly answer these questions for me, or direct me where to find the information I require, it would greatly oblige.—Student.

[6167.]—**Pitch for Tile Roof.**—Will some one kindly inform me what is the "usual" pitch for a tiled roof, to be safe with tiles laid to a 4in. gauge? Also define the gauge?—Arbitre.

[6168.]—**Half-Timbered Houses.**—In cases where weight need not be studied is it good to use brick nogging? With quartering 4in. in depth and the bricks on edge, I should have an inch left for plastering externally between the quartering. Would it be necessary to build the brick nogging in cement?—C. F. M.

[6169.]—**Bedroom Chimney-Piece.**—The woodwork of my bedroom is at present varnished, and I intend painting it white. How should the timber chimney-piece be done? Should the panels of the doors be different from the style?—Telephone.

REPLIES.

[6146.]—**Underground Cisterns.**—Having had considerable practical experience in the construction of underground cisterns, I beg to offer a few remarks and suggestions. There is no form of cistern so economical and convenient as a cylindrical one, with egg bottom and domed top, this form bearing external pressure much better than one square on plan, and requires no centering. Single brick is quite strong enough for cisterns up to 7ft. or 8ft. in diameter. Where there is no water to keep back, I have successfully constructed cisterns without puddle, depending on coat of cement inside (but do not allow water to run into cistern until the cement has had time to harden; allow, say, 24 or 36 hours). Where you have to contend with backwater, your work must be made thoroughly watertight before applying cement inside. Several times I have successfully used riddled soil in place of clay as puddle. Whether puddle is used as backing or no, it is a good plan to get your ground out, so that you have a space of two or three inches at back, which space should be thoroughly rammed as work proceeds. I have never seen a filter in connection with cistern, but have often thought one might be made to answer well, constructed in the form of a square box, with tight-fitting tray or trap made of some material that would act as a strainer on the water as it passed into the cistern. The trap would require less attention if the water was made to flow upwards through the strainers; on this plan the filter would always be full of water, which might be an objection. Of course size of filter would have to be suited to area of roof.—Bricklayer.

[6147.]—**Science and Art Certificates.**—Unfortunately, I have not received my number of the Building News in which is "Fortus's" question, but if I understand rightly, an explanation of the Science and Art examinations will be of service. 1st. Art.—Elementary architecture, open to students of schools of art and art night-classes, taught by art-masters, requires a knowledge of Greek and Roman architecture and their mouldings, and the larger distinctive characteristics of Gothic architecture, from the Conquest to the Perpendicular period. This is the examination required from all male students from the 1st art-master's certificate. The best books I know are Nicholson "Five Orders" and Bloxam's "Gothic." No candidate can be examined in this subject who has not passed an examination in freehand, geometrical, perspective, and model drawing, or who has not gained a 3rd-grade prize in the advanced section in the examinations of the works of schools of art and art classes in London. The advanced examination in architecture in London, open only to art-masters who have obtained the art-master's certificate of the first group, the text-books for which are Fergusson's History and Fairholt's "Dictionary of Terms in Art." Science.—The examinations for the science of building construction require a knowledge of all kinds of construction, and are divided into three stages, from elementary to honours; the honours requiring, in addition to a good general knowledge of materials, an examination in practical designing.—Art Master, and 1st Class Honours in Science.

[6147.]—**Science and Art Examinations, South Kensington.**—I venture to make a few notes on the singular replies published in this journal as to works of reference for the advanced architectural examination held under the Science and Art Department. "One not Certificated," and "Fortus" too, may well be perplexed with the contradictory replies the query in question has drawn out. Some of them, of course, cannot be correct answers to the question. "Holder of 1st Class Certificate" (in his reply of June 18th) asserts that "building construction [which] is the *only* examination relating to architecture held by the Department." This reply is quite beside the remark, as it relates to subject III. in the Science list, but the books mentioned are well recommended for that subject. "J. W. C.," also June 18th, recommends some good books for preparing for the architectural examination. Then, June 25th, some one "Certificated in All Three" (what three?), who also mentions some good books for the examination in question, condemns the first two replies, although why, in the case of "J. W. C.'s" reply, I cannot understand, and further states that "J. W. C.'s" reply answers for "Elementary Architecture." Now, as far as I am aware, there is but one grade recognised by the Department which is called advanced, or 3rd grade, architecture, and is on the Art list. This being the case, perhaps those who have replied before can explain how their information varies so much.—R. A. F. T.

[6154.]—**Hydropathic Establishment.**—Some years ago I received the commission to design a hydropathic establishment (since erected), and at that time used my best endeavours to obtain illustrations of similar buildings, but without success, the only way to get at requirements being to visit four or five modern establishments.—F. R. I. B. A.

[6162.]—**Hundred-Pound Cottages.**—In reply to "S. W." respecting hundred-pound cottages, I do not know the design referred to, but I am acquainted with a very neat and compact design by Mr. Ross, of Darlington, which cottages took the first prize, and were erected by the Royal Agricultural Society (England) some years ago. See their show ground at Leeds. They are grouped in pairs, and can be erected complete for £220 per pair. Lithographs, I believe, can be had.—H. W. C.

[6163.]—**Testing Portland Cement.**—To those unable to command the use of a testing-machine, it is advisable to make up a "pat" of neat cement, and after it has lost its plasticity it should be immersed in water. If it remains perfect in that position during 24 hours it may be regarded as safe, and may be used. A tolerable estimate of the strength of the cement may be obtained by cementing bricks together or making up small cubes which may be either tested by compression or transverse strain.—W.

[6164.]—**Damp Walls.**—I have several times taken out a course of common bricks just above ground-level in old damp houses, and inserted a course of Taylor's or Doulton's damp-proof perforated bricks. They can be obtained the thickness of a common brick (and any width according to the thickness of the walls) so that no making good with slates or tiles is necessary. Three feet more or less, according to the stability of the brickwork, can be done at a time, and the perforations serve to admit air for ventilation beneath the wood floors. No doubt exists as to the benefit derived from doing this to old houses where no damp-proof course has been inserted. The work should be done with Portland cement and sharp clean sand.—Thos. Potter.

[6164.]—**Damp Walls.**—Allow me to suggest to "G. B." that as it is nearly as troublesome to rake out the mortar joint and insert lead as to cut out a course or two of bricks, I think the best plan would be to introduce Taylor's patent glazed anti-damp course, of course keying up well with slate and cement. If the ground-level outside is not very high, I would recommend in addition excavating at the back of the wall, and either forming a blind area or asphalting, but, of course, this would only be possible in case of access behind the wall.—G. H. G.

WATER SUPPLY AND SANITARY MATTERS.

Aston.—There is some prospect of the drainage of this district being at last begun. Mr. G. B. Nichols, C.E., who laid the King's Norton sewers and had got out the plans for the Aston Authority, has been replaced by Mr. E. Pritchard, C.E., Past President of the Association of Sanitary Engineers, who recently laid the Yardley scheme, and other works in this locality; and the scheme, which was originally intended to cost something like £100,000, is likely to be very considerably reduced.

Dalton-in-Furness.—On Friday last a public inquiry as to the disposal of the town sewage was held at Dalton before Major Tulloch, R.E. It is proposed to convey the sewage for the existing filtration tanks to the sea. The inspector approved the scheme, and intimated that he should recommend a loan of £6,000, for carrying out the works. Messrs. Brierley and Holt, of Blackburn, are the engineers.

Halstead.—The works for the disposal of the sewage of Halstead, Essex, which have been in construction since last autumn, under the personal superintendence of Messrs. Bailey Denton, Son, and North, whose scheme was adopted by the Local Board of Health, are now rapidly approaching completion. The main sewer, extending from the former outlet at Parson's Bridge to Langley Mill, a distance of a mile and a quarter, has been for some time out of the hands of the contractor, Mr. Runnacles; and the windmill, erected by Mr. C. H. Hett, of Brigg, by means of which the sewage will be pumped to the higher levels on the farm, has been completed this week. This mill is forty feet high, and is provided with a circular self-acting sail thirty feet in diameter, driving a Noria chain pump, to which are attached 46 close buckets with open sides, each raising a gallon, equal to 46 gallons of sewage each revolution. The well is 20ft. deep, and six feet in diameter; and the brickwork is throughout excellent in character. It has been ascertained that the pumps, with an ordinary wind will raise 648,000 gallons in twenty-four hours. On Thursday week, when a comparative calm prevailed, the pump was found to be more than sufficient to deal with the sewage. The experiment of utilising the wind for this purpose seems likely to be successful, and it is believed that no difficulty whatever will arise in dealing with the estimated quantity of sewage—60,000 gallons in dry weather, and a maximum quantity of 250,000 gallons in the wet season—by the use of this economical motive power in raising it to some eight acres, the sewage being discharged over the remainder of the farm by gravitation. The whole of the farm of fifteen acres is now drained, and except a small portion, which will probably be completed in the course of three weeks or a month, it is levelled and trenched throughout, and roads intersecting the levels are made. Some three acres have been sown with rye grass, and another portion with prickly comfrey, but the operations were not sufficiently advanced to crop the entire farm this summer. The works were recently opened by Mr. Denton, jun., and two or three members of the Local Board, Mr. Mathews, Surveyor, and Mr. Johnson, the efficient clerk to the works, being also present. Early in the afternoon the sewage, which has hitherto flowed into the river Colne near Parson's Bridge, was diverted into its new and more legitimate channel. Owing to the slight fall—about five inches to the mile—nearly two hours elapsed before it reached the farm, whence it was allowed to flow upon one or two of the lower levels. About £7,000 have been expended upon the works.

Metropolitan Water Companies.—By the published statement of accounts of the eight London Water Companies for the year 1879, audited by Mr. Stoneham, on behalf of the Local Government Board, it appears that the share, loan, and debenture capital of all the companies amounts to £12,256,430. The rates, rents, and interest receivable by them, amount to £2,152,102, and the total expenditure for all purposes to £1,422,795, which admits of a dividend on the ordinary share capital, varying from 10 per cent. in the case of the West Middlesex, the highest, down to 4½ per cent., the lowest, to the shareholders of the Southwark and Vauxhall Company.

LEGAL INTELLIGENCE.

An Architect's Charges.—Before Vice-Chancellor Sir Richard Malins, in re the Alcazar Company. A petition was presented for the winding-up of this company by Mr. Edward Louis Paraire, an architect, as a creditor of the company for a large sum of money alleged to be due to him for preparing plans and for consulting with the company as to the buildings intended to be erected. The company was incorporated in September, 1878, for the purpose chiefly of erecting upon the freehold ground on which Saville-house, Leicester-square, formerly stood, a spacious theatre of varieties, containing a *café* and restaurant, where it was intended to have dramatic and musical performances, with popular interludes and attractive histrionic varieties. The names of the first directors were Lord William Lennox, Sir John Sebright, Mr. Wood, Messrs. Cramer and Co., Major Wingfield, Mr. Alexander Henderson, Captain Wombwell, and Mr. W. R. Lennox. The petitioner stated that he had prepared plans and elevations of the proposed building and had assisted the directors with his advice and experience as to the manner in which the building operations should be carried out, and that he had obtained tenders from builders and contractors for the construction of the theatre and restaurant, according to the plans prepared by him. During the whole of the period from the incorporation of the company down to December, 1879, he had been summoned to the meetings and consulted by the directors of the company as their architect with reference to carrying out the undertaking, and they availed themselves of the plans and measurements which he had prepared. Since December, however, the board of directors had declined to accept any of the tenders for the construction of the building which he had obtained, and had entered into negotiations with another architect, and they had declined to carry out the building for which the plans were prepared. The petitioner had consequently sent in his claim for the debt due to him, amounting in the whole to £2,960, and he alleged that the company were unable to pay the amount due to him and to other creditors, and that the company ought, therefore, be wound up under the direction of the Court. The petition was opposed by the company, who alleged that the charges made by Mr. Paraire were excessive, and they disputed the debt, but they had offered him £500 in settlement of his claim. They denied entirely that they were unable to pay the amount, and stated that the subscribed capital of the company was £23,350, and it was calculated that when the building was erected a large profit would accrue to the shareholders. The building to be placed on the site was now being erected, and considerable progress has been made with the work, and it was expected that the building would be opened in October next. Under these circumstances they opposed any attempt to wind up the company by a person whose alleged debt was disputed, and who could bring his action to establish any debt which might be justly due to him. The Vice-Chancellor said it was evident that there must be a considerable sum of money to which Mr. Paraire was justly entitled. Even the prospectus contained a representation of the building intended to be constructed, which, he was told, had been prepared from the plans furnished by Mr. Paraire. However, it was impossible for the Court to make a winding-up order upon the petition of a creditor whose debt was wholly disputed. He should, therefore, direct the petition to stand over until the petitioner's claim should have been established in an action.

Action for Damages for Dilapidations.—Mr. Henry Coutley, Prospect House, Stanningley, sued Mr. Alexander H. Yewdell, Prospect Villa, Stanningley, in the Leeds County-court, last Friday week, before Mr. West, for the sum of £14 8s. 6d. for dilapidations. The plaintiff is the owner of Willow Cottage, Stanningley, and about five years ago he spent £200 in repairing it. Since then the defendant had occupied the house at a rent of £100 a year. In February last he left, and then it was found that the house had suffered dilapidation to the extent of the amount claimed. The plants and fencing were damaged to a great extent. The defendant was called, and stated that the fixtures of the house had not been damaged, and that it was in as good a condition now as it was when he went into it. For the removal of the plants, he paid £2 2s. into court, and he further stated that the damage to the railings was caused by the plaintiff's dogs, cows, and hens.—A verdict was given for the plaintiff for £7 8s. 6d. beyond the amount paid into court.

Breach of Contract.—At Halifax County-court on Tuesday week, Hirst and Wilson, carpenters and joiners, of Elland, sued Joseph Newsom, coal merchant, Elland, for £26 15s., in respect of breach of contract. Plaintiff's case was that in July, 1878, defendant wished to erect four houses at Elland, and instructed Mr. Wilkinson, architect, of Sowerby-bridge, to prepare plans and advertise for tenders, which was done. On August 13th, plaintiffs tendered for the carpenters and joiners' work for £212, and on the following day Mr. Wilkinson wrote stating that their tender had been accepted, and they signed the contract for the execution of the work. After plaintiffs had ordered in timber to the extent of £80, and had, indeed, cut out 18 of the windows, defendant entered into litigation with a Mr. Casson as to the land, a lawsuit which resulted disastrously to him. At a later date, defendant informed plaintiffs that he could not build the four houses, and that he had transferred the architect's work from Messrs. Wilkinson to Messrs. Leening and Leening, of Halifax. He told plaintiffs that he proposed erecting one house, on plans prepared by another architect, and they tendered afresh for the work, but did not get it. The claim now made was composed of loss on reduction in price of wood, labour thrown out in cutting the window frames, loss of profit on contract, amount paid Mr. Wilkinson for quantities, and travelling expenses. The judge gave a verdict for £23 15s., disallowing the two guineas claimed for travelling expenses.—A second action against the defendant, Newsom, for £15 14s., was brought by Mr. Wilkinson, the architect, being 2 per cent. commission on the four houses, and £2 for travelling expenses; and after striking out the latter item, his honour gave judgment for £13 14s. for plaintiff.

STATUES, MEMORIALS, &c.

Statuary on Blackfriars Bridge.—Mr. Hart, at the last meeting of the City Common Council, moved; "That it is desirable that Blackfriars-bridge be completed in accordance with the designs and provisions of the engineer, by the addition of appropriate groups of statuary, to be placed upon pedestals provided for that purpose at the extremities of the bridge, and that it be referred to the Bridge House Estates Committee to obtain (by public competition) designs, which shall be the absolute property of the Corporation, at an expense by way of premiums of a sum not exceeding £1,000, reporting thereon, with the cost of executing the work, to this Court." Mr. Edmeston seconded the motion, remarking at the same time that he thought the recent strictures of Sir F. Leighton were scarcely deserved. The motion was agreed to.

Memorial Statue to Robert Raikes.—The statue on the Thames Embankment, unveiled on Saturday, July 3, was designed by Mr. W. Brock, of Osnaburgh-street, and has been cast under the direction of Mr. James Moore, at the foundry of Messrs. Drew and Co., of Thames Ditton. The figure is of bronze, and 9ft. 6in. in height. The Classic pedestal is of Cornish grey granite, and has been executed by Messrs. Freeman and Sons, of Penrhyn. The height of statue and pedestal together is 20ft. 6in., so that to the spectator the figure appears the size of life.

STAINED GLASS.

Gloucestershire.—Messrs. Camm Bros., of Smethwick, have lately fixed two windows, one at St. John's Church, Gloucester, and the other at Pensford Church. The former is Italian in style, centre-light subject, "Christ Blessing Little Children"—Our Saviour sitting in the midst of a group, having taken a child upon his lap, is in the act of blessing a girl kneeling before Him. In the background are several of the Apostles. The east window in Pensford Church has been filled with the subject of the Transfiguration. The window was supplied through Messrs. S. Cashmore and Co., of Bristol.

Halifax.—The five-light window at the east end of Archbishop Rokeby's chapel in the parish-church was last week filled with stained glass, as a memorial to the late Mr. John Waterhouse. The three centre lights are occupied by the Transfiguration, Our Lord being pourtrayed with Moses on His right, and on His left the prophet Elijah, while at the foot are the kneeling figures of the three disciples. In the sinister light are two subjects, the lower one being the Annunciation, and over it the Nativity of our Lord. The dexter light is also charged with two subjects—our Lord at the tomb of Lazarus, and the Raising of Lazarus, the twelve small lights in the head of the window having been filled with figures of the Apostles, each carrying in his hand the instrument of his martyrdom—save St. John, who is holding a book. The window is from the studio of Messrs. Clayton and Bell, of London. There are now 28 stained-glass windows in Halifax parish-church, including six in the clerestory, and another to Archdeacon Musgrave is about to be placed at the west end of the south aisle.

CHIPS.

On Tuesday week the Bishop of Rochester consecrated the new church of St. Crispin, which has been built on the site of an iron building in Southwark-park-road, Bermondsey. The edifice is in the Gothic style, of red brick with stone facings, and the cost of church and parsonage has been £15,870, including £2,800 for site. The tower and spire remain to be completed at a cost of about £900. Messrs. Coe and Robinson were the architects, and the builder was Mr. Shepherd, of Bermondsey New-road.

On Thursday evening two carpenters, named Coleman and Falconer, in the employ of Mr. Bromley, a local builder, were employed in fixing a facia board on the new Memorial-hall in Priory-street, Dover, when the scaffold shifted and both fell to the ground, a distance of 40ft. Coleman dislocated his neck, fractured his skull, and died immediately; Falconer was taken to the Dover hospital suffering from severe injuries. At the inquest held on Coleman on Friday, the foreman and a labourer gave evidence that the scaffold was erected in the usual manner, but as the cords with which the staging was lashed together could not be produced, the jury asked to have the inquiry adjoured till the injured man should have recovered, that he might be examined as to the construction of the scaffold. The inquest was accordingly adjourned for three weeks.

The old parish-church of Swansea was reopened on Thursday, the 8th inst., by the Bishop of St. David's, after restoration. The old high-backed pews have been replaced by open seats of pitch-pine, the galleries have been reduced in size and set back from the main pillars, the walls have been repainted, and the church is lighted by gas coronæ, in place of candelabra. The number of sittings remains as before the alterations. Mr. Bucknall, of Wind-street, Swansea, is the architect, and Mr. David Morgan, of the same town, the builder; the cost has been £660.

New steading has just been erected on the farm at Linkwood, near Elgin, belonging to Earl Seafield, for the use of the tenant, Mr. Eric Sunderland. The buildings are Gothic in character, and have been erected in freestone, with slated roofs, except the court, 132ft by 66ft., which is covered with corrugated iron. The floors to stables and cow-byres, poultry-houses, and piggeries, are of cement concrete, scored in squares to prevent slipping. The steading accommodates 104 head of cattle, with arrangements for extensions, should they be necessary. Messrs. Matthews and Mackenzies, of Elgin, were the architects; and the contractors were:—Masons, Messrs. Dow and Ray, of Rothes; carpenter, Mr. Jas. Mitchell, Keith; slater, Mr. Alex. Stewart, Aberlow; plasterers, Messrs. Maciver and Yourice, Elgin; plumber, Mr. J. Gordon, Elgin; concrete work, Mr. G. Ogilvie, Elgin; and ironwork, Messrs. Abernethy and Co., Ferryhill, Aberdeen.

A new Congregational church at Uddingston, near Glasgow, which has just been erected, was opened on the 200th anniversary of the battle of Bothwell Bridge, which took place in the immediate vicinity. The building is Early English in style, and has a tower and spire attached. All the windows are filled with cathedral glass, except the traceried wheel window over the pulpit, which is occupied by stained glass representing the Lamb of God, surmounted by the symbol of the Trinity, and with floriated Mediæval designs in the semicircles surrounding the centre light. An organ, procured in England, has been enlarged and remodelled for the church by Messrs. Spring and Brook, of Glasgow.

The local board of Chesterton, next Cambridge, have appointed Mr. Bland as surveyor, at a salary of £50 a year.

Our Office Table.

A deputation from the Sunday Society waited upon the trustees of the British Museum last week, to present a memorial praying for the opening of the museum on Sunday.—Lord Dunraven, who introduced the deputation, said he was president for this year of the Sunday Society, and he and those associated with him hoped the trustees would be able to open the Museum to the public on Sundays. The movement had worked well in the country, and the opposition to it had died out. He was of opinion that from a moral, social, and religious point of view it was better for the people to have some place to go to on Sunday than to spend their time in idleness. Mr. Mark H. Judge then read a memorial.—Sir A. Hobhouse said he was sure that if the Museum was opened it would be greatly frequented on Sundays.—Professor Godwin and Flowers also addressed the trustees.—Lord Sydney, in reply, said that, without expressing the private opinion of the trustees, he might say that it was out of their power to grant the prayer of the memorial without referring the matter to the Treasury.—Lord Dunraven thanked the trustees for receiving the deputation, and hoped that legislation would shortly deal with the matter.

"How to build Liverpool Cathedral" is discussed very forcibly by Mr. John Henry Parker, C.B., of the Ashmolean Museum, Oxford. He begs the Liverpool people not to be in too great a hurry. They must first get a plan, and build the two lower tiers of masonry to insure the ideas of the architect against change; "then go on with the choir only, finishing it quickly, establishing service, and having a collection before each Communion for the completion of the building." Then proceed with the rest of the building as money comes in—first the west front, and then the nave. This, as Mr. Parker says, was the old Christian custom.

The announcement that the President of the Royal Academy is henceforth to be ex-officio one of the trustees of the National Portrait Gallery, is a direct reversal by Mr. Gladstone of the policy laid down by Lord Beaconsfield. On the death of Sir Francis Grant and the election of Mr. (now Sir Frederick) Leighton to the presidency of the Royal Academy, most people thought that he would succeed to the trusteeship of the Portrait Gallery as a matter of course. In this they were promptly undeceived by Lord Beaconsfield, who, anxious to preserve the prerogative against the encroachments of the privilege of art, appointed Sir Richard Wallace, and, later on, even Lord Lamington (Mr. Baillie Cochrane) was preferred to Sir Frederick Leighton.

The twenty-ninth annual meeting of the Birkbeck Building Society was held Thursday (July 8th), in the theatre of the Birkbeck Literary Institution. The report presented to the meeting stated that the receipts for the year ending 31st March last, were £5,709,932, and the total from the commencement of the Society, £49,794,824. The deposits reached the large sum of £5,132,924. The gross profits earned by the Society amounted to £102,802, of which £86,586 have been appropriated to the payment of interest on shares and deposits, discount and expenses of management, leaving a net profit of £16,216. The surplus funds amount at the present time to £1,966,296, of which £300,458 is invested in Consols, New Three per Cents, and Exchequer and Treasury Bills; £219,275 in Metropolitan Board of Works and India Stocks; £542,757 in Colonial Bonds; £76,693 in Railway Debentures; £125,145 in French Treasury Bills, Foreign Railway Obligations, Bonds, &c.; £306,109 in gas, water, and miscellaneous securities; £214,914 in freehold ground-rents; while £180,943 is in cash. It is worthy of note that no portion of the funds appear to be invested in promissory notes, bills of Exchange, or personal securites of any kind. The total liabilities of the Society are £2,465,819, while the assets are £2,583,331, showing a net surplus of £117,512. Of this sum, £50,000 is invested in Consols as a permanent guarantee fund, leaving £67,512 to be carried forward to await the next declaration of a bonus. The number of investors and depositors is 38,814, while the shares in existence number 32,812, on which £180,396 have been paid up.

At a meeting of the St. Pancras Board of Works held on Monday night, a report was received from the sub-committee appointed on Wednesday last, stating that they had instructed the chief surveyor and the vestry clerk, to put themselves in communication with the secretary of the Chartered Gas Company. In reply to a letter addressed to the gas company, the following answer has been received :—" On the subject of your letter of the 7th inst. I am directed to say in reply that, while the company do not, under existing circumstances, admit their liability for the damage occasioned by the late explosions, yet with a view of carrying out without delay the works and repairs necessary to be done to the houses, streets, and sewers in your parish injured by the explosion, Messrs. Aird and Sons, the contractors, have received instructions forthwith to place themselves in communication with Mr. Scott, your surveyor, to arrange with him as to what is required to be done by them to carry out the works on behalf of the company." The chief surveyor had accordingly put himself in communication with the contractors, and a clerk of the works had been appointed to supervise the proper execution of the necessary works.

During the present year important additions will be made to the building of the British Museum. By the death of the widow of Mr. William White—who himself died as long ago as 1823—a sum of over sixty thousand pounds, the "White bequest," has become available for additional buildings. According to the suggestions at present before the Trustees, it is intended to expend a considerable sum in extending the accommodation available for Greek antiquities. This, it is understood, will be at once proceeded with. A substantial addition to the south-eastern side of the Museum is also contemplated. This is probably in the portion of the grounds abutting upon Montague-street, and known to officials as the Principal Librarian's garden. Here it was long ago proposed to erect suitable and complete accommodation for the Department of Prints and Drawings, which is in want of a public exhibition gallery as well as of further accommodation for its hidden treasures. Plans for such an extension in the spot mentioned were drawn during the term of office of Sir Antonio Panizzi at the Museum, and it is to this accommodation probably that allusion is intended.

A large gas-main in Church-street, Bilston, near Wolverhampton, exploded on Tuesday morning, tearing up the street for a distance of 100 yards. The accident was caused by a workman of the company applying a light to a hole in the road which he had picked in order to find the source of an escape of gas which has been going on for some time past. The gas had leaked from a defective service pipe into the sewers, permeating the soil of the roadway. A second explosion occurred in the afternoon, doing more damage than the first one, and this time some personal injuries were caused. During the work of repairing the damage caused by the explosion in the morning a strong smell of gas was perceived about 50 yards away from the scene of the first occurrence, and to discover whence the gas came workmen commenced breaking up the centre of the roadway. It is supposed that in the course of this process one of them either struck a corroded gas-pipe and pierced it, or that the aperture made in the surface released the pent-up gas, which had impregnated the soil underneath. Misfortunes of the same kind seldom come singly, and the apprehensions expressed by a correspondent in another column really deserve serious consideration. The coroner's jury returned a verdict on Tuesday, with regard to the Tottenham Court-road explosion, to the effect that the deaths were caused by an explosion, that that explosion was caused by a light being ignorantly placed to a pipe by the man Hawkes, the gas having been introduced into the new main by some defect in the valve in Howland-street. The jury appended to their verdict a rider giving it as their opinion that additional care should be taken by the Gas Light and Coke Company in the testing of new mains.

The seventh part of "Gloucestershire Notes and Queries," edited by the Rev. B. H. Blaeker, M.A., is to hand, and contains, as usual, a fund of interesting gleanings. On page 211 we find a note on Winstone parish-church, between Gloucester and Cirencester, restored in 1876, under the direction of Messrs. Waller and Son. The building consists of only nave and chancel, with south porch and small saddle-backed tower. Norman work occurs in the chancel-arch, nave, north window, and north and south doorways. One peculiarity of the church is, that there is no east window to the chancel—a peculiarity exhibited in one or two other churches in the neighbourhood. Traces of early painting have been found upon the chancel-arch and walls, but the colours were too friable to be preserved. It is thought, from the discovery of two coats, that the decoration was of more than one period. The Roman Villa at Chedworth, in the Cotswold Hills, is the subject of a note, which mentions that slabs of stone with Christian monogram X P are to be seen. Tesseræ of coloured stone were also found here some years ago. The villa stands on a terrace overlooking a vale, and is encircled by woods; its stone walls, 5ft. or 6ft. high, are nearly perfect, and have been roofed-in, so that the tesselated pavements, and the caldarium, &c., of the baths are now weather-proof. The present number contains notes on Fosbroke's and Grose's histories of Gloucestershire, Robert Raikes, The Gloucester Spa, Chavenge Manor House, Largest Oak in Britain, Severn Bridge Railway, Old Stone Pulpit in Pitchcombe Church, Church Font, Oldbury-on-Severn ; Monumental Inscriptions, &c.

CHIPS.

A public inquiry was held at Huntingdon, on Wednesday week, before Major Tulloch, R.E., on behalf of the Local Government Board, with reference to an application from the town council for sanction to a loan of £600 for the proposed extension of the area of the corporation waterworks. It was stated that, in 1875, the waterworks were formed, at a cost of £5,000, from the plans of Messrs. Easton and Anderson, but since 1878 there has been a gradual falling-off in the supply, owing to failure of the well, and it was now proposed to extend the pipes 1,000 yards to Brampton, to the gravel beds in that parish, which contained water. The work will be done under the superintendence of Mr. Robert Hutchinson, the borough surveyor.

The burial board for St. Neots, Hunts, last week, adopted a plan for laying out the new cemetery, submitted by Mr. J. Wood Ingram, of the firm of Wood and Ingram. The cost of the cemetery is estimated at about £2,500.

It is proposed to build and form a county museum, library, and school of art at Dorchester ; and more than half the required sum, £6,000, has been subscribed, and a suitable site has been presented, so that the scheme has every prospect of success.

The rural sanitary authority of Settle, North Lancashire, adopted, at their meeting on the 6th inst., the plans for new works of water-supply for the district of Bentham, prepared by Mr. Edward Firth, C.E., of Bakewell, and estimated to cost in execution £3,000.

A fresco painting has just been added to the great parish-church of St. Nicholas, Yarmouth, on the stone pillar against which the new pulpit has been erected. The subject is the Saviour calling Simon and Andrew from their fishing, and it is surrounded with the chevron ornament, fleur-de-lys, and other flowers. The artists were in the service of Messrs. J. M. Buckley and Co., of Wigmore-street, London, W.

At a public meeting held at Lancaster last week to consider the condition of the infirmary, it was resolved that it is absolutely necessary to provide separate premises for infectious cases, and the meeting was adjourned to consider whether the infirmary itself should be extended or rebuilt on a better site.

The church portion of the new cemetery at Langport, Somerset, was consecrated on Saturday week. The area of the cemetery, which is equally divided between Churchmen and Nonconformists, is an acre and a half. In the centre is a large chapel, Early English in style, and divided in the centre by a screen, so as to allow of use in two portions. It is built of blue lias stone with Hamstone dressings. Mr. Hall, of Mecklenburg-square, London, was the architect, and Mr. Davis, of Langport, the builder. The total cost of laying out, &c., has been £1,200.

Mr. Henry Robinson, M. Inst. C.E, has been appointed Professor of Land-surveying and Levelling at King's College, London.

New schools are about to be built in connection with Trinity Church, Brighton (well known in connection with Frederick Robertson). The plans have been prepared by Messrs. Holford, Clayton, and Black, architects, of Brighton.

Increasing business and important commissions in the South of England have decided Messrs. Dunn and Hansom to open offices in London, at No. 2, Westminster Chambers, Victoria-street, S.W. Their offices at Newcastle-on-Tyne will be continued as heretofore, and one of the partners will always reside there.

The members of Mr. Harry Hems's Exeter staff held their annual wayzgoose on Saturday. They proceeded in open brakes to Sidmouth, where a most enjoyable day was spent. After dinner, Mr. Frank Dyer, the senior employé, proposed Mr. Harry Hems's health, who responded in due course, after which Mr. George Harrison proposed that of the many members of the establishment at present away at distant contracts.

The foundation-stone of St. Paul's Church, Ferndale-road, Brixton, was laid on the 1st inst. The edifice is to be built of brick, with Bath-stone dressings and tracery windows, from the design of Messrs. Habershon and Fauckner, architects, of 38, Bloomsbury-square, the superintending architect being Mr. J. R. Manning. The building is to be covered in with tiles, fitted with galleries on both sides, and will afford sitting accommodation for about 1,600 persons. The total cost is estimated at about £8,000. The contract for the building has been intrusted to Messrs. D. C. Jones and Co., building contractors, Gloucester.

An adjourned meeting of the Birmingham School Board was held on the 8th inst., when Mr. Davis brought forward his motion for rescinding the arrangements with the present architects, Messrs. Martin and Chamberlain, and instructing the Sites and Buildings Committee to invite architects to send in plans for the next set of schools to be erected. To this an amendment was proposed, appointing Messrs. Martin and Chamberlain architects to the board at a salary of £250 per annum. The amendment was carried by 8 votes to 6.

A new library, and other additions, have just been completed at "River Meade," Sunbury-on-Thames, for Mr. L. Knight Bruce, from the designs of Messrs. Pugin, of Westminster. Mr. John Dalglish, of Sunbury, was the contractor.

The new market-hall in Carlton-street, Castleford, was opened on Monday. The length of the hall is 156ft. 9in. by 140ft., and the height to the ridge of the roof is 38ft. The market has four entrances, the principal one being in Carlton-street. In addition to the market hall an arcade has been erected, and this connects the hall with Carlton-street. Its length is 105ft., breadth 43ft., height to ridge of roof 31ft. On each side there are eight shops ; the materials used in building are pressed bricks, with stone dressings. The cost of the undertaking is estimated at £10,000. Messrs. Malcolm Paterson, Dewsbury, and Wm. Wheater, Albion-street, Leeds, have been the joint engineers for the work.

Two corner stones of a new school, in connection with the "Children's Home" (Lancashire branch), Edgeworth, near Bolton, were laid on Saturday afternoon last. The building, which is to be of stone, is being erected from designs prepared by Mr. Thomas Ormrod, architect, of Bolton, and will comprise schoolroom, and two class-rooms, to accommodate about 263 scholars, at an estimated cost of about £1,200, including boundary-walls and outbuildings, &c. Messrs. Martin Brothers, of Edgeworth, are the contractors for the building.

Extensive additions to the Angel Hotel, Salisbury, to provide increased bedroom accommodation, have been completed, under the superintendence of Mr. F. Bath, architect. Mr. Arthur Foley wss the builder, and also supplied the furniture and fittings required.

The Derbyshire Archæological Society had an excursion on Saturday last, when the parish-church and an old house at Norbury having been visited, the principal part of the day was spent at Ashbourne, where the fine church was seen under the guidance of the Rev. F. Gourdain, and also the Grammar School, erected in 1585, and the hall where Prince Charles slept on the return from Derby in 1745.

The Hove Commissioners, sitting as the Burial Board, yesterday, received a report from a committee, recommending the acceptance of the tender of Mr. G. B. Marshall, of Brighton, at £2,450, the lowest of seven received for the erection of a wall, lodge, and fences round the new cemetery, and also to appoint Mr. E. C. Morgan as clerk of the works, at a salary of £2 2s. per week.

A new Wesleyan chapel was opened in Derling-street, St. Catherine's, Lincoln, on Monday week. It is built of white brick, with stone dressings, and measures 46ft. by 34ft. Mr. Chas. Bell, of London, was the architect, and Messrs. Cowan and Lansdown, of Lincoln, the builders; the cost, including four class-rooms attached, has been £1,200.

The Oddfellows' Hall at Halifax was reopened on Monday, after reconstruction and redecoration. Messrs. J. Charnock and Son, of Pellow's-lane, carried out the joinery works, and Mr. Jonas Binns, of King's Cross, Yorkshire, designed and carried out the decorations.

At a meeting of the town council of Halifax, held on Wednesday week, it was reported that tenders had been received for making Royle's Head reservoir watertight, and to guarantee it for one year. The lowest sent in was over £1,400, which was considered too high, and Mr. Paskin, the waterworks engineer, had thereupon made a tender in writing that he would undertake to get the reservoir done by day-work, at a cost not to exceed £1,400, and that any excess he would pay himself, while the town should have any benefit. Several members of the council objected that while the offer was a plucky one, it was one that ought not to be taken from anyone in the employ of the Corporation. By a large majority, however, it was decided to accept Mr. Paskin's offer.

On Saturday afternoon the corner-stone of the new parish-church of Fulham was laid by the Archbishop of Canterbury. The church will be built in the Perpendicular style, from the designs of Mr. Blomfield, who will give the east window in memory of his father, the late Bishop; but the old tower, with its peal of bells, will remain untouched, and nothing will be destroyed that is worth preserving. The total estimated cost is £9,480.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

BAYSWATER.—For new warehouses, Queen's-road and Douglas-place, Bayswater, for W. Whiteley, Esq. Mr. J. E. Saunders, architect. Quantities by Messrs. Osborn and Russell :—

Cubitt and Co.	£99,824	0	0
Holland and Hannen	99,210	0	0
Adamson and Son	96,415	0	0
Ashby and Horner	92,890	0	0
Laurence	92,760	0	0
Brass	88,645	0	0

BERMONDSEY, S.E.—For alterations and additions to dwelling-houses in the Spa-road, for the Bermondsey Vestry :—

Drake, T. and F.	£347	0	0
Battley, T.	335	0	0
Brockwell	305	0	0
Almond, J.	279	0	0
Bullers	265	0	0
Eldridge and Gee (accepted)	221	0	0

BRIGHTON.—For alterations to No. 177, and new shop, 178, Western-road, Brighton. Mr. Arthur Loader, architect :—

Lockyer, G. R.	£834	0	0
Newnham, J. M.	777	0	0
Bruton, J.	750	0	0
Downer, W.	735	0	0

CARDIFF.—For improvements to Bute-street bridge, for the Town Council :—

Burton and Co. (accepted)	£881	0	0

(Borough surveyor's estimate, £1,000.)

CARDIFF.—For widening the approaches to Cathays Bridge, for the Town Council :—

Jones and Jepson (accepted)	£813	0	0

[Lowest tender received, the highest being £1,608, from a Newport firm. Borough surveyor's estimate, £980.]

CARDIFF.—For warehouse, for Mr. J. Isaac, Hope and Little Tredegar-streets. Mr. John P. Jones, architect :—

Jones, Bros., Cardiff	£1,170	0	0
Webb, Birmingham	1,158	0	0
Lock, Cardiff	1,112	0	0
Thomas ,,	1,074	0	0
Davies ,,	1,060	0	0
Elliott ,,	1,046	5	11
Shepton ,,	1,040	0	0
Purnell & Fry, Cardiff (accepted)	985	7	0

CHELSEA.—For the erection of Onslow College of Science and Art, King's-road. Messrs. T. Stokes and J. Arpin, 45, Walton-street, Brompton, architects :—

Belham and Co.	£1,895	0	0
Strong, Bros.	1,779	12	8
Stimpson and Co.	1,688	0	0
Smith, W. H.	1,651	0	0
Sharpe and Mills	1,645	0	0
Criske, C.	1,620	0	0
Holloway, J., Lavender Hill*	1,573	0	0

* Accepted.

CHELSEA.—For improvements and repairs to a school in Walton-street, Chelsea, accommodating 486 children, on transfer to the London School Board :—

Stimpson and Co.	£660	0	0
Hobson, J. D.	659	0	0
Hook and Oldrey	636	0	0
Nightingale, B. E., Albert Embankment, S.E. (accepted)	617	0	0

COLCHESTER.—For the erection of water-tanks in Military-road, for the service of the eastern part of the town. Mr. Clegg, borough surveyor :—

Oldridge, C. H., Colchester (accepted)	£254	10	0

[Lowest of eight tenders received.]

DURHAM.—For a fire-engine shed, for the Town Council :—

Taylor, J. (accepted)	£70	0	0

[Lowest of four tenders.]

HALIFAX.—For the new church in West Vale, near Halifax. Accepted tenders :—

Stone and mason work :—
Riley, M., Sowerby Bridge.

Joiner's work :—
Furness, E., Greetland.

Plumbing :—
Calvert, S., West Vale.

HALIFAX.—For the completion of Shroggs' Public Park, for the Town Council :—

For excavations, trenching, and draining in the park :—
Kendall, J. (accepted).

For completing boundary-walls and entrances :—
Pickles, J. (accepted).

For widening and improving Shroggs'-road :—
Kershaw, J. (accepted).

HAMPSTEAD.—For villa at Fitzjohn's-avenue, for Mr. Pettie, R.A. Mr. Wm. Wallace, architect. Quantities by Mr. F. Thomson :—

Richardson, Bros.	£7,995	0	0
Hunt, J. R.	7,645	0	0
Brass, W.	7,587	0	0
Manley, M.	7,530	0	0
Scrivener and Co.	7,490	0	0
White, R.	7,429	0	0
Woodward, J.	7,380	0	0
Toms, E.	7,359	0	0
Cox, E.	7,274	0	0
Taverner and Son	7,130	0	0
Dowsing and Sons (accepted)	6,497	0	0

HOVE, NEXT BRIGHTON.—For the erection of a lodge, walls, and fences, being contract No. 1 in connection with the new cemetery, for the Hove Commissioners :—

Ockenden	£3,310	0	0
Patching and Son	3,237	0	0
Parsons and Sons	3,060	0	0
Longley	2,943	0	0
Cheesman and Co.	2,766	0	0
Oliver	2,650	0	0
Marshall, J. G. B., Brighton*	2,450	0	0

* Accepted.

NORTHAMPTON.—For making a culvert in Kerr-street, for the Town Council :—

Wingrove, Kettering-road (accepted)	£123	5	6

[Highest tender received, £190.]

ILFRACOMBE.—For villa, Fortescue-place, for Mr. E. H. Lang. Mr. W. M. Robbins, architect :—
Parkyn (accepted).

ILFRACOMBE.—For labour to stables, Royal Clarence Hotel. Mr. W. M. Robbins, surveyor :—

Horwood	£110	0	0
Knill	86	10	0
Gibbs (accepted)	86	0	0

KINGSTHORPE, NEXT NORTHAMPTON.—For the sewerage of Arthur-street, for the Kingsthorpe Parochial Committee. Mr. Hull, surveyor :—

Green, Bros. (accepted)	£102	0	0

[Lowest of four tenders received.]

LIMEHOUSE, E.—The following tenders for sanitary work have been accepted by the Vestry of Limehouse for the ensuing year :—For cleansing, dusting, and water, No. 1 district, P. and E. Abbott, reduced from £2,465 to £2,365; No. 2 district, Parsons, from £1,398 to £1,320; No. 3 district, Rollinson, from £780 to £765.

LONDON.—For rebuilding premises in the Poultry. Msssrs. Ford and Hesketh, architects :—

Scrivener and Co.	£3,274	0	0
Dove, Bros.	3,155	0	9
Mowlem and Co.	3,123	0	0
Mark	3,000	0	0
Brass	2,950	0	0
Macey and Sons	2,933	0	0
Lawrence	2,722	0	0
Sabey and Son	2,717	0	0
Conder	2,605	0	0

LONDON, E.C.—For the erection of a school to provide accommodation for 1,400 children, in Compton-street, Goswell-road, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Scrivener, W. and Co.	£15,792	0	0
Tongue, W.	13,991	0	0
Thompson, J.	13,920	0	0
Higgs and Hill	13,850	0	0
Brass, W.	13,665	0	0
Boyce, T.	13,593	0	0
Kirk and Randall	13,551	0	0
Williams, G. S. S. and Son	13,478	0	0
Lawrance, E.	13,212	0	0
Grover, J.	13,181	0	0
Jerrard, S. J.	12,983	0	0
Atherton and Latta	12,800	0	0
Wall, Bros., Dale-road, Kentish Town (accepted)	12,447	0	0

[Cost of site (area 14,630 square feet), £15,448 11s. 11d.; cost of (*a*) school buildings only, including closets, £10,247; (*b*) tar pavement and playground, £166; (*c*) boundary walls and gates, £329; (*d*) teachers' rooms, £300; (*e*) schoolkeeper's residence, £350; for special expenses, properly chargeable to site, viz.: cost of (*f*) extra depth of foundations, £405; (*g*) works to adjoining premises, £650; total, £12,447. Cost per head of (*a*), (*b*), and (*c*), £7 13s. 5d.; total cost per head, £8 17s. 9d.]

LONDON, E.C.—For cleaning, painting, and repairing the premises of the School Board for London, Victoria Embankment. Mr. E. R. Robson, architect to the Board :—

	Main Building.			Stores.			Total.		
Kershaw, T.	£1,756	0	0	£40	0	0	£1,796	0	0
Crace, J. G. and Son	1,398	0	0	60	0	0	1,458	0	0
Trollope, G. and Son	1,199	0	0	61	0	0	1,260	0	0
Durant, C. (late Arnold), Jermyn-st.*	1,088	4	7	52	10	0	1,140	14	7

* Accepted. Cost as estimated, £1,500.

NEWARK-ON-TRENT.—For the erection of six residences situate in Harcourt-street, Newark, Notts., for the Mayor of Newark. Mr. R. W. G. Hayward, architect and surveyor, 6, Bar-gate, Newark :—

Messrs. Baines and Mackenzie's tender :—

Excavator and bricklayer	£814	0	0
Mason	56	0	0
Carpenter & joiner (including spouting)	666	0	0
Slater	70	0	0
Plasterer	147	0	0
Glazier and plumber	56	0	0
Painter	31	17	6
	£1,840	17	6

Mr. Cosham's tender :—

Excavator and bricklayer	£660	0	0
Mason (Brown and Sons)	65	5	0
Carpenter and joiner	533	2	0
Slater (Dobbs)	75	0	0
Plasterer	144	0	0
Plumber and glazier (Bousfield)	61	3	0
Sundries	18	7	6
Painter (Cubley)	31	17	6
	£1,588	15	0

Crossland, F.	£1,429	12	0
Hurst, J.	1,419	0	0

Mr. W. R. Whate's tender :—

Excavator and bricklayer	£621	11	2
Mason (Brown and Sons)	65	5	0
Carpenter and joiner (Hurst)	440	0	0
Slater (Dobbs)	75	6	0
Plasterer	104	17	4
Glazier and plumber (Bousfield)	61	3	0
Painter (Cubley)	31	17	6
	£1,400	0	0

Mr. C. Lane's tender :—

Excavator and bricklayer	£591	0	0
Mason	61	0	0
Carpenter and joiner	430	0	0
Slater (Dobbs)	75	6	0
Plasterer (Cosham)	120	0	0
Glazier and plumber (Bousfield)	61	3	0
Painter (Cubley)	31	17	6
(Accepted)	£1,370	6	6

NEW SHOREHAM.—For Baptist chapel, New Shoreham, Sussex. Mr. Arthur Loader, architect, Brighton :—

Burstow, S.	£1,278	0	0
Stow, T.	1,250	0	0
Nownham	1,230	0	0
Burchell	1,210	0	0
Curd, C.	1,210	0	0
Bruton, J. (accepted)	1,200	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 23, 1880.

THE NATIONAL COMPETITION PRIZE DRAWINGS AT SOUTH KENSINGTON.

THE competition prize drawings now on view in the Galleries next the Horticultural Gardens at South Kensington are certainly quite up to the average of the last few years. Though we hear that the number of works has considerably exceeded that of recent exhibitions, the prize drawings and models have been arranged with more economy within the two galleries which they occupied last time, and they are not so crowded. We have still fault to find with the want of classification; the designs, such as wall-papers, those for textile fabrics, decoration, &c., are mixed up rather indiscriminately with drawings from casts, paintings, &c., and we find, as we did on the previous occasions, that the architectural designs have been placed in two or three parts of the room, widely separated from one another, so that it gives those who are desirous of comparing the results in one class some trouble to find the drawings. We notice, for instance, the designs for a church have been scattered in two or three extreme corners of the room. We may, as usual, begin by referring to these works, and we are glad to find a higher degree of merit evinced, and not quite such a craving after ornament and crowded detail that we have had to complain of on previous occasions. A design for a Cathedral Church has enlisted several attempts. Alfred Williamson, Leeds, receives the silver medal for a set of elaborate drawings, showing a Decorated church, with western towers, finished with spires, and a flèche over crossing. The gabled niches over west doorway, and the windows of the towers, are a trifle laboured in effect, and the proportions of towers are not very happy; but the detail is good, despite the rather scratchy drawing. The brown tints in belfry windows and doors rather spoil the effect. Mr. Gilbert S. Doughty, Nottingham, who also receives a silver medal, shows a bolder drawing. The church is cruciform, with a central spire of two stages, but we hardly like the manner in which the octagon stage springs from the square. Western towers are shown also; the style is Middle Pointed, and the tracery well drawn; the effect of the east end is somewhat jumbled. Better than either of the above is A. Marshall's "Study for a Church," in the Italian Renaissance style, though we do not see any prize has been given to it. It shows a long plan, with circular apse, including nave and aisles, with a central dome over crossing, and a detached campanile at the west end. The latter, and the general treatment and detail, are meritorious, and the flank elevation and perspective view in ink are cleverly drawn, if we except a rather confused effect in the shading of the latter. The baptistry and treatment of aisle are pleasing features. The silver medal is awarded to F. Brown, of Westminster Royal Architectural Museum, for his design for a country house in a Jacobean style. The work is quietly conceived, and the features are feelingly rendered with characteristic detail. The treatment is brick and parget. A Late Gothic design for the same subject, by A. W. Cross, Hastings, and St. Leonard's, is also a creditable drawing, and worthy the book-prize. Arthur W. Brewill, Notts, receives a bronze medal for a design for a free library and museum, Gothic; the tower is the best feature, but the hatched shading to the buttresses is not done in the proper manner. J. Diplock's (Brighton) design for a similar building in Gothic is creditable in detail, though the central tower looks a little high-shouldered.

We must speak in praise of a few drawings from measurements. S. Llewellyn takes the silver medal for the drawing of a villa, very neatly drawn, coloured and shaded, and A. Whitehead receives bronze medal for the same. Designs for art and science schools, by G. Wood (bronze medal), has character, but the drawing is heavy in tinting. A bronze medal is fairly won, also, by Alex. Greeble, Dundee, for his nicely shaded elevation of Ionic entrance to Custom-house. A very interesting drawing from measurement, by J. H. Brierley, Halifax, is shown of an old carved oak fireplace of the 16th century, from the "Old Cock Hotel," in which occurs some very quaint and grotesque carving in panel over the mantel. J. Walsh's drawing of it is rather the clearest. A book-prize is won by some neatly-drawn details of Chapter-house, St. Mary's Abbey, Furness, by Perkin; and W. Stevenson, Edinburgh, receives a bronze medal for an interesting study of Celtic ornament in pencil. In decorative designs there are several very creditable works, though the prizes have not in all cases fallen to those most deserving of distinction. A gold medal is given to John W. Bradburn, Coalbrookdale, for a design for a plaster ceiling for a synagogue. The panels are well arranged, but the ornament in the marginal spaces is more naturalistic than we like; the author has profusely introduced the vine, and we much prefer the conventional ornamentation in the centre panel. The emblematic panels surrounding the ceiling are the chief features, and the whole is beautifully drawn in light ink, shaded in part. Another gold medal is awarded to F. Gibbons, Cirencester, for a tesselated pavement, in which a good arrangement of panels in a Greco-Roman style, and a harmony of low-toned colours relieved by white in the ground apappears; the tesseræ are shown. Another design, by W. B. Pratt (Cirencester), exhibits signs of the Zodiac, but the arrangement lacks composition. J. Procter, Burslem, receives a bronze medal for wall decoration; the open arch, with figures in blue, shaded in perspective, is not a rational treatment of a flat surface; but we have more fault to find with the design for ball-room decoration, which obtains the silver medal (A. Hall, Cirencester), notwithstanding it was awarded the first prize by the Plasterers' Company. The arabesques, springing from a vase-like composition between the pilasters, the figures of Adam and Eve, and the ornament in dado and frieze, are very coarse and tawdry; there is a want of scale in the parts, and of solidity in the dado. The drawing is neatly shaded in sepia. The second Plasterers' prize is given to a design much more refined, and, we may add, deserving of distinction. Ironwork, as usual, is largely competed for. The silver medal goes to W. G. Thomas, of the Architectural Museum, Westminster, for a design for wrought-iron gates in a good Classical style; the compartments are divided into panels by pilasters, and some of the ornamental detail is clever; but we like quite as well the bronze medal design by F. Fidler, Sheffield, where the scrollwork has been spiritedly drawn in good taste, and the piers are well designed. W. H. Sherburne, Rotherham, wins a bronze medal for park gates, which are spoilt by the heavy outline and overcrowded ornament; the book-prize is bestowed on the same student for some spirited sketches of old ironwork at Kiveston Hall, York Minster, and the Temple Gardens. In decoration and furniture we must note a few other drawings. M. Haye's bronze medal design for dining-room decoration is heavily coloured, and the detail rather coarse. J. Castle, Manchester, obtains a book-prize for a nice design for paper; the gray-tinted ground is pleasingly relieved by brown leaves in tufts and pinkish flowers, and a free natural rendering has been adopted. The Elizabethan fireplace, by J. Morgan, Lancaster, suffers from overcrowded detail; and the best design for furniture is that by W. Lock, of Belfast, whose reward (a book-prize) is surely an unworthy recompense for the well-proportioned and exquisitely-treated sideboard he exhibits. The composition, and its division into three pediments, the good outline, and the refined taste shown in the detail, well deserved a silver medal; the drawing, on grey paper, toned with brown, is also excellent. The same prize is awarded to J. Henderson, Dundee, for a chimney-piece and firegrate, neatly drawn in sepia. In metalwork justice also seems to have miscarried grossly. How a silver medal could have been given to the cup design (A. Hall, Cirencester) we are puzzled; the figures are caricatures, and the design equally bad. S. Thorpe's striking and vigorous design for fire-dogs is infinitely more deserving, though it only receives a bronze medal. A silver medal is won by H. Tidmarsh, a well-known artist in plate, for his Republican shield, in which the figures are ably drawn, and are disposed in six medallions round a centre, with the motto. Mr. G. W. Rhead's design is also meritorious, and worthy of distinction. J. Benson obtains a bronze medal for a clever tankard, and a chastely-designed loving-cup, by Smith, Coalbrookdale, a silver medal. A. Winterbottom's (Sheffield) spirited and elegant design for fruit-dish, with engraved glass, is certainly worthy of a higher prize than has been given to it; it is tastefully drawn and tinted. We must not omit to add that the gold medal has been won by W. Kitson, Architectural Museum, Westminster, for a clever-modelled design.

Lace design is, perhaps, not quite so well represented as it was last year. A gold medal is won by Mary Joyce, Dover, for a pillow-lace handkerchief, collar and cuffs; the design is a natural rendering of flowers and leaves, and is appropriately treated. Z. Inman, Birkenhead, takes a silver medal for a conventionalised treatment of lace handkerchief, of decided merit, but we do not notice any work from Nottingham this time. We can only bestow a glance on two or three of the prize drawings in oil; one is distinguished by a gold medal, the work of W. P. Watson, consisting of an old chair with tankard and drapery, the composition, colouring, and grouping being meritorious, and the handling vigorous; and another, a similar group by D. Anderson, receives a silver medal, the same distinction being bestowed on the oil-study by J. Clark. A silver medal is also given to an oil bust from the antique, a very vigorous study, by T. Alison, Edinburgh. In the chalk studies we find many striking drawings, evincing a high degree of merit. Edinburgh and Brighton distinguish themselves, the gold medal being won by Geo. Bathgate, Edinburgh, for a drawing of the Laocöon, and by Miss Amy Scott, Brighton, for a drawing of figure from the antique. Birmingham also takes a silver medal for a drawing of figure from life, by J. C. Carr; and Arthur McCormick, Belfast, wins the same prize for a head from the antique. Of the London Schools—Bloomsbury and Lambeth are conspicuous; F. Marshall, of the former, takes a silver medal, so also does Constance Brooker, of the latter place. C. Stephenson, Bradford, of the Grammar School, and G. H. Elliott, of the same town, receive gold medals for groups of water-colours. In the second gallery there are some very creditable works; we notice, for instance, a few oil studies in monochrome, from the cast, by students of the National Art-Training School, particularly the panels of surface ornament, by Elton Edgar, W. F. White, Whitehead, Llewellyn, &c., and a well-painted lion's head cornice, by Lane. The design for church, by Hubert G. Smith, shows a well-proportioned tower and spire, and neat drawing of detail; another design, by W. Walker, Hull, has a book prize for a cruciform church, showing a central spire, and good Early-English detail freely drawn; and a third is signed "Coulson." Why were not these drawings placed on the same screen with the prize designs? The design for country house signed "Strong" shows some careful drawings. The drawings of ironwork, Egyptian, Greek, and Mediæval ornament consigned to this gallery are evidence of the progress of our Art schools. In the Provinces, Bradford, Cirencester, Brighton, Edinburgh, and Coalbrookdale, stand prominent.

* * *

GAS AND GAS-WORKS.[*]

THE construction of gas-works has within recent years become a special branch of engineering, and has assumed the importance of a distinct art, so that there is scarcely needed an apology for a new work on the subject. Messrs. Crosby Lockwood and Co. have just brought out a new edition of the treatise originally written by the late Mr. Samuel Hughes, C.E., which has been rewritten and much enlarged by Mr. William Richards, C.E. It is scarcely necessary to say that a few years have made considerable changes in the production and development of gas as an important agent in heating and producing motive-power, as well as in that of illumination; and that Mr. Richards' treatise is almost a completely new work, inasmuch as its editor had to rewrite a large portion of the original treatise. From a glance at the contents of the new treatise, we find the author has embodied many of the more valuable results of experience, and the work may be usefully consulted as an elementary handbook on the construction of gas-works. After an historical sketch of gas-lighting, the chemistry of the subject is entered into with some fulness; these chapters we may pass over to consider the more practical portions of the book, and their bearing upon the construction of works. It is somewhat remarkable, by the way, that it was not till 1774 that the real properties of gas were known. Before that time, we find "inflammable air" spoken of as gas, and though explosions often occurred in coal mines, no scientific knowledge of the subject existed till the discoveries of Black, Priestley, Scheele, Rutherford, and others, revealed the secrets of the chemistry of gas. Soon afterwards, William Murdoch, in 1792, seems to have lighted his own house and offices at Redruth with gas made in iron retorts, and conveyed through tin, iron, and copper pipes. Chapter V., on "Carbonisation," is a practical introduction to gas-making. The value of clay and brick oven iron retorts is casually referred to; the author also makes some judicious remarks on the charges for retorts, their liability to incrustation; the advantage of White's "automatic valve" and other hints on the construction of retorts, &c. The following chapter deals with the choice of site for gas-works and the general plan of works. Of course one of the most important points is the means for the transport of coal: the works should be within convenient distance of a railway or river-side, though, as Mr. Richards says, it is not merely economy of transport which has to be considered but in everything connected with gas. He shows, for example, that with all the resources and appliances of the Beckton Gas-works, the largest establishment in the world, "it is not placed in a more favourable position than many of the medium-sized establishments, for the simple reason that its very magnitude necessitates extraordinary means of discharging vessels and transports, and it may be observed that works of the smallest description are capable of producing the same quantity of gas from a ton of any given coal as the largest, provided they employ the same vigilance and heats, with the same description of retorts, and in a few cases medium-sized works, by reason of their limited capital for a given quantity of gas produced, are placed in even more favourable conditions than the large works in question." The preliminary observations on the nature of the ground for a site, as regards foundations for the gas-holders, should be kept in view. In favourable soils, as clay, earth, or gravel, brick, stone, or concrete-made tanks for the gas-holders are the best, but in damp or bad soils an iron tank is necessary. Another leading consideration in planning gas-works is to provide for future extension. The retort-house especially should be capable of being doubled, and the gas-holders multiplied. Not less necessary is the desirability of placing the entrance nearest the locality to be supplied, with managers' and foremen's dwellings, and all store-rooms, offices, weighing-bridge, &c., in convenient proximity; while a further caution to avoid expense of transport is that the coal-stores, coke-spreading floor, and shed for coke should adjoin the retort-house. The purifying-house, tar-tank, lime, &c., are best in a separate part of the site, where they are least offensive. The practical value of this part of the treatise is enhanced by a plan of gas-works for a town of 10,000 inhabitants, designed by Mr. V. Wyatt, engineer of the Gaslight and Coal Company, which forms a good frontispiece to the work. The plan is drawn to a scale, and the dimensions of the different parts are figured. The plot of ground shown is 300ft. by 290ft. There is one entrance; on the right-hand corner is the manager's house and offices, on the left side of ground a space is cut off for two tanks with gas-holders 70ft. by 20ft. deep. Along the side opposite the entrance is a range of buildings, including the purifying-house, 40ft. by 30ft., lime-shed, boiler and engine-house, while the coals and retort-house, 60ft. by 50ft., with the chimney, occupy the centre of the area of the coke-yard, allowing of space for extension. The elevations of the buildings are designed in a suitable style, and form pleasing rather than unsightly structures. Indeed, we may observe that unsightliness springs as often from a wasteful use of material as from any other cause; these buildings are made to partake of shapes ill-suited to the requirements. The author, speaking of capital required says: for modern works from £500 to £800 per million feet per annum is about sufficient, or from 25s. to 35s. per head. Detailed information will be found of the different buildings. As regards the dimensions of retort-houses, little definite is given, as so much depends on the setting and number of retorts. They are now often built 75ft. wide; the largest at the Beckton works are 100ft. in width, and 480ft. long. The author says: "In small works the retort-house is usually about 26ft. wide, which, allowing 12ft. for the width of the retort stack, with the space usually left between it and the wall, together with the mouth-pieces, leaves 14ft. clear for working." Between the ends of the stack and the walls there should be a space to prevent bulging of the walls by heat. Various other details as to roofing, walls, are given; but these, of course, vary, and depend on requirements. Iron sheets for covering roofs of retort-houses are, however, found not to last long, seldom exceeding seven years, and the writer recommends slates, which are no doubt much the best. The future requirements of the locality render it necessary to make ample provision for enlargement and other contingencies. Next the retort-house it is necessary to have the coal-store, and the size of this depends on the means of transport; if near a river or canal, the larger it is the better it will serve during the probabilities of frost or delay of vessel. The purifying-house has generally open sides, and ample means of ventilation to carry away the gases, and the roof should be covered with tiles or slates, as iron is quickly corroded by the action of the sulphur from the waste. The author gives some practical advice on the building of chimneys or stacks; the square form is the cheapest, and a detached shaft is advisable. They are generally lined with firebrick a part at least of the height, a space being left between for a current of air. A hint is given that every eighth or tenth course should be tied with hoop-iron to prevent cracking. A few useful figures are furnished. On favourable ground the price of a square chimney 35ft. high, with an internal area of 4 square feet, will not exceed £35. A circular or octagonal shaft, 8ft. internal area and 60ft. high, will cost about £85. A stack of similar form of 10ft. area and 100ft. high is put down at £180 to £200. If no nuisance is likely to arise a chimney of 45ft. high is considered sufficient. Chapter VII. treats on retort-settings, the evils of iron retorts, form of furnaces; and sections of retorts are given applicable to both cast iron and clay retorts. The hydraulic main and valves are next described in detail, and the two kinds of valves, the hydraulic and the slide-valve, are explained. The latter have acquired a fresh interest from the recent explosion in Tottenham-court-road. The author says: "Hydraulic valves are now only used in gas-works, and never in the streets. They have the advantage of not being liable to leakage like some slide-valves, and shut off the gas very effectually, but they have the disadvantage that an accidental access of pressure renders them useless." Chapters on the "exhauster," "condenser," the "scrubber," "wet and dry lime purifiers," and other methods of purification will be found to contain all recent processes. Gasholders have a separate chapter devoted to them. The tanks are described in detail, the thickness of the brickwork is given for different sizes, and a specification for a gas-holder tank 33ft. diameter suitable for a holder 32ft. diameter and 12ft. deep is furnished, besides specification of cast-iron tanks. Gas-holders of single-lift and telescopic construction are fully entered into; a full specification is furnished of gas-works of different sizes, from which the student will obtain a practical knowledge of details. The photometer and methods of testing gas, the governor, the pressure gauge, and other appliances form the subjects of separate chapters. The distribution of gas, the mains, and services have particular interest, and especially have the remarks on meters, of which several kinds are described, from the first meter of Clegg to the dry meters of Malam and Richards. Passing by a chapter ou burners and glasses, we note a remark on gas-explosions, which, from the recent calamity, receives additional interest. One paragraph is written in remarkable ignorance of what has recently happened. We may quote another passage bearing upon the laying of mains. "Accidents have frequently occurred when laying mains, often occasioned by a bladder-valve which has permitted a small portion of gas to pass into the main beyond it, where the explosive compound was formed, and by the merest hazard, a neighbouring light has produced the calamity; therefore, in laying mains, when practicable, it is always better to have a sheet-iron temporary valve. This is done by placing a thin sheet of iron between the spigots of two pipes at the point where the stoppage is required, which may be clayed or cemented round to prevent leakage of gas." Again, lazy workmen prefer the gouge to the drill. In the concluding remarks, the author reviews some of the recent improvements that have taken place in gas-manufacture, the evil effects of the "dip pipe," the means adopted for purifying gas, the propulsion of gas through the mains, &c. A good index at the end renders Mr. Richards' new edition a compendious manual of gas-manufacture as it now is, and we can safely add our testimony to its practical value.

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[*] The Construction of Gas-works, &c. By Samuel Hughes, C.E. 6th Edition. Rewritten and enlarged by William Richards, C.E. London: Crosby Lockwood and Co.

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INSTITUTE OF ART.

LAST Monday, there was a special exhibition of fine-art work, pictures, &c., opened at the galleries of the Institute of Art, 9, Conduit-street, under the management of a number of distinguished ladies, which sufficiently indicates the growth of this society. It is needless for us to add to our previous testimony of the good the Institute is doing in encouraging artistic taste among ladies and others who are desirous of making their works known, and of obtaining a ready sale for their handiwork. On our visit at the "private view," we noticed a large accession of fresh work. In the department of needlework, for example, we may mention a few curtains, valances, quilts, tablecloths, furniture-covers of excellent design and colour. The work sent by Miss E. Wemyss, designed and worked at her Castle Needlework School, display the two qualities of good art workmanship in a special degree. Take, for instance, the tablecloths or covers of handwoven linen, one worked with the design of a conventionalised thistle in crewels; another with a darned yellow ground, covered with a rich floral pattern in brown, from an old design; a third, a curtain with a beautiful lily border in shades of brown, with green leaves; a piano-cover, enriched by leaves and flowers in excellent colours. A very striking design for a six-panel screen, by Miss Wemyss, and executed by that lady, is hung on the wall; the lines of the pattern are zig-zags, filled in with conventional foliage in deep reds and browns, and the conception is deserving of praise as a vigorous adaptation of needlework for such a purpose. We must also call attention to a handsomely-worked sunflower border, on a summer rug, on a dark ground; a curtain, with handsome foliage-border embroidered on a rich maroon velvet, by Lady Harington; some beautiful embroidery, by Lady Constance Stanley; a quilt, by Lady Adelaide Taylor, and particularly to a chimney-piece valance, and a boldly-designed border in embroidery on golden plush velvet, for fireplace curtains, by the Working Ladies' Guild. The same Guild sends some large curtains, of satin sheeting, embroidered with sunflowers, which are remarkable for boldness of design and spirited workmanship. Nor must we pass by a portière curtain, of good design; a banner, worked on gold satin sheeting by Mrs. J. Elliott, &c. In lace-work, the old Cardinal point-lace flounce, exhibited by Lady Constance Kennedy, and the specimen of old Greek point-lace—a vigorous design, quite in the Byzantine spirit, representing the Siege of Troy—lent by Mrs. Eman, are themselves priceless remnants in this class, which contains also some fine specimens of Italian and English point-laces. Painting on cloth forms another feature of the exhibition, of which we can only mention a painted screen, by Lady Camilla Fortescue, in which arums are introduced in a naturalistic manner. Painted china plates are numerous. Miss C. L. Nichol's study of chrysanthemums on a green ground is a work of taste and feeling. We also notice some china-painting by Ellen Hue, of the Isle of Wight, in which natural flowers, gorse, and violets have been very prettily introduced; some terra-cotta painting, and a fine china tea-service, exhibited by Lady Dorothy Nevill, of Oriental design. Mr. Guneison's model of a dead dove, in leather, is an extremely interesting piece of work, displaying dexterous manipulation in the feathers. Another of the special exhibits is a tablet, executed by Gen. L. F. Hamilton, in which inlays, in the form of panels, are introduced, with devices taken from ancient Greek forms, found in the Treasury of Atreus and Tomb of Agamemnon by Dr. Schliemann, and many small disc designs are introduced in the borders. The same gentleman exhibits some marqueterie copied from an old oak Florentine cassone.

In the gallery set apart for oils and water-colours, we see several clever works. Lord Hardinge's "View in Normandy" is a striking oil study; Lord Colville also sends a bridge-scene on the river Oich. Mr. O. D. Scullard, whose marine studies we spoke of highly in the last exhibition, exhibits one or two masterly pictures, characterised by the skilful management of high lights in the clouds and water, and by a breadth and impasto treatment of pigment. The "Moonlit Sea," by Miss Hortense Wood, surpasses even her former work in the rendering of the lights. The "Pastel Head," by Miss Corkham, is pleasing, and almost emulates oil, while the flower-subjects are as numerous as ever, and we can only single out the grapes, by Mrs. Lush; "Irises," a charming study, by Mrs. Stapleton; "Roses," by Miss E. Bywater; "Jonquils," by Miss G. F. Jackson. Of other subjects, we note "Old Houghton Hall," and the "E. Cloister of Westminster," by Edith Cane; H. Medliscott's "Grand Canal, Venice," and Miss Cane's vigorous study of Irish scenery. Lady Durrant, Lady Dunbar, and Miss Murray are also represented by some creditable productions.

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INDUSTRIAL AND FINE ART EXHIBITION AT BOW.

AN exhibition of more than usual merit has been opened at the Bow and Bromley Institute, a building erected by the North-London Railway Company, and which, besides serving the purposes of an Institute, also forms a station on that company's line. The large hall of the Institute, with its fine organ, presents an unusually gay appearance, from the numerous collection of objects of fine art and industry brought together; and through the patronage of the Lord Mayor and Sheriffs of London, the Worshipful the Clothworkers' and Coopers' Companies, and other distinguished names, the industrial exhibits have been enhanced by the acquisition of numerous loans. Among these we cannot omit to mention the display of painted china, stained glass, and decorative objects made by T. Cox, of 49, Southampton-row. The staircases leading to the hall have been adorned with numerous cartoons, some by well-known artists, for stained-glass windows and mural decoration, while the hall itself is bedecked with real painted glass, which has toned the light coming through the windows, and has given a rich and variegated effect to the interior. The same artist has a stall filled with many artistically-painted plaques and vases, a special feature being the flowers painted in relief upon plaques, and upon terra-cotta, the dull ground of the latter increasing the contrast of the raised and glazed flowers. The roses and honeysuckle are particularly striking plaques; and the blue-painted china vases handsome and spirited. Messrs. Doulton send a well-selected stall of their artistic ware, with some beautiful "impasto" designs; and Messrs. Josiah Wedgwood and Sons, of St. Andrew's-circus, Holborn, some unique specimens of Wedgwood jasper vases, in pale blue, black, and sage. The Japanese collection, lent by Mr. Wilberforce Bryant, of Surbiton-hill, contains some choice lacquer work, and old Kaga and Satzuma ware. But to proceed to the industrial exhibits: the Mechanical class contains some remarkable manifestations of ability and perseverance, illustrating dexterous handwork and the power of the artist over his materials. Among models, that ever-prolific field for the energy of ingenious minds, there are several of singular merit. The York Minster, in cardboard, by J. Dickinson, of Tredegar-square, and the model of a country villa in the Tudor style, by F. Kempster, an architect's assistant, West Ham, are both clever. A labourer exhibits a model of a village church and font, a warehouseman (W. J. Washbrook), the London, Chatham, and Dover Railway bridge at Blackfriars, and a doll-maker exhibits a model of Bow Church. In another class we find a working engine made out of vulcanite, by W. J. Ricketts, a tortoiseshell-manufacturer, of the locality. In models of vessels the outrigger racing-boats, exhibited by J. F. Porter, Vauxhall-bridge-road, and the steamship model of steel, made by J. E. Powell, of Highbury-park, call for particular notice. Workers in this class will value the splendid models lent by the Thames Ironworks Company, &c. Mr. H. T. Grainger, engineer, New Church-road, Camberwell, exhibits his improvements in tramways by a series of models we have before described; a compositor shows a fog apparatus for railway signalling, and many useful builders' models are to be seen. We must direct attention to a very clever case of inventions shown by J. Goater, locksmith, Ponder's End, and numbered 60 in catalogue. One shows a wood model of safe which received a prize at Westminster, illustrating a new method of resisting opening; but we particularly note a model or section for building ironclads, "from stem to stern, and from keel to bulwark," without bolt, rivet, or screw; the joints are steamtight, and the same method is recommended for seawalls. An anchor-head, or double-clutch lock, is exhibited also. An ingenious mode of increasing the leverage in railway brakes is shown by S. Scourfield, of Mostyn-road, E., who also exhibits other things; and a cleverly-modelled chronometer-escapement, by A. G. Nelson, is shown.

The artistic exhibits are even more numerous and varied. In terra-cotta, stone, and china, we mark several works. W. Allan, of Lambeth, sends a good design for ceiling decoration, and one or two clever models of figures. H. Gunthorp, carver, Dulwich-road, sends a clever plaster medallion and figure; G. Dunn, designer to Messrs. Stiff and Sons, some vases and bowls, and H. Higgs a few carvings in Caen stone. The specimens of stoneware pottery exhibited by H. Hollins, a potter, at Bromley, are remarkable instances of ingenuity; the smoker's friend, one of the exhibits, combines, when put together, a tobacco-jar, a spittoon which forms a pedestal, also a barrel for beer, a cup, and a jar for spills, and other puzzles in stoneware are to be seen; another collection of stoneware contains a variety of chemical apparatus, taps, &c. A silver dish with spirited relievo figures, by Middleton, an embosser, of Islington, has been purchased by H. Herkomer, A.R.A., one of the adjudicators. We notice also a china plaque by Miss Price, a china-painter, Vassall-road, S.W.; some dessert-plates, hand-painted, a few cleverly-painted china plates by Mrs. W. Smith, an artist, Crouch-hill; chasing in copper, and specimens of repoussé work in brass, by J. Sparkes, Herne-hill. Carving in wood and ivory, fretwork, and other kinds of ornamental work form a large section. A corn-merchant, a type-cutter, a French polisher, a boot-maker, a butcher have turned their hands to these branches of art; the fretwork inkstand, by L. Franks, and especially the flower-stand and bedroom suite of models by J. Sparrow, demand notice for good outline and artistic forms of ornament, though we find several crude attempts in design by other exhibitors. The oil-paintings are below criticism, the best being by a chemist, entitled "Hengrove, near Margate," and "Out in the Cold," by a policeman, No. 163. These works are the productions of miscellaneous workers, labourers, warehousemen, railway-guards, pawnbrokers'-assistants, letter-sorters, carmen, &c., therefore, we cannot expect to find attention to the rules of perspective, as in No. 169. The few water-colour drawings are open to the same remarks, the best we saw being the "Time Sketches," exhibited by Miss West, art student, Poplar, and a study of shells, &c., by the same artist, Nos. 232, 233. Crayon and pencil drawings are numerous, and the few architectural designs are interesting, if only as furnishing the psychological observer of art with the impulses of untrained ideas in that direction. Needlework is a large class. We can only single out a well-executed piece of tapestry by T. Beaton (333), some patchwork quilts, crochet, and other kinds of needlework. Berlin-wool work is well shown by Mrs. Harris in 415, and wool flowers and pictures are more abundant than tasteful. In a lower and smaller room a pleasing collection of models and artistic works, by youths under 18, are shown, among them a working model, in cardboard, of a locomotive engine, by W. A. Clatworthy, an engineer's pupil, a remarkable specimen of juvenile workmanship; a slate chimney-piece, by an apprentice, while we must not overlook a two-wheel hand-truck, turned out in a thoroughly workmanlike manner, by a boy aged only 15 years. The vases exhibited by W. Dunn, a decorator with Messrs. Stiff and Sons, a lad only 14, are very praiseworthy. We notice, too, a plan and elevation of Bushey Church, by Emery, a pupil-teacher; and some ink sketches, pottery, &c., by F. Haite, No. 458; painted glass by an apprentice, 447; but we must cut short our notes, expressing a hope that the exhibition will be the forerunner of others in the neighbourhood. To the secretary, Mr. Parr, and the manager, Mr. Boxall, praise is due for the arrangements.

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LECTURES ON ART.*

A VERY readable book has just been published, containing the lectures on art delivered at the Royal Academy, by the late Henry Weekes, R.A., Professor of Sculpture. Written in an easy and popular style, the lectures are, nevertheless, marked by sound views on art, and by well-reasoned advice, which may be profitably accepted and applied by all students, whether of sculpture, painting, or architecture. The book is prefaced by a memoir of the author's life, from which we gather that the young sculptor was articled to Behnes, the celebrated portrait-sculptor, that afterwards, in 1823, he became a student of the Royal Academy, where he was a regular attendant of the evening life-school, and obtained the silver medal, and was afterwards in the employment of Sir Francis Chantrey as a modeller, in which capacity he soon attracted the notice of his master. Launched on his own account, commissions soon poured in upon him. A Royal command for a bust of Her Majesty the Queen, to be presented to the Duchess of Kent, was a stroke of fortune, soon after which other patronage fell to his share. Sir Francis Chantrey, in proof of his esteem for his young assistant, left the young artist a legacy, and a request to his executors that Weekes should complete his unfinished works. By the aid of this bequest he purchased Chantrey's studio, and so placed himself in the position of his master's successor, a step which soon secured for him extensive patronage as a sculptor.

Dipping into the eighteen lectures, we find some excellent remarks on composition. Speaking of the selection of a subject, he observes that one that harmonises most with the student's "inward feelings, or that appeals most strongly to the nature within him," is to be preferred; in other words, he recommends the expression of individuality. As if to qualify this opinion, he says the subject should be suitable to the art itself—suggestive, not wholly an imitative one. The thought conveyed must suggest other and higher thoughts. Examining the subjects suitable, Mr. Weekes does not implicitly advise ancient models, though he carefully guards his reader against making sculpture imitative. To illustrate his meaning he refers to Byron's beautiful lines on the "Dying Gladiator," and places great dependence on that poet's views. In fact, he believes Byron had the sort of imaginative mind that could appreciate the abstract beauty of sculpture. Another wholesome maxim of Weekes' is to "look out of the profession for opinions." We entirely go with the author when he thinks our sympathy with mythological deities is to a large extent lost, and it is for this reason we have always held the desirability of not fettering the student with academic models, while avoiding, on the other hand, imitation, which is often degrading in its tendency. The author shows clearly that the two principles are not opposed. Biblical subjects are fitted for sculpture, as they are suggestive; but the horror associated with such a subject as the Murder of the Innocents is pronounced unsuitable, and it is evident from every line of these lectures that Weekes was one of those tender-hearted men who instinctively shrunk from the painful and sad in human nature. He naturally expresses revolt against the personification of repulsive incidents like that of the Starvation of Count Ugolino and his family, by Michael Angelo and Flaxman. In another lecture *form* and *line* are carefully defined—form as representing the bulk of the whole, line as meaning the general direction of that form. This last may be horizontal, as in repose; perpendicular, as in life; and quietude, or slanting, as in action, more or less violent. These distinctive attributes of form and line are illustrated in Egyptian and Greco-Roman sculpture, the first representing repose, the latter, as in the Fighting Gladiator, action and energetic movement. One piece of good advice is given, to the effect that strong action is objectionable, and ought to be avoided; it is the resort of inferior artists. In groups there is obviously less objection to action, as the cause becomes more apparent than in single figures; an illustration of this is found in the statues of the Discobolos. Reference is made to the ruling lines of architecture in determining the outline of groups, as in the Niobe and children. Drapery is not forgotten. The indication of the lines of drapery as expressing rather than concealing the action and the limbs is an important point often disregarded; and the author instances the groups in the British Museum, as Ceres and Proserpine from the Parthenon, as good lessons in drapery. A very useful remark is made touching the limitation of the sculptor's means in separating or subdividing his composition; he cannot resort to colour or fixed light and shade, like the painter, but must show the distinction by contrast of texture, or by opposition in the lines of drapery or the breadth of folds. The figures in the metopes in the Parthenon are illustrations. "Beauty" forms the subject of a lecture. Our author disagrees with Flaxman's view, and associates it with utility; that is, the beauty of a figure depends in the representation of all its organs in a state most suited to the use they are intended for. Each object has its peculiar beauty. Though not stated in the most philosophical way, the idea is a just one. The observations on Style and Mannerism are to the point; we quite agree with Weekes in saying there is a more than usual amount of mannerism passing for style just now, both among sculptors, and other artists as well; but this lecture, as many others do, suffers from the almost necessary verbosity and laxity of expression due to this form of composition. Mr. Weekes also judiciously points to the value of Idealism in Sculpture, and to the tendency in exhibitions, in deference to public taste, to pander to Realism. The former elevates and dignifies the work of the artist, the latter lowers and degrades it. In sculpture, as the author holds, the abstract in Nature should be the essence, but in painting, the tendency to Realism is more excusable, as the artist deals with colour, light, and shade, &c., means which do not exist in sculpture. The author warns his readers against the temptation of colour in sculpture, especially in imitation of the flesh, though he does not object to the introduction of slight indications of it to relieve the monotony of marble, as, for example, in borders to draperies to increase emphasis. The necessity and advantage of general education to the sculptor is made the subject of a lecture, and Weekes saw the importance of making the sculptor a thinking man, which he is more likely to become by education. Portraiture forms another discourse, after which we find two thoughtful dissertations on the discourses of Sir Joshua Reynolds, which are justly held to be the "classics of English art literature." Though written a century ago, these "Discourses" contain a practical philosophy in art which no recent treatises have surpassed. Chantrey, Behnes, and Gibson are made the text of the 13th lecture, and our author considers them the leaders of their art. The Early History of Sculpture forms the subject of the remaining lectures. The work is illustrated by eight photographs of statues by the author, beautifully taken from negatives in the possession of Messrs. Negretti and Zambra, and although they have nothing to do with the text, they add much to the value of the volume. The statue of John Hunter, "The Mother's Kiss," the "Bishop of Madras," "Cleopatra," and "Sardanapalus," are all works displaying the purity of conception and ideal power of this sculptor.

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A RECENT VISIT TO RUSSIA.

THE journey from St. Petersburg to Moscow, although the distance is considerable (380 miles), is quickly and comfortably performed. The night train is the one most adopted by travellers, as it performs the journey in fifteen hours, viz., from 7 p.m. to 10 a.m. This is a double line of rails, and, being the most important in the empire, it is constructed in a most durable manner. The principal stations are one-story erections, and of considerable size. These are circular-ended in plan, and the verandah that forms the covering of the platform continues round the building, in which case it forms a spacious covering for the vehicles having business at the station. These buildings are of brick, and to protect them against the frost they are painted red. The same system obtains with the abutments of the railway bridges, some of which, even with this precaution, are terribly dilapidated. The outlines of the country have undergone no change—still the same undulations, and the same cuttings of drift, sand, and boulders. The villages and small towns are more strictly Russian; the houses, invariably of round logs of fir fixed one on the other, and crossed at the corners, are clustered together, and their roofs, covered with reeds, are steeper in their pitch than are those we have previously witnessed. The only erections of note are the churches, built of rubble masonry or brick, and plastered on the face. These are coloured red or stone-colour, and the iron roofs are painted green, as are the domes and spires. The bells are exposed in the towers, where they are rung by ropes fixed to the hammers; the system of ringing bells by swinging is evidently unknown. As we approach towns of importance, large brick works are noticeable; these, with their kilns, are all covered down and roofed-in with wood during the winter season, when the pursuit of brick-making is out of the question. The bricks are all hand-made, and, from the sandy character of the clay and being unsubjected to pressure, they are light and friable in their character. From the large consumption of bricks, especially in Moscow, where other material is practically unknown, there appears to be a fine field for the introduction of our machinery and our improved modes of burning, for the bricks would stand the severity of the climate far better if made under pressure and more highly burnt. Travelling, as we are, in a direct line from St. Petersburg towards Turkey-in-Europe, we notice a great change in the vegetation. The fir, the spruce, and birch become less frequent, and the oak, the alder, the ash, and the lime more conspicuous. Although we are travelling towards the south we do not notice any change of temperature in the winter season. This is owing to the fact of Moscow being wholly inland and away from the influence of the western ocean, which reaches the towns on the Baltic shores and over to St. Petersburg. Moscow is thus in a region of snow and ice, where the temperature, with very rare exceptions, is below freezing-point during the greater half of the year. During the prevalence of strong north winds the temperature falls to a very low point, 30deg. of frost (Reaumur), and even more, at which the otherwise busy streets are cleared, for it is not safe to be exposed to such an atmosphere; we were told that sledgemen and market-women in the streets insensibly freeze to death, birds fall dead on the wing, and that water thrown up in the air falls to the ground as ice. We mention this, for it was such a temperature that overtook Napoleon and his army on their retreat from Moscow in 1812. Our first impression of Moscow, as we glide from the station to the hotel over the brown coating of snow that lies thick in the roadways, is of narrow crooked streets, and groups of two-story houses of a cheap and common type. The splendour of St. Petersburg has faded, and we have descended to the ordinary level of a Continental town, where cleanliness and order are not the first consideration. Our inn (Hotel Billo) was everything that could be desired, except that the apartments, heated by hot air generated in the basement, were stifling if the closing of the grating was not resorted to. The city, of over 600,000 inhabitants, is curious in its plan; the Kremlin, which is another word for a fort, or citadel, is the oldest portion. Round this the town has grown layer after layer; these are well defined by streets, as boulevards, which follow the lines of long-forgotten fortifications.

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* Lectures on Art, delivered at the Royal Academy, by Henry Weekes, R.A., Professor of Sculpture, &c. With Photographs. London: Bickers and Son, Leicester-square.

Bounding the whole are great lines of modern defences, broken only by the principal entrances of the city, and the passage of the father of the city—the river "Moskva." The streets on the one hand radiate from the Kremlin, and, on the other, they follow the old lines of defence, from which it will be seen they are difficult to master by a stranger. In our case, the dread of being lost in such a city on the one hand, and the valuable notes we hoped to obtain on the other, forced upon us the engagement of a guide, a class of people by no means common, for, be it understood that English travellers are rarely seen in this far-famed city.

The plan of the city we have said is that of a great circle with the Kremlin in the centre. The river enters at the south-west, and leaves at the south-east, describing in its course a semicircle. On the north bank, at the apex of this arc, and on elevated ground, stands the Kremlin; this is triangular in plan, one line, which we may call the base, being towards the river. The land sides are enormous walls of brick skirted by dry ditches, to the north-east as they abut upon the bazaars they are levelled up and become the great "red square," partially used for state and trade purposes, and partially occupied by the Cathedral of St. Basil. To the north-west they are planted as public walks; and in these grounds stood the recent Moscow Exhibition, some portion of which, in the form of picturesque wooden buildings labelled "For Sale," still remain. On the south, between the river bank and the walls of the citadel, a pleasant road is formed, and behind the walls, which are studded with strong watch-towers, the storied spires of which with their green painted tiles are highly picturesque, rises the celebrated terrace, on the flat or top of which the buildings of the Kremlin are placed, and from which, looking far and wide over the city with its three hundred churches, capped with gilded domes, the finest city view in the world is obtained. It is not our intention to devote much space to the consideration of the city as separate from the Kremlin or old heart of Russia, as, with the exception of the cathedral above alluded to, it is all the creation of modern times; the whole of it spreading over miles and miles of ground, has sprung from the blackened heap of ruins that marked the national displeasure of the Russian people at the unwelcome visit of Napoleon with his grand army of 450,000 men, in 1812. The fate of the Kremlin did not follow that of the city; its preservation to this day is due to the accident of its being occupied as the headquarters of its conqueror, Napoleon, who, with fearful misgivings for the future, was hedged round by the burning city. The street-plan of the city, we may remark, is suggestive of an earlier date than 1812; but this is accounted for by the fact of the inhabitants being left to themselves in rebuilding after the fire, when they elected to follow the lines of the old streets. We are thus indebted to these Kremlin walls, the line of which measures about one and a half miles, for the preservation of this ancient citadel, which contains within its bounds the old palaces of the kings, the metropolitan, and the mausoleum churches, the arsenal, the courts of justice, the Treasury, an old monastery, and other important buildings.

These encircling walls were erected by John III. about 1490, to put the citadel in a state of better defence, consequent upon the introduction of ordnance, the former walls of stone and the still older of wood giving way to the progress of military engineering. The architect of these works is said to have been an Italian; but the style is more Asiatic than any peculiar to Italy. The bricks, of which they are entirely constructed, are 10in. by 5in. by 2½in., the modern bricks being half an inch shorter, and one-eighth of an inch thicker. The system of bond is difficult to judge of; this, no doubt, arises from the fact of subsequent repairs, but, so far as we could judge, the principle pursued was a course of headers, upon which was placed a course composed of alternate headers and stretchers, and again a course of headers. Taking the south or river line of the wall, we have two angular towers circular in plan, and of considerable height, capped with minarets or spires. In the stretch of wall five other bastions occur; these are square in plan, and roofed in at a high or steep pitch, the line of which is broken by upper stages pierced with openings, which render them watch-towers in the fullest sense of the term. The roof-covering in this case is small red tiles painted green on the face; these, owing to their old and dilapidated state, are charming in their effect. Turning the angle, and pursuing the line of the north-western wall, we are in the pleasant grounds of the old dry moat or ditch, which is crossed by a bridge leading to the entrance in that face. This is flanked by large circular bastions, the brickwork of which, as is the case throughout, is coloured in imitation of stone. Over the arch is the ever-present shrine with its attendant lamp, upon which the eyes of the faithful are ever fixed. The walls, after passing the gateway, are of enormous height and strength, and, from what we saw in similar walls at the city of Smolensk, we should judge them to be 20ft. in thickness, as they support an enormous weight of earth that forms the high level or great terrace of the Kremlin. above these rise in picturesque order the stately buildings of the treasury, the arsenal, and the old palace, which gives us the impression that this side of the great citadel is impregnable. Turning the northern angle, which is marked by a great circular tower, we fall in with the most interesting side of the structure. This is defended by a great curtain wall, in the enclosure of which is the trading part of the city, viz., the great bazaars and stores, with all their addenda of exchanges, churches, and other institutions. This, a much larger inclosure than the Kremlin itself, is known as the "Chinese City." We are told that these Chinese cities are attached to several Russian towns, in the same manner as the "Chinese bazaars" are to the city of Calcutta. They are, to say the least, ancient reflections of the character of the commodities dealt in in these old trading quarters. Pursuing the line of the Kremlin walls, we near a gate of somewhat modern construction—a gate that occupies the site of one partially blown up by orders of Napoleon, one of his last acts before leaving the city. In the centre of this north-eastern face stands the principal entrance, called the "Holy" or "Redeemer's" gate. This is a rectangular construction, projecting from the face of the wall, above which rises a tower and spire of tasteless architecture. This, in its lower part, is said to be the work of Peter Salarius, a Milanese, in 1491, and in the upper part of Christopher Galloway, an English clockmaker, who placed a clock therein in 1626. The interior of the tunnel-like archway, that pierces this structure, is rudely decorated with conventional ornament, treated in every conceivable colour on a ground of buff. This gate is remarkable for the shrine or picture placed over the archway, a picture that is held to be endowed with the power of working miracles, and one before which every male person, year in and year out, be he of what nationality he may, uncovers in reverence to the same, or out of respect to the national custom, and before which every female makes lowly obedience. It is one of the most interesting sights in Russia to stand near this holy gate of the Kremlin, and watch the multitude of busy people passing in and about this portal, no solitary member of which fails to pay the time-honoured tribute of reverence to this sainted shrine. Near this gate stands the truly Russian cathedral of St. Basil, and opposite the same is the place of public execution. We are reminded of this by a quaint-looking pagoda on the Kremlin walls, in which, it is said, "Ivan the Terrible" was wont to sit and witness the execution of his subjects, after their being condemned to death. On either side of this celebrated gateway, as, indeed, is the case with most of the gateways in the walls of the Kremlin and the Chinese city, are native chapels, in which the old custom of worshippers entering and making their burnt offerings in the form of purchasing and fixing lighted tapers before the shrines is actively pursued.

Of the general architecture of these Kremlin walls, which, on the whole, are very quaint and picturesque, we offer the remark, that the details of this work are familiar to us in the designs of our architects; we trace them more especially in battlements, parapets, and corbels, a case in point being the water-tower at Grimsby, which, for its grace of outline and its charming details, is justly admired; but which, nevertheless, is borrowed from the Kremlin walls, or some parallel source.

(*To be continued.*)

HOUSEBUILDING IN SPAIN.

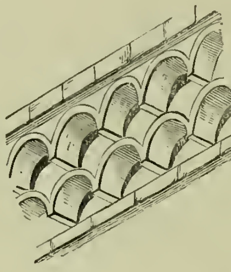
SPAIN, for many past years a land of legends and travellers' marvels, is losing, now, that artificial aspect; and, to the rest of the civilised world, is appearing in a truer light of history and description. The readers of the Building News have already at hand more than one good account of the country and its architectural adornments. I purpose making, therefore, only a few notes; not of poetical impressions, but of everyday things, of ordinary Spanish housebuilding in use at the present day. Of course, some of these methods and materials are already known and utilised in England and other countries, but they are not common enough, I believe, to be uninteresting.

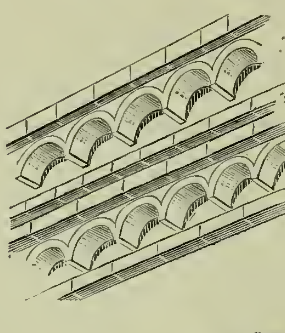
For the next ten years, Spain ought, then, to receive diligent attention from English painters and students. To the architect, perhaps, Spain cannot offer quite so much. There is a wealth of antiquity, and picturesque age. But purity, and the first principles of architectural art, were almost forgotten here when Gothic art declined. The Gothic architecture Mr. Street has made tolerably familiar to us, and Sir Digby Wyatt's book gives some examples of the Renaissance. There is in Spain an abundance of misshapen abortions, with so-called Italian detail; and, here and there, may be found a tomb or a doorway of a delicacy and refinement not to be surpassed. And there are marvels of elaborate decoration in late styles; but I don't think Spain is a country in which to study Renaissance architecture. But, in the north, Gothic, and in in the south, Mooresque, architectural remains are many and instructive. And, comparatively, they are fresh.

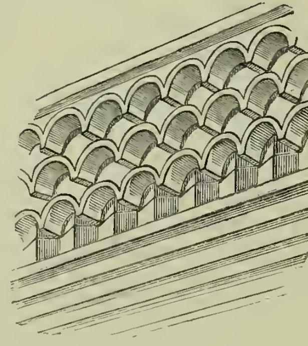
I have written all this, not from a desire to record my impressions, but with an earnest wish to attract more attention to the richness of this new field for study. Spain is being neglected by Englishmen: it is as a volume unread. I hope my fragment of protest may have some slight influence upon the flood of novelty-seeking Britons, who are crowding to hackneyed resorts, and neglecting this store of freshness.

Now to my more immediate subject. This is a land of cheap labour and materials, and antique methods and tools. It is strange to see such things as the lathes upon which men turn their domestic woodwork (by means of a bow and string upon the article itself) being used in the nineteenth century in civilised Europe. But there are many "rough-and-ready" modes of construction and ornament which are worth notice, and might be remembered with advantage sometimes in out-of-the-way provinces, even in England. The varied and effective cornices, for instance, formed of brick, in combination with the hollow roofing tiles, are good and cheap, and can be made by the most uneducated bricklayer. The tiles I refer to are the almost-universal Spanish roof covering. They are manufactured in a primitive manner thus: A table is served with roughly-tempered clay; the workman has a light, four-sided frame, about 12in. by 10in. narrower at one end, to allow for the diminishing of the finished tile. A lump of clay is laid upon the table, within this mould, and levelled in it with a straight-edge. Then the soft tile is lifted upon a curved block, and an assistant carries it away, places it on the ground, draws out the block by the big end, and leaves the tile standing, archlike, in the sun to dry; then it is burnt in a primitive kiln. The curvature of these tiles is nearly a quadrant.

Bricks, which are generally about 10in. by 5in. by 1½in., are sometimes made in moulds, as are the tiles. Now, with these two materials, and liberally-used mortar, the Spanish cottage builder crowns his wall with a really good cornice, which is not exactly like his next door neighbour's, nor yet a fantastic attempt at originality. I give sketches of three varieties of these cornices.







The use of the thin brick, too, allows of better effect in strings and surface relief than we can obtain with plain bricks; and I must add my testimony in favour of the appearance of the thick mortar joint, still prevalent here. The rough varied surface is far more agreeable than that of a dead flat English brick wall. Even in large monumental buildings it has not the cheap or crude effect which is probably what an Englishman fears. As for its resistance to weather, the winter is, in some parts of Spain, more severe, and nearly as humid as is usual in England; and these walls seem to stand it well enough.

In modern building one finds the walls being constructed in the extremes of solidity and flimsiness, sometimes in masses of solid stone and brickwork, and at others in three or four or more superimposed stories of brick nogging even for party and external walls. But I notice that the framing of this is carefully secured, and that every post is fitted with short pieces by way of cap and base, strengthening the post and head and sill at the same time. Some of these enclosures, carrying heavy floors and roofs, are curious examples of what, with careful attention to certain points, timber can be made to do.

Floors are nearly always tiled, even upon the upper floors. They are constructed of rough, sometimes unsquared, timbers laid about 1ft. 6in. apart, and with rough arches of pieces of brick or stone between them, upon this a thin levelling of concrete, and then the tiles—plastered below on laths as usual. This is a floor very suitable for cottages in rural districts; almost any timber can be used with very little preparation or skilled labour — and its fire-resisting properties are very considerable. If wrought timber is used the lathing is generally omitted, and the undersides of arches are plastered between the joists. I like this ceiling very much; sometimes a few lines of colour decoration make quite a feature of it.

In roofs, too, otherwise useless timber is made to serve by rough lathing and bedding the tiles (altogether without nails) upon an ample quantity of mortar; and the roof is so firm that when necessary people walk upon the tiles without disturbing them. And, of course, it lasts for generations.

Joinery, as might be expected, is rather rough; but it is solid and genuine, and effective. This last very much, because of the use of thick framing in small panels, with a very simple moulding, or even quite square. I have seen doors and shutters simply divided up into square panels of from 6in. to 12in. side, which looked far more effective than many modern English overstrained attempts at decorative framing. In more complicated work, some of the older doors to churches, &c., with a richness rivalling the more ancient Moorish joinery, are very fine models. The windows to houses are generally casements differently contrived in different provinces—generally heavy, and with shutters hung inside upon the sash itself. Lifting sashes are unknown.

The frequent use of glazed and painted tiles for dadoes and wall-linings is worthy of note, and the tiles are all hand-painted; sometimes in a manner and with colours not to be despised. The household pottery (nearly related to these) is beautiful. As the town water supplies are nearly all street fountains and natural streams, the pitcher, of unglazed red earthenware, in which it is carried and stored, is an everyday necessity. The forms are mostly very good, often superb, and there is a considerable variety. But already one sees occasionally a vessel of tin, ugly and hot. It would be worth while making a large collection of these beautiful pitchers and other smaller jugs and bowls, before they are replaced by the tin water-cans and wretched crockery of civilisation.

Although Spanish national art has been unfortunate, and has not figured very prominently, I think that there is a considerable artistic feeling in the race. Among the degenerate ill-led styles of decoration, one sees often evidence of it in some delicately designed bit of fresh-looking work. And there is a scope for decorative art which, if the vagaries of the Renaissance age had not led the present into such mistaken styles, would result well. Wall-papering, for instance, is almost unknown. Hand-painted walls and ceilings are more common, and some of them, upon a system of dividing up the surface into panels with lines of stencilled and free-hand ornament and a simple centrepiece, are very satisfactory. The most prevalent fault is the representation of relief, mouldings and sinkings with shadows being painted on the flat stucco. And this is largely done upon exterior façades. Perhaps at Toledo it is as common as anywhere. A perfectly flat front is scene-painted and shadowed to represent orders and cornices, architraves and arches, with a patience and at an expense which would have provided a really good decoration. And not only upon houses, but upon large public buildings, is this foolish "adornment" done.

In these cities of balconies, the smith is an important tradesman, and, with the cheap labour and little-valued time, common houses often get provided with wrought-iron work of genuine, simple design, for these balcony fronts, which would be a luxury in London. Bolts, bars, and latches are primitive, and ponderous or fragile, according to the builder's whim. It is, in some parts, no uncommon thing for a general smith to make a lock, from beginning to end. Some are artistic; but, as a rule, there is not much to be learnt from them.

As a rule, Spanish cities are not building very actively. Madrid, of course, shows some tendency to grow and improve itself. But although the capital is far in advance of the rest of the country, building seems to carried on in much the same manner. Party walls of brick nogging are carried up apparently unlimited heights. External walls are generally tolerably massive, and ironmongery is better. The joinery is better in execution; but large panels and weak mouldings spoil it. The later façades are generally French in character; some very agreeable.

Salamanca, Zamora, Leon, Avila, and other cities of the interior, are all nearly stationary as to housebuilding. At the two former, one or two public buildings are in progress. As a rule, they are designed in a French spirit. But Salamanca, once so prosperous, has not vitality enough even to remove the ruins left by the French invaders. There are considerable spaces still strewn with débris, and deserted as worthless.

Valladolid and Zaragoza show more activity. At Valladolid, new market-places of iron and glass are being erected upon the "plazas," to replace the more picturesque, but less useful, umbrella-tents of picturesque and dilapidated coloured canvas. These buildings seem to be copied from what more northern nations have found appropriate; but I did not notice any particular modification to resist the intense summer heat of the country. When they are completed, I fancy the people will long for the airy shade of their old freely-ventilated tents.

Zaragoza has improved itself pretty well. Upon the fine, broad, new "paseo," housebuilding is still going on.

Toledo is doing very little. The new approaches even do not seem to make much difference to the building trades. This city and Cordova are somewhat similar in their old-world antiquity, which seems to repel modern innovations. There is a new broad avenue, or "paseo," at Cordova, which seems not to belong to the town.

Granada, too, makes little progress. There is some work going on in connection with the covering in of the river Darro, which has become little better than an open sewer, along the main street. Here light wooden construction is very prevalent. The Andalusian cities of Seville and Cadiz are, of course, more favourably situated than those yet mentioned for intercourse with the world. Consequently, they are much modernised, and are now carrying on their improvements. But Catalonia, with its capital city, Barcelona, must be allowed the first place for progress. Here building is carried on with an activity quite English, and the city is growing out towards its suburbs at great speed, while public works (which I hope to speak of further) are considerable and many.
—R. W. Gibson.

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TRURO CATHEDRAL.

THE works at this place in connection with the new Cathedral are going on steadily, and, under the excellent management of Mr. James Bubb, the clerk of the works, the staff of men employed by him are making visible progress. All the staging, &c., used at the late Royal ceremony has been removed, and sold by auction. The foundations are being now got out for the new Cathedral, and the footings are being put in at the east end of choir. They rest upon the solid rock beneath (Shillet). A wooden church, to hold 400 or 500, is at once to be built on the north-east site, but, in such a compass, of course, as not to interfere with any part of the footings. Hence, the choir, as originally intended, will be completed without any interference with this temporary structure. The wooden church will probably take two months to erect. Once up, the Church of St. Mary—all but the ornate south aisle in chancel—will come down immediately. The work of destruction includes the spire, which is also doomed, and which, it is possible, Mr. Sedding, or some other lover of Cornish spires, may like to buy. Any reasonable offer will gladly be accepted. All the stones of the old church will be worked up in the new Cathedral. When the rest of the church is down, the work of rendering perpendicular the south wall will be commenced. It is, at present, 8in. out of the upright. It is built of a soft Elvin stone, and, being all face bedded, time has not dealt kindly with richly-moulded and particularly ornate carved work, all of which is much decayed. The foundation-stone measures 3ft. 8in. by 2ft. 1in. by 11in., and is made of Mabe granite, a grey variety procured near Penryn. It forms the course above the plinth of the north-east angle buttress. The memorial-stone, also laid by the Prince of Wales, is, in reality, one of the pier-stones in the south arcade, where the third pier east from the western respond in that arcade will occur; the base, and one course, was put in prior to the ceremony, in St. Dennis granite. Upon this another course, in the same material, was fixed by the Prince, and, since then, yet another one has been added, so that the column stands isolated—as Lot's wife must have done after being converted into salt—some ten feet, or more, above ground, and all by itself, at the western end.

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"BUILDING NEWS" DESIGNING CLUB.

REVIEW OF DESIGNS—A GAMEKEEPER'S COTTAGE.

THE designs we have received for this subject are generally creditable to their authors, and we are happy to record a marked improvement in the work of many of our members. A gamekeeper's cottage should be economical in plan, and characteristic in external design; it should not look like a villa, but ought to present a modest relation to the other buildings of the estate. "Alfred's" design appears to meet these requirements better than any other. The plan is compact—nearly square; there is a well-disposed centre hall, with gun-room on one side, easy of access to the sportsmen, and so placed as not to destroy the privacy of the gamekeeper's private rooms. The stairs are well placed and lighted, and the kitchen and offices are out of sight. Economy has been obtained by combining the flues and drawing them up together in the centre of roof, thus making also a pleasing feature. The upper story is constructed of timber-framing and plaster, and the gable above entrance is bracketed over, giving a pleasing relief. The upper plan is compact, and the drawing of elevation carefully finished. We should liked to have seen a roof-plan, if only a sketch, to show the roofing over kitchen, &c. "Sub Silentio" is also a very pleasing grouping, though more costly in character; the arrangement is very similar to the last, the stairs and gun-rooms are disposed in the same manner, but we do not like so well the scullery and larder arrangement, which are roofed within the main slope of gable; the roofing, also, is rather too cut-up, and the chimneys are not so well stacked. The bedrooms are convenient and large, and the elevations and sketch show a thorough feeling for the Old English style of the 17th century, and avoid redundance in detail. As in the last, there is a timber-framed gable over the entrance, with a coved projection, and the upper story is framed and filled in with parget; there is a pleasing double-gable front, the lower walls being of brick. "Edwin" sends, as usual, a spirited sketch of a simply-grouped cottage, tiled in the upper story and roof, with bright red-brick walls below. The entrance is wide, and made a central recess with a seat on one side, and is very picturesque and home-like. We think the gun-room, 12ft. by 8ft., at the back of parlour, is rather inconvenient, though we see the kitchen and living-room are placed on the other side, having a separate door of intercommunication between, so that the private apartments are together. The offices, too, are all self-contained, and the bedroom arrangement fairly disposed. The elevation and details are plain, and effectively treated in a homely, rural style. "Ap Adam" is generally compact. The parlour is opposite to gun-room, and both are near the entrance, and the private rooms are well kept apart. The design is in a good Gothic brick-and-timber style, and well drawn. "Castello" is another design of merit. We see little to find fault with in the arrangement, though the gun-room is small. The parlour, or luncheon-room, on the other side of vestibule, is a good feature, and could be serviceably used on sporting days. The private part of house is separated, and the offices convenient and in communication with the living-room. The bedrooms are well planned. The elevation in a plain Domestic Gothic style is sensibly treated, the upper story is partly tiled and partly of timber, and the detail is creditable. The entrance-porch is a good feature. The drawings are clearly executed, and the author has taken care to figure dimensions. The cubical contents are worked out at 8d. per foot, £760. "Merlin." This design is neatly drawn, and is in a suitable style, but the glazed porch to the entrance is unnecessary for a gamekeeper's cottage. The positions of stairs in front of hall and the parlour-door are not the best chosen, and the plan is spoilt by the arrangement of kitchen and living-room doors, which destroy all privacy in the house. The outer offices contain four dog-kennels. The side elevation is more pleasing than the front, the centre gable over w.c. in the latter destroys all unity, and is rather too obtrusive. "Sub Rosa" sends a pleasing sketch, but it has a stilted appearance, and partakes too much of a villa, for which it would admirably do. The entrance and gun-room at the side of house is inconvenient and small, and the roofing, with centre valley, undesirable. The cost is estimated at £350. "Pupil J." is picturesque and cottage-like, but somewhat incoherent and jumbled. The plan is compact but rather devoid of method. It would be quaint. The entrance, gun-room, and parlour are conveniently related, and the stairs are planned to ascend round the living-room chimney, which becomes a kind of newel. The design possesses the merit of concentration in plan, and a little more care in the detail would have given it a title to a higher rank. "North" makes a pleasing cottage, and is simply grouped. There is a good open porch, which leads to a narrow lobby and stairs, but the gun-room, instead of being near, is made a lean-to, disconnected with, though attached to the house, having an outer door directly opening into it. It is true there is a communication by a door between parlour and gun-room, but the plan is inconvenient and uneconomical. "Our Praises are our Wages" is simple and effective in the sketch. The gun-room, 6ft. 3in. by 5ft. 6in., is small, and we think the living-room door is too close to the entrance, which is placed at the side of the house. The drawings are neat, and the style suitable on the whole. One objection is the double roof and valley between, always expensive, and undesirable where it can be avoided. "Howard," a well-drawn elevation, suitably treated in brick and timber framing, Gothic in style, but the plan is too capricious to entertain; we need only remark upon the awkward position of gun-room in the middle of house, near the kitchen and staircase, and the small canted lobby giving access to it. There can be no comfort in such an arrangement. "Mot's" design is rather villa-like: it is treated in a more monumental Gothic style than many have attempted; the corner staircase forms a turret, and the whole is built with stone externally, and a brick lining inside, with 3in. cavity. The arrangement is compact, though the stairs might have been placed elsewhere, and nearer the private rooms. In a stone district the design would be suitable. "Clansman" is cottage-like, and suitably treated in elevation. There is a large corner porch leading to a parlour, a gun-room behind 10ft. 6in. by 8ft., having a closet for dog-food under the stairs, and a living-room on the opposite side. The planning is too ingenious, and looks rather involved; the living-room door is not in a good place, and the gun-room would have been better where the parlour is. The kennel and game larder are good points. The stair landing window is awkwardly squeezed in the corner, over the porch. "Never Too Late to Mend" might have been better, in spite of crudeness and want of finish; the passages and gun-room are wasteful. "Jack" in circle is a neatly-drawn elevation in a species of Gothic, half-timbered above; but the planning is spoilt by a wide wasteful centre passage through house, and the cramped and awkward position of gun-room next to the larder, its door facing the kitchen; surely the author has not given a gamekeeper's cottage the thought it needed. "Burswell's" design is better in plan, albeit the corner porch looks cramped, and the stairs would have been better placed elsewhere. The external treatment is suitable and inexpensive. The author prices at 6d. a foot = £673 12s. "Hubert" is a neat Gothic design, the principal feature in which is the open corner porch, made by carrying a bedroom on posts to protect entrance—certainly a consideration in wet weather, though hardly a justifiable manner of providing shelter. The author seems to think, evidently with some, that the gun-room is an ugly necessity, better relegated to the precincts of the out-offices, and accordingly it is placed next the earth-closet and close to the living-room door. Other inconsistencies appear. "Haaber Jeg" has not sufficiently worked out the details of his plan: the gun-room is in a good place, but the pantry is too long. The general design has merit, though it is rather school-like. The design by "Ernest" savours too much of a suburban villa: the entrance passage is long and wasteful, and the private rooms are not well kept together. In carrying the dinner, the service would be directly across the gun-room door, and close to entrance. "Toledo" is conceived in a suitable brick-and-timber style, and the plan is compact, but the entrance looks cramped. "Attempt" is far too ambitious; we might easily mistake it for a gentleman's villa: the hall, 12ft. square, with stairs, is too large, and the doors of kitchen and gun-room are placed close together—a fatal mistake, which a little thought would have avoided. "Mustapha" has a sensible plan in the main, though the gun-room is placed behind the parlour; the elevations show brick-and-timber framed upper stories in Domestic Gothic, appropriate in character, but a little expensive in the roofing. "Factable," a neatly-drawn set, but a trifle mechanical; plan sensible in arrangement, but villa-like. "Excelsior" falls into the same error; the hall is over-large, and the plan costly, but the elevation is drawn in a suitable style. "X. L.," "Ivanhoe," "Dewe's," and "Gemshorn" have all given us more of small villas than gamekeepers' cottages, and some of them have exceeded the bounds of discretion as to ornament. One shows the gun-room leading from the kitchen, another makes it a large room vying with the parlour. "Palmam qui meruit ferat" puts himself out of the contest by sending a tracing; the design would make a decent villa, but we can hardly call it suited to the purpose, either in plan or elevation. On the whole, the drawings show a decided improvement, and there are fewer designs marked by coarse or crude detail.

A SUMMER-HOUSE.

ONLY three designs have been sent in competition for this subject. We place "Edwin" first, inasmuch as he has seized the idea of a semi-rustic erection of brick and oak, that is neither ridiculously fanciful nor too ornamental. It is a simple octagon, with a conical roof of shingle, and has three flat bracketed bay-windows, with a circular seat. Its diameter inside is 8ft. 6in. The external walls are timber framing filled in with upright oak, and the plinth is of brick. "Sub Silentio" is more finished, and certainly pleasing in style. It has three open sides in the octagon, the centre one being the entrance, with a scalloped shell pediment over running into a conical roof. The open railwork to the two sides are treated in a Japanese spirit. A pale chocolate for the outside, and a light blue grey for the interior are suggested. "Alfred" sends a clever sketch, rather more rustic than either of the former. The plan is an elongated octagon, with three projecting bays on brackets to each of the ends—each window, in fact, springing out of a side of the lower framing. The roof is of thatch, and the style is Late Gothic.

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ARTISTS' COLOURS.[*]

MR. MUCKLEY'S own practical experience has been well turned to account in the preparation of this practical and well-arranged manual. Recent discussion has made manifest what many people knew before, viz., that artists generally have acquired but a small amount of knowledge of the chemistry of colours, their relations to each other, or the vehicles necessary to convey them to canvas. The result is the rapid change and deterioration of pictures, to the disappointment both of painter and patron. The following extract is an example of the equal readiness with which Mr. Muckley detects some of the causes which have produced the deterioration of artists' colours, and suggests a remedy:—

"Of late years there has been great competition in the prices of colours, oils, and varnishes, and even the best colourmen have felt it necessary to keep pace with it. This has induced quicker methods of preparation, as well as more extensive adulteration.

"If a thoroughly careful and conscientious course were to be observed, it would be of the greatest advantage to art. Let some colourman begin anew, by taking special care that all the materials which come into his hands are pure, and that the washing and grinding of certain pigments be as perfect as possible. Let him also supply only those colours which he knows to be of the best quality and permanent. Or if he chooses to sell those which are only semi-permanent, let this be indicated on the usual label attached to the tube or cake, so that painters may be made aware with what they have to deal. The price of such materials might be raised according to the extra time and care given to their preparation. There can be no doubt that any colourman who would take the matter up in this form, would soon have the best part of the business to himself, for at the present time no such person exists. The formation of a body or society for the preparation of painters' materials, under the immediate control and direction of painters of repute, would doubtless be still better.

"Cheapness, or rather low price, should be the last thing an artist ought to think of in relation to the cost of his materials. There is no kind of manufacture more deserving of consideration than that of making painters' materials, and more especially that relating to pigments. This is at once evident, if we realise that from a few tubes of colour, of small comparative cost, a work of the value of hundreds, and sometimes thousands of pounds, is often produced. When it is considered that the permanent or fugitive character of such works is to so great an extent in the hands of colourmen, their responsibility is certainly very great.

"In order to ascertain if colours change, and how soon such changes may take place, the painter should try experiments for himself. Let certain pigments be taken, both mixed and unmixed, and matched with such objects as may be in his possession of permanent colours, as glass, enamel, porcelain, &c. These colours or compound hues might be put upon the things referred to. After they have been allowed to remain upon them for a few weeks, any change that may have occurred will be easily seen. In some cases the painter will be astonished at the rapidity and extent of the alteration in these trial colours, and by this experiment he will be able to ascertain very distinctly what colours to employ, and what to avoid. A pigment, when well prepared, may be quite permanent; but careless preparation, adulteration, or insufficient washing, will not only render it fugitive, but damaging to all other colours which come in contact with it. Take zinc white, which has been either imperfectly made or adulterated, as an example of instability, but which is permanent when properly made. This pigment is often so badly manufactured, that when employed at all thinly, it flies away in a few weeks. This may be seen by covering over with it a chequered or figured surface of light and dark colours, or dark grey and white, making the darker parts almost invisible with the zinc white. In a little time these marks will begin to reappear, through the white, and in the space of a month or two, they will be nearly as visible as though nothing had been put upon them. Should suspicion be entertained of the permanence of a colour, experiments ought to be made with it at once, in order to ascertain if the doubt be well founded. A number of tints with the suspected colour and flake white should be mixed. It should also be compounded with other colours, which in the painter's opinion have been, or are likely to be, affected by it. Patches of these tints and hues might then be put on a piece of millboard or canvas, and hung in different situations, more or less likely to affect colours of any description. Of course each patch or trial of colour should be numbered, and the same entered in a memorandum book; corresponding with such number, the colours which may have been employed to form the tint or hue, should be named, as well as the vehicle which was mixed with them, with any remark that the painter might have felt necessary to make at the time. If this kind of experiment were to be followed up for a few years by various painters, and at the end of that time they compared notes with each other, most valuable information would be obtained; and being put on record, it would be of the utmost importance to the painter and his art.

"The painter should always make an effort to use as few colours as possible, and they should be of the most permanent kind. The use of a limited palette with the old masters was a necessity, and this explains, to a great extent, the good condition of many of their works at the present time. It must not be forgotten that many colourmen manufacture their goods to sell, and almost irrespective of their final use in the production of costly works of art. The most fugitive colours may be obtained from them, as well as the most durable, and the painter who is uninformed as to the nature of colours, generally employs them all indiscriminately, and of course, to the detriment of his work."

* * *

SPIRIT FRESCO PAINTING.

MR. T. GAMBIER PARRY'S account of this process, published at the desire of the Lords of the Committee of Council on Education, for the use of students in schools of art, is an important contribution. Lately, much attention has been called to the process of spirit fresco painting, as practised by Mr. Gambier Parry, in consequence of its adoption by Sir Frederick Leighton, P.R.A., in his great mural painting, "The Arts of War," at the South Kensington Museum. We shall here content ourselves with a summary of the paper of Mr. Parry. He claims the following advantages for the process: (1) Durability (the principal materials being all but imperishable); (2) power to resist external damp and changes of temperature; (3), luminous effect; (4) a dead surface; (5) freedom from all chemical action on colours. In speaking of the wall surface to be painted, he says it must be perfectly dry and porous, that the best surface is good common stucco precisely the same as that used for Buon fresco, viz., two parts of thoroughly slaked lime and three of perfectly washed gritty sand; but for ordinary work, the common plaster (stucco) in the interior of buildings carefully executed may be trusted. Its natural porous surface is very essential, and all "floating" destroys this quality. Cements are to be avoided, being too hard and smooth. After a good stucco wall, that of a coarse and porous Bathstone is preferred, or any other porous freestone; all sand-papering to be avoided from its filling the pores of the stone. We quote in full the instructions on the medium and preparation of colours. "Take in any multiple of these proportions according to quantity required for a work:—

Elemi resin (gum elemi)	2oz.	Weight.
Pure white wax	4oz.	
Oil of spike lavender	8oz.	Liquid measure.
Finest preparation of artist's copal	20oz.	

If a stronger kind of copal is used, 18oz. are sufficient. With these materials, incorporated by heat, all colours in dry powder must be mixed, and the most convenient system is to do so precisely, as all colours are mixed on a slab, and put into tubes. The colours keep in this way for many years; I have many in tubes above 20 years old. The proper method of compounding this medium is this: Two pots (one small, one large), a long spoon, and a charcoal stove are required. Take 2oz. of Elemi resin and melt them in 2oz. of rectified turpentine in the small pot or saucepan over the charcoal, and strain when quite liquid through muslin (to clear it of pieces of leaves and bark) into the larger pot. This is most conveniently of copper. The one I use is 6in. across and 18in. high, with a flange near the bottom to make it stand securely on the charcoal. Into this put 4oz. of white wax in small pieces, and melt with the elemi. When melted add 20oz. of copal, and boil all together to a white foam, stirring well with a spoon reaching to the bottom, remove from the fire, and boil again. Immediately before the last removal from the fire add 8oz. of spike-oil. This volatile ingredient would be wasted if added sooner and boiled. N.B.—It is necessary to be extremely careful lest any spark from the charcoal (no flame being allowed) should ignite the liquid, every ingredient being inflammable. It should be done out-of-doors. Decant through funnel into *clear glass* bottles, so that the condition of the medium may be visible before use, the quart size being most convenient, and leave uncorked to cool." In preparing the wall-surface dry and warm weather is recommended. The medium is to be diluted in *once* and a *half* its bulk of good turpentine, the mixture being better when compounded by heat in a large iron cauldron over flameless charcoal. This wall-wash may be kept for any time in bottles. The wall is to be well saturated with the solution, the liquid being dashed against rather than merely washed over it.

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[*] A Handbook for Painters and Art Students on the Use of Colours, &c. By WM. J. MUCKLEY. London: Baillière, Tindall, and Cox.

Repeat after two days, leave it a few days to evaporate, then mix equal quantities of pure white-lead (in powder) and of gilders' whiting, in the medium slightly diluted with about a third of turpentine, and paint surface thickly, and when evaporated, add another very thick coat. This, when dry (in 2 or 3 weeks), produces a perfect surface, so white that colours upon it have the luminous effect of Buon fresco, with transparency of water-colour." As regards painting, Mr. Parry says, "Paint boldly and simply as in Buon fresco, as much as possible *alla prima*, and with much body, and use pure oil of spike in your dipper freely." Decision is necessary to avoid disintegration of material. Solid painting is preferred. The rationale of the process is described. The colours in powder are incorporated with material identical with that which has been sunk into the pores of the wall surface, and has hardened there by the evaporation of the turpentine vehicle. The colours, therefore, may be regarded as belonging to the wall itself, and not merely superficial. This result is produced by the spike oil being the common solvent of all the materials, which turpentine is not; the painter's brush, when it touches the surface, opens it to receive the colours, and the rapid evaporation of the spike oil closes them in. Some cautions are given, as cleanliness in working, &c., into which we cannot enter. Mr. Parry alludes to his own paintings, executed over the chancel-arch of Highnam Church 21 years ago, and another work in St. Andrew's chapel in Gloucester Cathedral, finished in 1867, as examples of the durability of the process. We recommend all students of the art to a process likely to overcome the objections to other systems, due to the darkness and dampness of the climate.

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THE NEW KINGSTOWN TOWN-HALL.

THE new Town-hall, at Kingstown, opened on Tuesday, contains municipal offices, a fine public hall, and a commodious courthouse, where the county chairman will sit periodically, together with accommodation for the holding of the police-court. So long ago as 1866 the Town Commissioners, feeling the want of such accommodation as that which the new building provides, advertised for plans and specifications, but the difficulties which were thrown in the way of procuring a suitable site caused the scheme to lapse for a time. In 1874 it was revived, and in August of that year, the difficulties with regard to the site having been obviated, the plans sent in by Mr. J. Robinson, 198, Great Brunswick-street, Dublin, were selected, and tenders advertised for. The amount of the contracts and extras was nearly £14,000, but it is estimated that the entire building when furnished will cost at least £16,000. The architecture is after the Italian style. The main frontage is on the Royal Marine road, where the façade measures 130ft. The main entrance is situate in the centre of this front. Passing through the massive doorway, the hall, 16ft. wide by 22ft. long, is reached. The bottom story, 16ft. 2in. high, contains the courthouse, which is 39ft. by 30ft., with rooms for witnesses, barristers' room, clerk of the peace's offices, the jury-room, the judges' retiring room, closets, lavatory, &c. On the left-hand side of the main entrance, on the same story, are offices for the town clerk, the town surveyor, the rate collector, and the sanitary inspector. The next story is 22ft. high. It is approached by a grand staircase, and contains the assembly-room, a fine lofty apartment, 76ft. 6in. long by 41ft. 6in. wide, moulded roof and cornices. The interior fittings of the assembly room will consist of a platform of pitch-pine and American walnut for the accommodation of performers. The boardroom, in which the town commissioners will hold their meetings, is also situated on the second story. Its size is 30ft. by 39ft. The walls are covered to a height of 6ft. with a panelling of pitch-pine and American walnut, richly moulded. The furniture of the boardroom has been designed by the architect, and will be of massive oak in keeping with the rest of the building. The assembly-room will be devoted to public meetings, concerts, and entertainments. The second story will contain, in addition to the rooms mentioned, the town clerk's office, a commissioners' retiring-room, and some clerks' apartments. The height of the building is 50ft. from the floor balustrade. A tower 120ft. high surmounts the courthouse entrance in Crofton-road, in which there will be a clock situated at a height of 80ft. above the ground. The windows of the building are circular-headed, and those of the principal stories are constructed with nook shafts in angles, with carved capitals, moulded arches, and hood-moulds. Polished Aberdeen columns ornament the windows over the main entrance in the Royal Marine-road and the boardroom windows. The building will be capped by a cornice, supported by granite brackets, with a pierced parapet over the roof, high-pitched, covered with slates in bands, and decorated with metal cresting. The materials used in the construction of the building were local chiselled granite ashlar for the main walls, with Bath stone cornices and arches. Various descriptions of stone have been introduced by the architect where their colour serves to emphasise the leading lines in the architecture. It is now nearly two years in progress, and during that time the contract has been carried on by Messrs. Meade and Son, Great Brunswick-street, in a way to give general satisfaction. The foundation-stone was laid in the month of November, 1877. We illustrated the Crofton-road front of the town-hall, from Mr. Robinson's drawing, on April 4, 1879.

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EXAMPLES OF ART METALWORK.

MESSRS. HART, SON, PEARD, and Co., of Wych-street and Regent-street, have sent us a new edition of their illustrated catalogue. It is divided into six sections. Section I. treats of cast-iron work, and includes designs for ridge-crestings, terminals, balcony and tomb railings, street-railings, gratings, hinge-fronts, balusters, lamp-pillars, R. W. pipe-heads, &c. In the margin of each sheet, the dimensions and price of each article are given. Many of the patterns show a due regard to the functions of cast-iron design, and a large variety of patterns are given. Section II. similarly contains designs for railings, bell-cots, chancel-screens, gable-crosses, gates, grilles, ridge-crestings, &c., in wrought iron, so that the architect may select that kind of manufacture most suited for his purpose. Some of the gates, grilles, screens, &c., are in good taste, and exhibit the advantages of wrought iron. Section III. is devoted to Mediæval ironmongery, in which will be found every article necessary for the furnishing of churches and houses, each variety being carefully priced. Fittings for lighting is another section, and includes every requisite, from candle-brackets to lamp-posts and lanterns. Some of the gaseliers of polished brass are exceedingly chaste in design; Nos. 625, 630, 540, 42, are excellent in form and finish, and in many of the other classes we find correct principles have actuated the designer.

Section V. includes church furniture, from alms-boxes to altar-crosses. Lecterns of wood and brass, desks, and pulpits are to be found here in every kind of Mediæval style, from rigorous severity to florid detail. The last section contains domestic furniture, a very large class. We see some very good basket and pillar grates, with firebrick body, varying in price from 15s. to £7; also dog-grates, in Gothic and Renaissance styles, and a large collection of register-stoves, with tile borders, in a variety of patterns, from Early Gothic to Queen Anne. To facilitate reference to the various articles illustrated in the catalogue, an alphabetical index is given at the end, by which much hunting will be saved. Altogether, the catalogue contains 226 pages of closely-printed examples, each article being priced in the margin and amply described, so that the architect need only to quote the number or description. It will be found of service to the profession, as a guide to prices; and the builder and ironmonger would be incompletely stocked with necessary trade catalogues without this one.

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE special meeting convened for Monday evening to authorise the sale of £2,300 Three per Cent. Consols, for the purpose of discharging the remaining liabilities in respect to the recent premises alteration, and of reimbursing to the ordinary funds a portion of the advances made therefrom, passed off very tamely. The President, Mr. John Whichcord, took the chair at 8.30, and amongst the five-and-twenty or thirty members present were Professor Hayter Lewis, and Messrs. Cates, Ewan Christian, Hansard, Robins, Edis, Robson, C. Fowler, Papworth, T. R. Smith, Currey, Jennings, Bowes Paice, and Brandon.

Mr. A. Cates read the report of the building committee, showing how the money was spent, and stated that the subscriptions received had been insufficient to meet the requirements, while ample powers were given to the Council by the resolutions passed by the members. The Secretary read a list of additional donations, amounting in all to £32 6s., from members, and several questions were put by Messrs. Currey, Jennings, Edis, Roger Smith, Wyatt Papworth, Robson, and Fowler, and were answered by the President, the only point of interest in his replies being that the Council anticipated that the sum now withdrawn from capital would be refunded within the next two years by the entrance-fees and subscriptions of new members. After a discussion of a conversational character, in which objections were expressed, not to the vote itself, but to the want of business-like action in the entire proceedings, the resolution authorising the sale of stock was put from the chair, and passed unanimously.

ARRANGEMENTS FOR NEXT SESSION.

The Council have issued a circular, announcing to the members of the Institute that during the next session a trial will be made of the following arrangements, namely :—

(1) Ordinary and Other Meetings of the Session.—*a.* That the prescribed number of meetings be, as at present, fourteen. *b.* That the said fourteen Meetings consist, as at present, of one Annual, one Special (for the award of prizes), and twelve Ordinary. *c.* That four of the twelve Ordinary Meetings be devoted to business, as follows :—One to be the Opening Meeting on the first Monday in November; another to be the Closing Meeting in May, when the Royal Gold Medal is presented; the two others, if not required for adjourned Discussions, to be convened principally for the discussion of professional questions, and the interchange of opinion on matters of practice, as well as on current topics not open for criticism at other Ordinary Meetings. *d.* That the remaining eight Ordinary Meetings be devoted exclusively to the reading of Papers and Discussions thereon.

(2) The Preliminary Business.—*e.* That the ballot for new Members be taken only at the four Ordinary Meetings for business, and that notice of the same be duly sent to each proposer of the several candidates requesting his presence. *f.* That the announcement of donations of all kinds to the Library, the Library Fund, and to other funds, be made only at the four Ordinary Meetings for business. *g.* That new Members be admitted by the Chairman at any Meeting during the Session. *h.* That nominations of candidates for membership be read at such Meetings only as will conform with the terms of By-law XV., whereby a recommendation must be read at one Ordinary Meeting, hung up during that and the two successive Ordinary Meetings, at the latter of which the candidate shall be balloted for. *i.* That in announcing the nominations the name and address of the candidate shall alone be read—the nomination paper to be immediately afterwards hung on the board in the Meeting Room. *k.* That, at the eight Ordinary Meetings for the Reading of Papers and Discussions thereon, no questions other than relating to the subject of the evening be submitted.

(3) Papers and Discussions.—*l.* That subjects for Papers and Discussions be invited under the following heads :—I. New Materials, Building Appliances, and Systems of Construction; II. Architectural Works in Progress at Home and Abroad, the Foreign Papers to be translated for the authors if required; III. Fine Art, specially relating to architecture; IV. Archæology; V. Building and Municipal Legislation; VI. Sanitary Science. *m.* That the MS. of such Papers be sent to the Secretary of the Institute at least two weeks before the day of reading, and that the time occupied in reading them, or an abstract of them, do not exceed one hour. *n.* That invitations to discuss a Paper be sent to such members or visitors as may seem likely to be interested in it, and that, on receiving the consent of such members or visitors, a rough proof of the Paper be forwarded to them previous to its being read.

4. Under a fourth head, amended regulations are made as to the publication of Proceedings and Transactions.

RESIGNATION OF THE HON. SECRETARY.

The Council announce with regret that Mr. Thomas H. Wyatt, F.S.A., Past President, has retired, in consequence of ill-health, from the office of Honorary Secretary. The election of Mr. Wyatt's successor will take place at the Opening Meeting of next Session.

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At the Kent general sessions on Tuesday week, held at Maidstone, an election took place to the post of county surveyor in the room of the late Mr. Buck. His son, Mr. W. Buck, was elected, the other selected candidates out of 28 applicants being placed as follows: Mr. Ventriss, Mr. Friend, Mr. Dickinson, and Mr. Webb Turner. The remuneration is a salary of £300 a year, with 5 per cent. commission on new buildings under £300, and 3 per cent. on those above that cost, together with £1 per cent. compensation for the preparation of plans, specifications, and estimates, should they not be carried into execution.

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ILLUSTRATIONS.

ST. FRANCIS' HOME FOR BOYS, SHEFFORD.—ARCHITECTURAL MUSEUM SKETCHES. — NEW PREMISES OF THE RELIANCE LIFE ASSURANCE SOCIETY.—PROPOSED NEW CHURCH, MAESLLWCH PARK. — CHESTNUT HILL RAILWAY STATION.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ST. GEORGE'S (R.C.) CHURCH, AND ST. FRANCIS' HOME FOR BOYS, SHEFFORD, BEDFORDSHIRE.

The group of buildings in this view consists of the Church of St. George, with the Presbytery, and the entrance gateway, infirmary, and other portions of the street-front of the Home for Boys. St. Francis' Home was founded in 1870; it is now providing for fifty orphans and destitute boys, principally from the Roman Catholic diocese of Northampton, and, when completed, will accommodate about eighty. It is under the charge of the very Rev. Canon Collis. The irregular plan of the street-front has been necessitated by the position of old buildings partially retained, and the form and style have been considerably influenced by the desire to give useful employment to the boys, who, under the direction of the technical instructor, have executed the whole of the carpenter's and joiner's work in the building. The small Chapel of the mission was erected about a century since in the garden at the back of the Priest's residence, the approach to it being by a narrow passage between two houses; the Church is now to be erected with a frontage to the street, as in the view, the Chapel being preserved to serve as sacristies, &c. A view of the dormitory, schoolroom, and of the old chapel, as seen from the playground, was given in the Building News of July 26th, 1878; of the old and new buildings on October 6th, 1876; and a third, of the interior of the church, on May 28th, 1875. The architect of the whole is Mr. S. J. Nicholls, of 1, Caversham-road, London, N.W.

ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB—VARIOUS DETAILS FROM ST. ALBAN'S.

To-day we are enabled to give another of Mr. T. F. Pennington's valuable sheets of sketches, from the examples of carvings collected at the Royal Architectural Museum, Westminster. This drawing was finished on the spot in pen and ink, and it illustrates several portions of the interesting and elaborate chapel of Abbot Ramrygge, at St. Alban's Abbey. The panel is from the Chapter House, Westminster.

NEW PREMISES FOR THE RELIANCE MUTUAL LIFE ASSURANCE SOCIETY.

The new building of the Reliance Mutual Life Assurance Society, illustrated by us this week, and including Nos. 70, 71, and 72, King William-street, City, at the corner of Clement's-lane, has just been completed. The greater portion of the ground-floor is occupied by the Reliance Office, including the principal office, 37ft. by 28ft. by 17ft. high, the under-secretary's room and messengers' and waiting-rooms. The remainder of ground-floor is let to the National Fire Insurance Corporation. On the first floor are the Board and Committee, and Medical Officer's rooms, with lavatories, &c., for the Reliance, and board-room for the National. The three upper floors are divided into offices, and the basement is divided into strong-rooms and clerks' lavatories, w.c.'s, &c. The internal arrangements include a passenger hydraulic lift from top to bottom. The internal fittings of ground and first floor are of Spanish mahogany. Externally, a bold central doorway, divided, gives access, on the one hand, to the Reliance offices only, and, on the other, to the National, and other offices. The material used externally are red granite and stone. The architect is Mr. Fred. Chancellor, of 8, Finsbury Circus, City, and the builders are Messrs. Perry and Co., of Bow.

MEMORIAL CHURCH, MAESLLWCH PARK, RADNORSHIRE.

This church, to accommodate 232 persons, was designed to cost £2,000, exclusive of the spire and belfry stage; the materials being local greystone with Forest of Dean dressings for the walls, and internally faced with Bathstone ashlar, the roofs covered with red tiles. Our illustration is taken from a drawing in the present exhibition at the Royal Academy by Mr. Francis E. Jones, of Messrs. W. S. Weatherley and F. E. Jones, 20, Cockspur-street, London, S.W.

CHESTNUT-HILL STATION ON THE NEW YORK AND GREENWOOD LAKE RAILWAY, U.S.A.

This American railway-station is now in course of erection, from the designs and full-size details furnished by Mr. Maurice B. Adams, A.R.I.B.A., architect, of London. It is intended for the use of the residents on Mr. Edward S. Wilde's Estate, at Bloomfield, and the adjoining property on the Greenwood Lake Railway, twelve miles from New York. In America property owners along new lines of railway always have to furnish the money and build their own stations, with but very little help from the railway companies, although the stations thus erected have to be designed in conformity with the regulations laid down by those who have constructed the lines. One regulation to be observed is that a covered way in front of the station building facing the platforms shall be erected without posts or columns, and so in the present case this has been done, while the internal arrangements had also to be regulated as shown for similar reasons. The plans and elevations which we give are simply reproductions, at a reduced scale, of the working drawings, and thus they really explain themselves. The construction is entirely of timber, after the American manner of building, on a base wall of brick and stone, having a creamy white rough cast finished surface between the timbers, which are coloured a dark rich brown. The roofs are covered with tiles, and the clock-dial next the railway is in bronze. The bell fixed in the turret is worked from the platform. The site is on an elevated and prominent position, which immediately adjoins Mr. Wilde's new estate, on which picturesque and commodious houses are being erected, and where a church for the use of the residents is shortly to be undertaken. One of the detached houses, designed by Mr. Adams, Mr. Wilde's architect, was published in the Building News for August 15, 1879, and others are now in progress in this prettily-wooded and rapidly-increasing suburb of New York, where Mr. Wilde's undertakings are exciting some attention.

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THE TEMPLES OF PAESTUM.*

Comparatively few tourists in Italy have visited Paestum, owing partly to the malaria and the effort required, but chiefly to the dangerous exposures to brigandage. Even now it is prudent to go in a considerable company and be as expeditious as possible. We took a very early start from Naples to Battipaglia, a station three quarters of an hour beyond Salerno, whither we had despatched three horses the preceding evening from Salerno. Arriving at Battipaglia about eleven, we drove as rapidly as possible to Paestum, a distance of thirteen miles, passing two hours there, and returning in time to take the five o'clock train for Naples, so as to reach there that night. Immediately on leaving the railway station we entered a vast marshy plain, where herds of buffaloes were grazing, tended by uncouthly-clad herdsmen. Many wild fowl flew up as we passed along, and occasionally a disconsolate group of malaria-smitten people sat by the wayside. Here and there a distant farm-house rose to view. Our guide pointed out some very malarious spots, and the forest of Persano where brigands commonly inhabited. About three miles from Paestum we crossed that fiery little river, the Sele, the scene of Manzi's most daring exploits as highwayman. On the left, at considerable distance, the mountains presented a bold and rough appearance; just before us lay the blue Mediterranean; the Italian sky cast its peculiar haze upon mountain, land, and sea. Suddenly, perhaps a mile away, appeared the Doric temples, in a simple and stern grandeur, column after column in beautiful outline and majesty, producing as clear and entrancing architectural impressions as I have ever received at the first sight of a noble building. Nor did the distance prove to be the enchantment: a close survey of the finest of the ruins (why call them ruins?) allowed me to fully accept what Professor Reinhard Kekule said of one who views them, "that he will find the impression produced, conspicuously that of the Temple of Neptune, almost more overpowering than even the spectacle of the Roman Forum."

Standing just before the massive and symmetrical structure, your eye marvels at the perfect proportions and at the grand strength displayed without display. No Alhambric architect produced so solemn a temple; no delicate skill could grasp such stately force and give it so full an expression. You cannot, at first, descend to numerals; when you do you find there are thirty-six fluted Doric columns of a diameter of seven and a half feet, six being at either end and twelve on each side. Within are two series of eight columns, each with a diameter of six feet; also a row of columns above that formerly supported the roof. The stone, a kind of travertine, is richly mellowed by age. Of the colour of cork, it has cork-like imperfections or crevices, wherein snails abide and sprays of green take root. Fossil reeds and aquatic plants spring from all the stones, and a rich growth of ferns and acanthus-leaves covers the floor of the temples. No vestiges of the rose-gardens so glowingly sung by the poets of Rome now remain. You look for "the rustling lizard and the gliding snake," to find many of the former and the latter as rare as the owls of the Coliseum that poets locate there.

You now scan the second temple placed a little to the south of that of Neptune. Less majestic, it is still very impressive. The fifty columns of travertine stone, each between six and seven feet in diameter, taper upward in a curve, and the capitals are of a peculiar form. This temple is divided into halves by a series of central columns. A short walk brings you to the third structure, usually called the Temple of Ceres, which has a fine peristyle of thirty-four columns, each having a diameter of five feet. Over the six columns which stand at the head of the temple an imposing front still remains, and the shafts at the other end support a large remnant of the blocks that upheld the roof.

Little can be said of these ruinous temples by way of minute description, because they are of strength and "beauty unadorned." They are simply grand, chiefly because they are grandly simple. A profusion of words would not help the matter; and even the photograph fails to present a just impression of the grandeur of these Doric temples, so well preserved amidst the wear of time and man.

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Extensive premises for the Longridge Industrial Co-operative Society were opened on Saturday last. They have a frontage of 54ft. 6in. with a depth of 64ft.; in the basement are roomy cellars for stores; on the ground-floor are three shops and warehouse behind, with cart entrance. On the first floor are office, board-room, conversation-room, store-rooms, and warehouse behind, with lavatories and ladies' room. On the second floor is a public hall, with serving and retiring-rooms, capable of seating 600 or 700 persons. The whole is substantially built of stone at a total cost of £2,700, under the superintendence of Messrs. Laxworth and Gardner, of Preston.

The corner-stone of a new church at Gattey, in Etchells, Cheshire, was laid on Saturday week.

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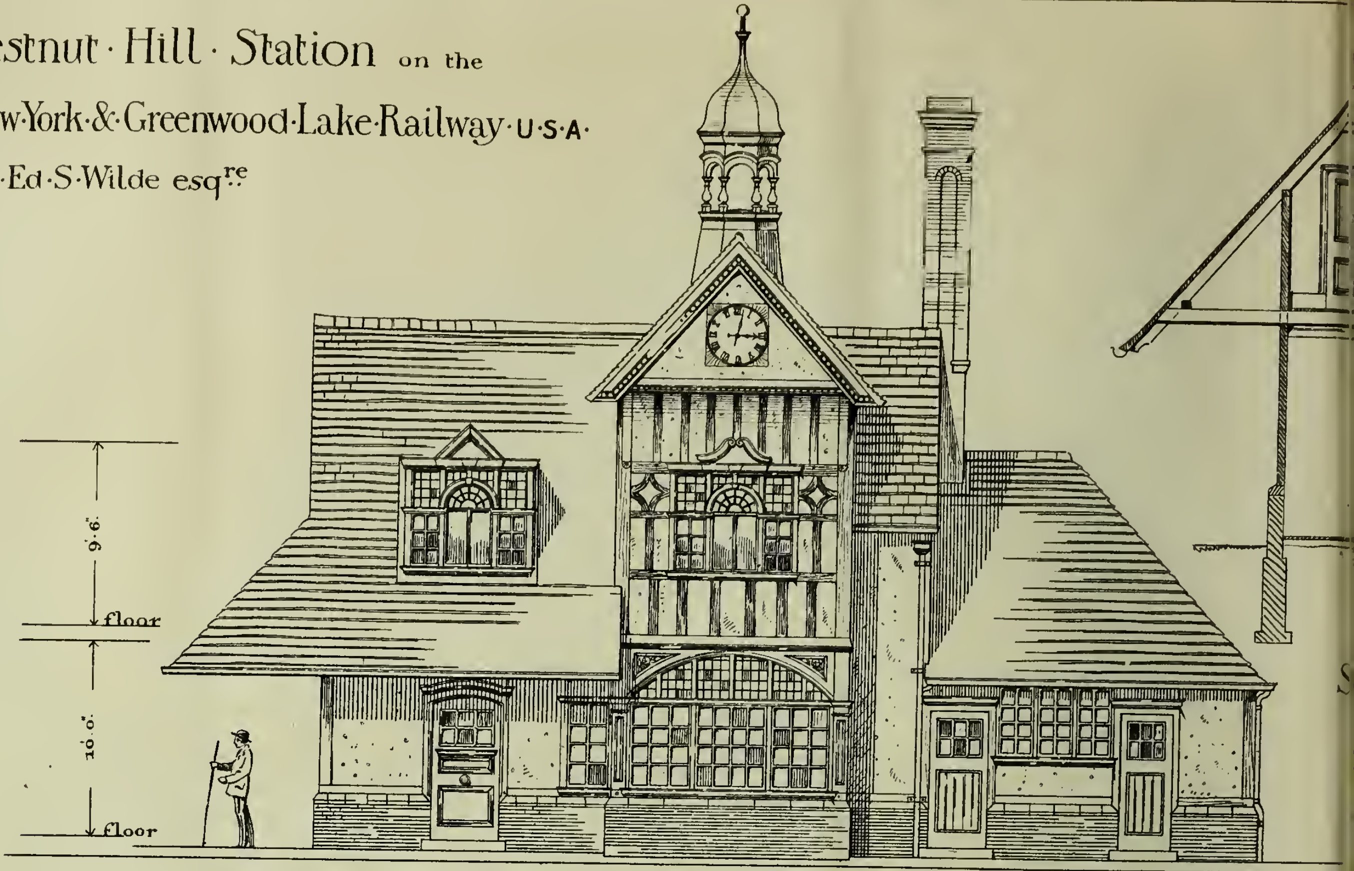
* By the Rev. W. C. Winslow, in the *American Churchman.*

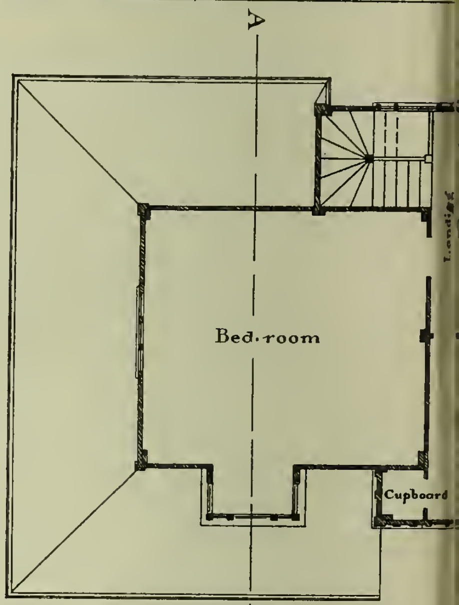
Chestnut · Hill · Station on the New·York·&·Greenwood·Lake·Railway·U·S·A·

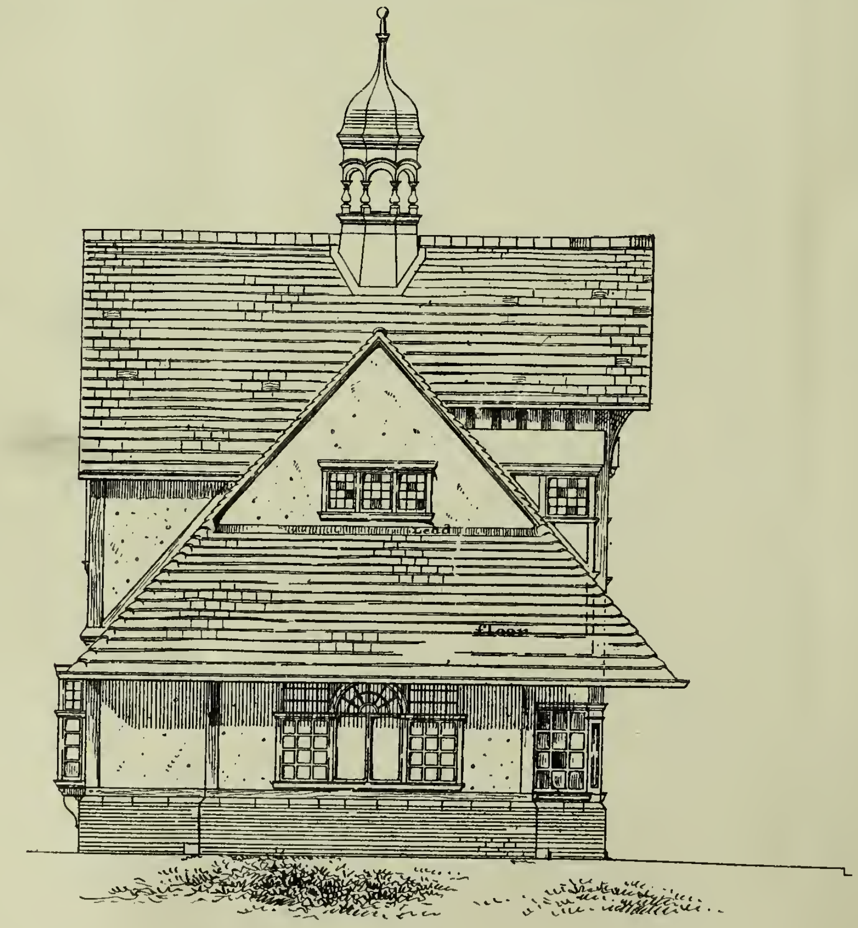
for·Ed·S·Wilde esq^re^



North · front ·

Scale · of · feet ·





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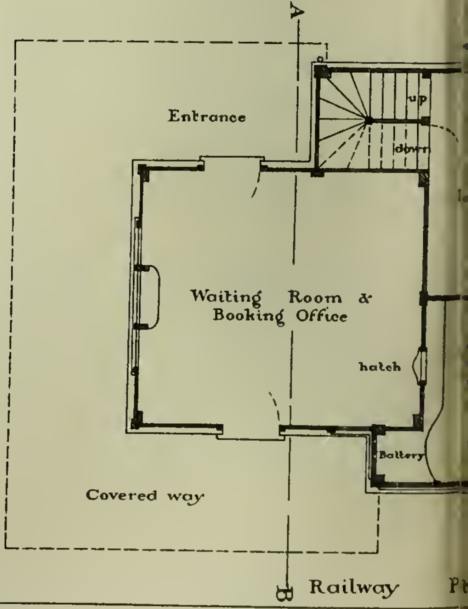

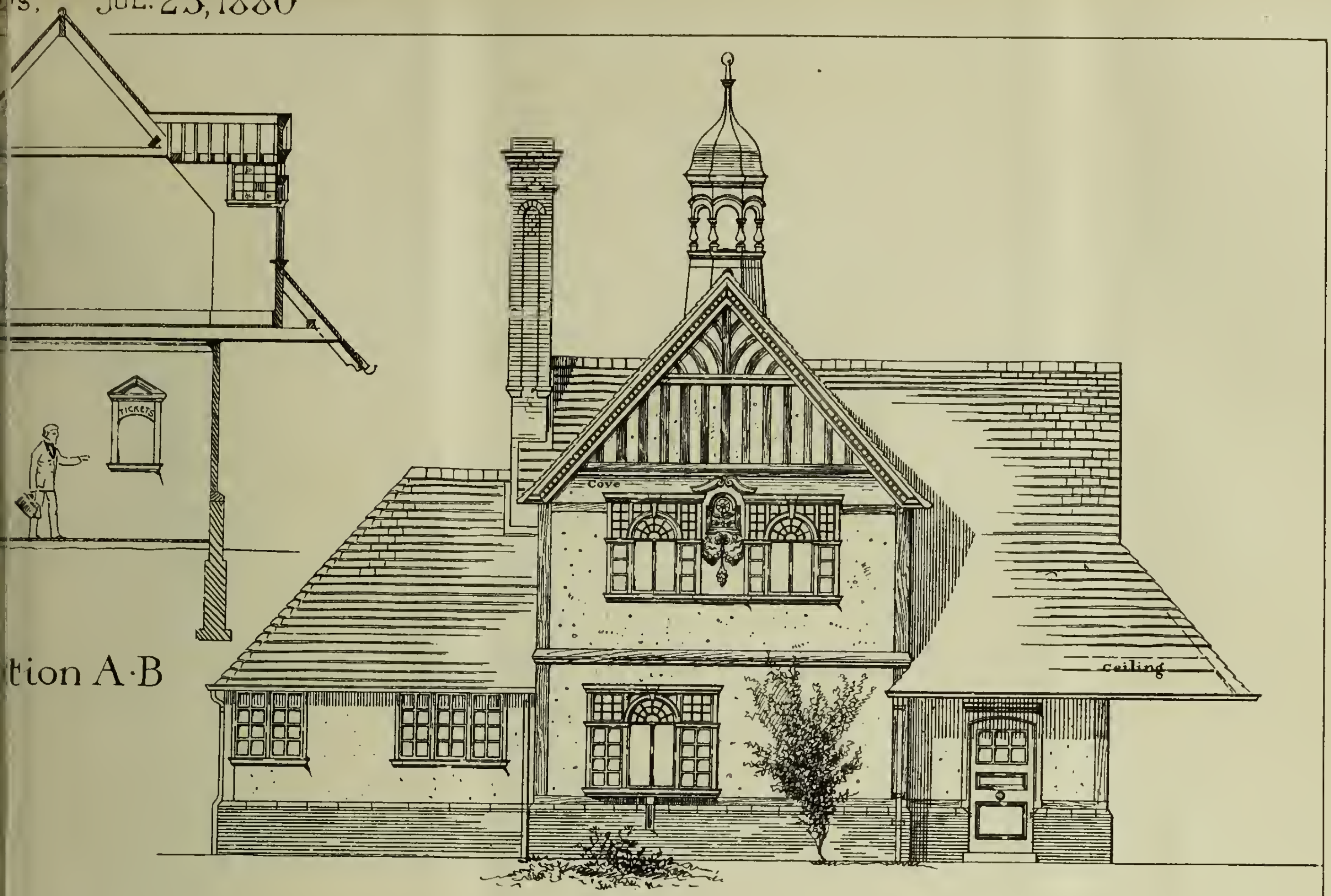

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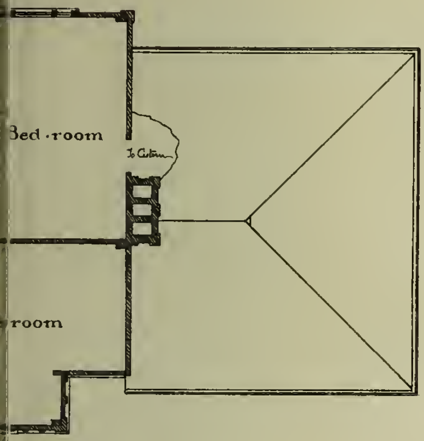
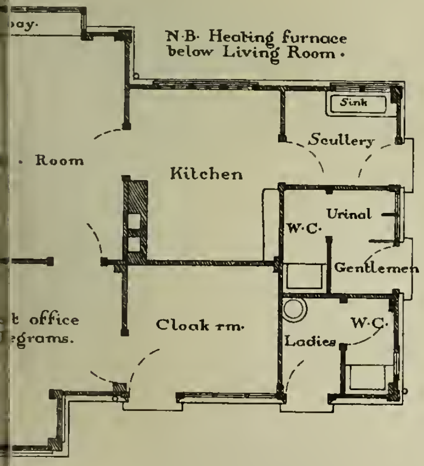
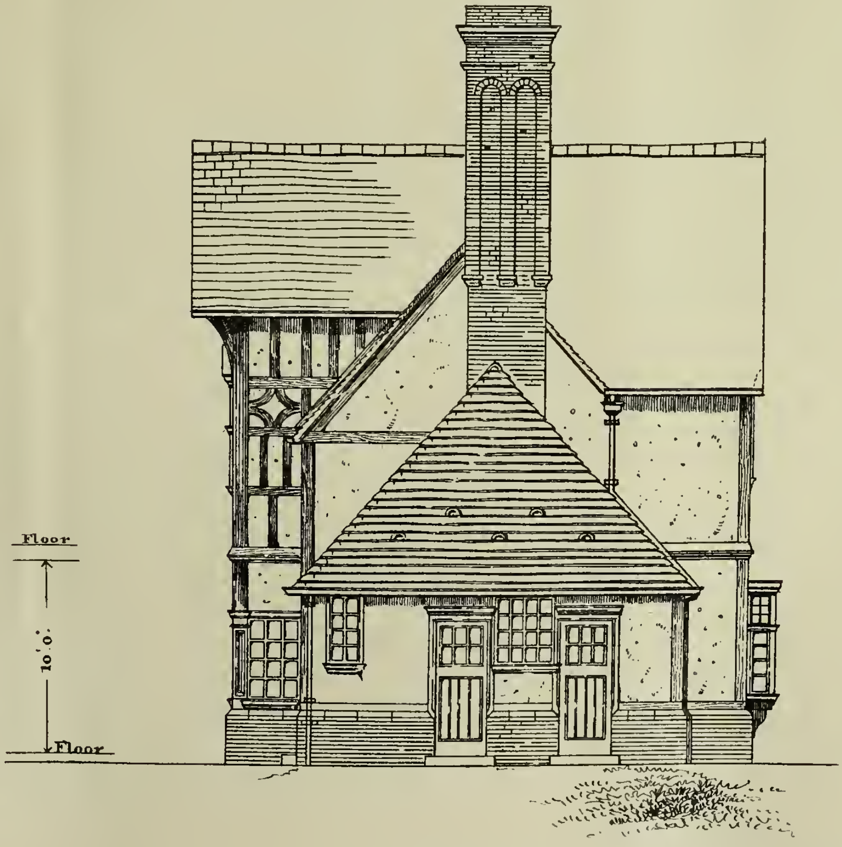


rst·Floor·Plan



Ground plan



West ·end·

Maurice B·Adams A·R·I·B·A
Architect.

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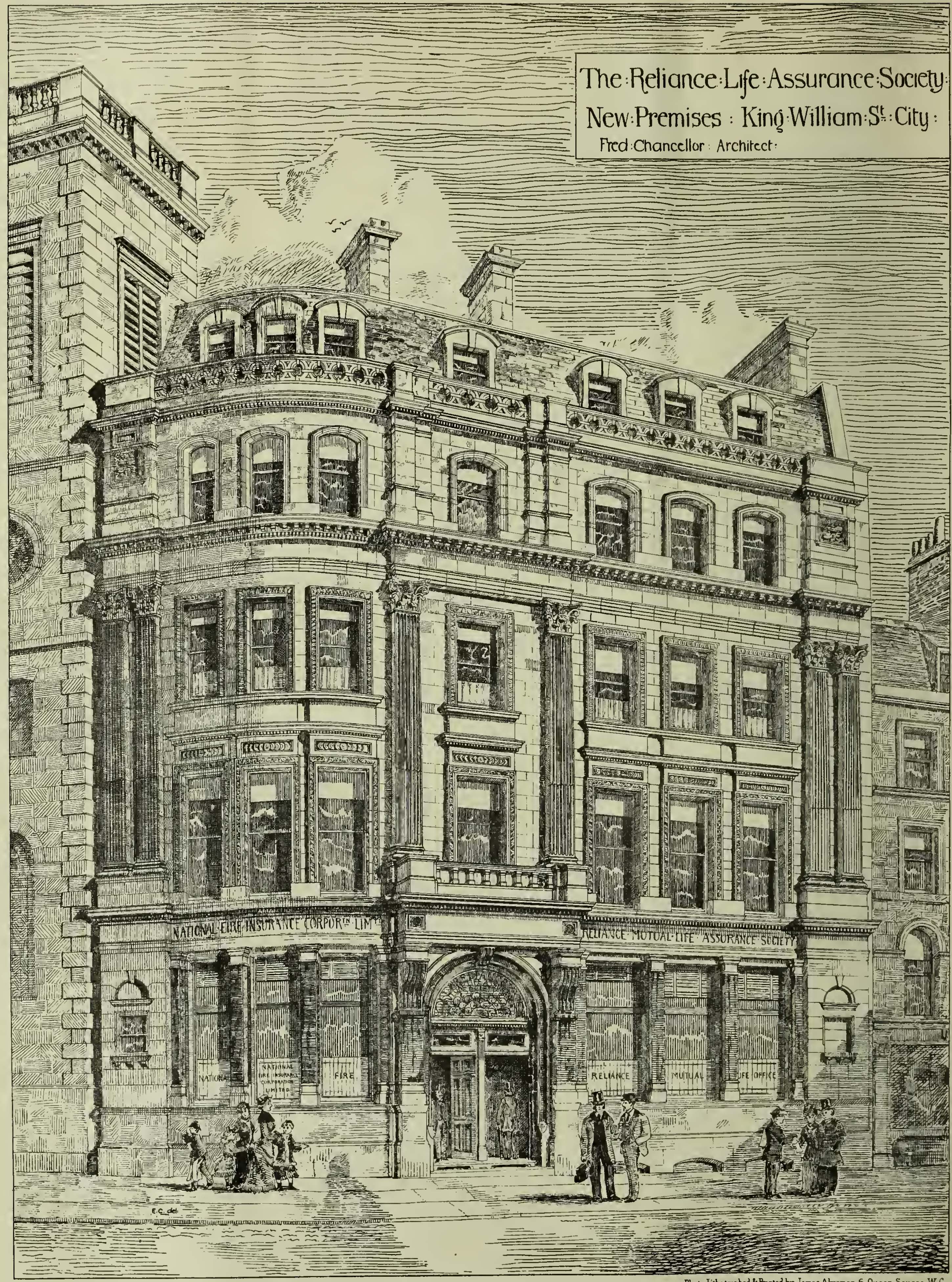
Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C



The Reliance Life Assurance Society
New Premises : King William St. City :
Fred Chancellor : Architect :

NATIONAL FIRE INSURANCE CORPORn LIMd
RELIANCE MUTUAL LIFE ASSURANCE SOCIETY
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Photo-Lithographed & Printed by James Akerman, 6, Queen Square. W C

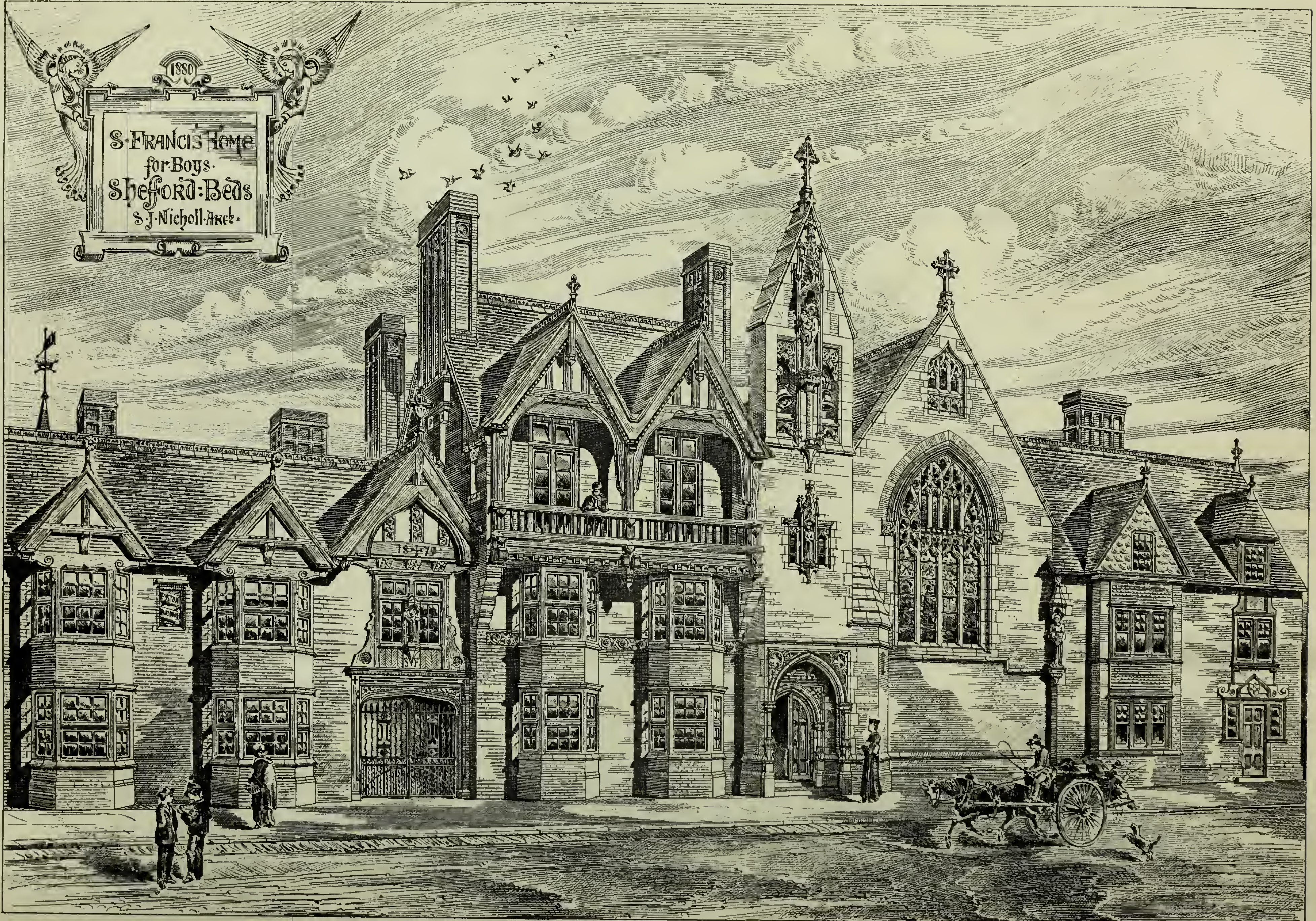
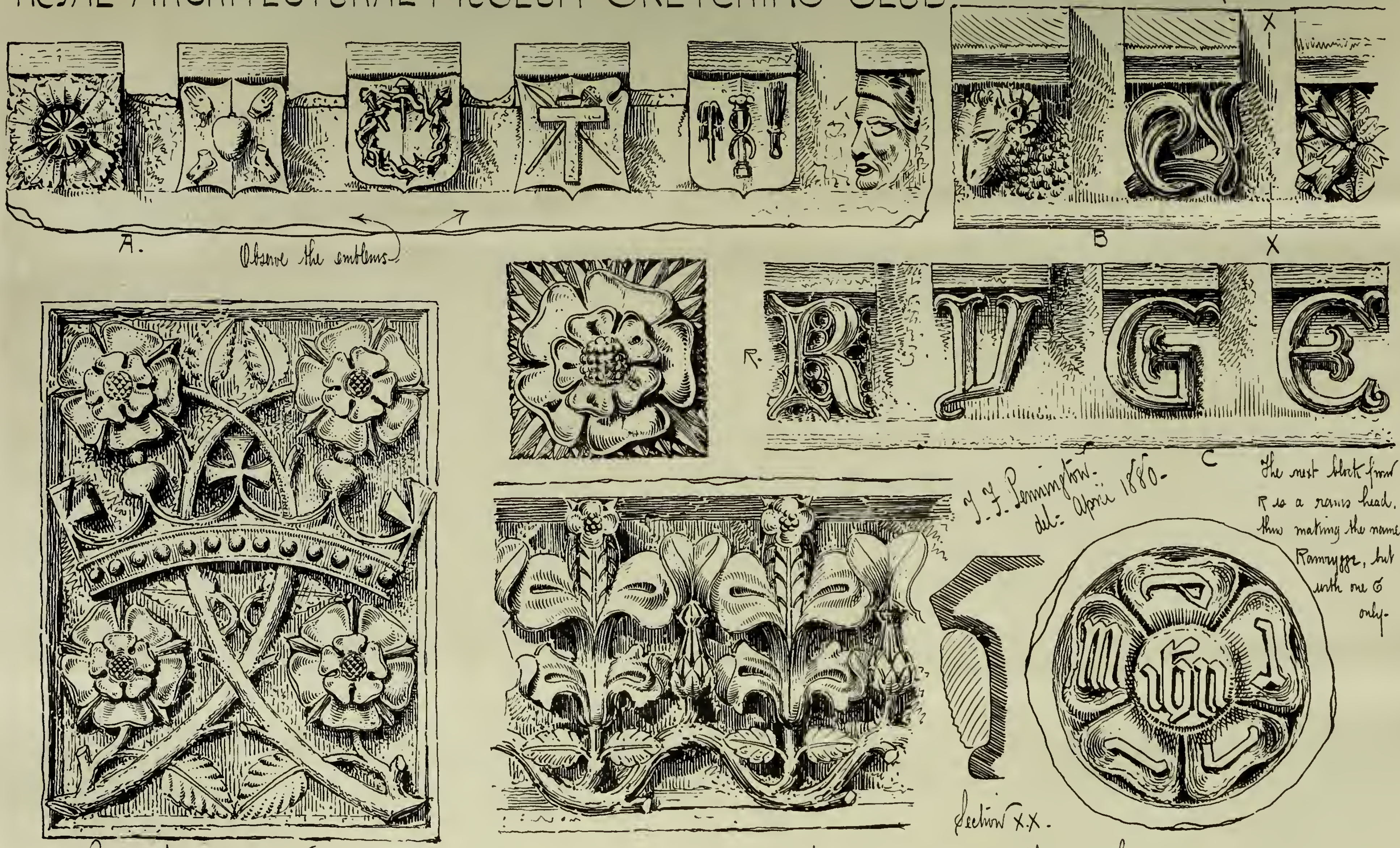


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

ROYAL ARCHITECTURAL MUSEUM SKETCHING CLUB

VARIOUS DETAILS: THREE-QUARTERS FULL SIZE



Observe the emblems.

J. T. Pennington del: April 1880.

The next block from R is a rams head, thus making the name Ramrygge, but with one G only.

Panel. Chapter House. Westminster Abbey.

A. B. C. From Abbot Ramrygge's Chapel. St. Alban's Abbey. Herts.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

PROPOSED · NEW · CHVRCH
MAESLLWCH Pk RADNORSHR
W. S. WEATHERLEY & F. E. JONES, ARCHts

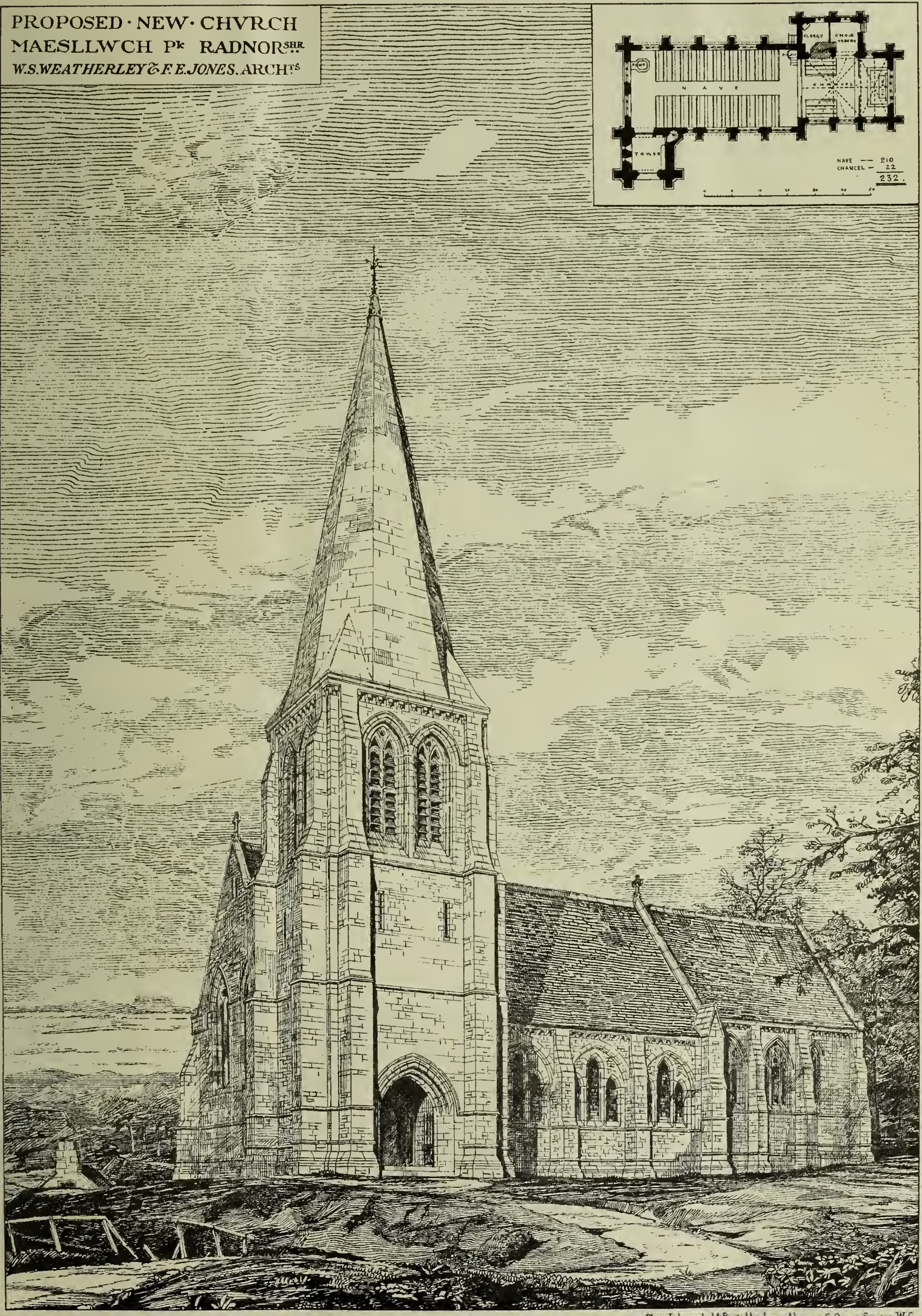


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

THE PRESERVATION OF TIMBER.*

THE trustees for the bondholders of the New Orleans and Mobile Railroad had become so thoroughly convinced of the value of coal-tar oil as a preventive of decay in timber—which takes place rapidly in the long, warm seasons of that latitude, and of the ravages of the teredo, which is abundant and destructive to the numerous and long bridges which cross the bays and inlets along their line—that they decided in the winter of 1874-5 to creosote the piles and timber used in bridge construction. As no works could be found in this country treating timber thoroughly enough to be satisfactory, it was thought advisable to build machinery and do the work on a plan different from any then in operation. Accordingly, works were erected at West Pascagoula, Miss., at a cost of about fifty thousand dollars, and all the bridges and waterways on the road have been constructed of creosoted timber, except the long spans of trusses, which are of iron. The work has been eminently satisfactory. Pile piers have been built which bid fair to outlast their iron superstructure.

These works contain two reservoir tanks for storing oil, placed in the ground; two tanks for treating timber, 6ft. diameter inside by 100ft. long; a large tubular condenser and pump for supplying it with water, a large vacuum pump, an oil pump, a powerful force pump, a hoisting engine for handling timber, a pair of boilers capable of furnishing the required steam, and a super-heater. These are all connected by the requisite pipes and valves. Each treating tank contains nearly five thousand feet of one-inch pipe arranged in coils, through which superheated steam is passed for seasoning timber, and also iron rails upon which cars loaded with timber are moved in and out. Both heads of the treating-tanks are movable. At suitable distances are transfer-derricks for loading and unloading timber. A large number of piles, ninety and ninety-five feet long, have been handled with them. In work, piles are cleaned of dirt and bark, butted and sharpened, and timber cut and framed ready to be put in position. It is then loaded on iron cars, built for the purpose, and hauled into the tank. Steam is then turned in through a perforated pipe extending along the inside at the bottom of the tank. This is continued until the timber has become heated through. The vapour is then condensed, and a partial vacuum produced. Super-heated steam is passed continually through the coils of pipe to vaporise the sap and moisture contained in the timber, and as fast as vaporised it is condensed. A partial vacuum being maintained, the moisture vaporises at a low temperature, and the seasoning proceeds rapidly. When the timber has become properly seasoned the tank is filled with oil and a pressure applied by means of the pressure-pump of from one hundred and fifty to two hundred pounds per square inch. This pressure is maintained until the pressure-gauge remains constant, showing that the timber will absorb no more oil. The oil is then drawn off, the load drawn out, and another load which has meanwhile been prepared drawn in and the process repeated. The consumption of oil by this process has usually been from twelve to eighteen pounds per cubic foot, or from one and one-fourth gallons to two gallons per cubic foot. Over three gallons per cubic foot have been injected in some loads.

The main features of our plan of treatment are the extraction of the sap or moisture in the timber to prevent fermentation, and also to provide room for oil. Timber can no more be steamed dry than it could be seasoned by boiling. The timber, being cooler than steam, would condense and absorb it, thus accumulating moisture. Water cannot be drawn out of timber by a vacuum alone. If timber retained its moisture by atmospheric pressure, then by removing such pressure it would flow out. But moisture is retained in timber by capillary attraction, which is left in full force when atmospheric pressure is removed. We steam timber to heat it through, as being the simplest method of conveying heat; then condense the steam and pump out the air to produce a partial vacuum. It is well known that water vaporises in a vacuum at a low temperature. While under pressure the degree of heat at which it vaporises rises to correspond with the pressure applied. By maintaining a partial vacuum we are enabled to vaporise the moisture rapidly, and at a temperature which will not injure the timber. When the pressure is removed by condensation, the heat absorbed by the timber during the steaming expands the moisture by vaporising and drives it out. Superheated steam is passed through the coils of one-inch pipe in the treating-tank to maintain the temperature and assist in vaporising the moisture, and as fast as vaporised the moisture is drawn away by the condenser. This process is continued until the timber has become satisfactorily seasoned, when the tank is filled with oil and a pressure of from one hundred and fifty to two hundred pounds per square inch is applied until the timber will absorb no more oil.

It is now nearly four years since the construction of bridges with creosoted timbers was commenced, and during that time not a fire has caught in the new work from passing trains, while on bridges constructed of uncreosoted timber watchmen were a continual necessity. In this respect we are happily disappointed.

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THE TAY BRIDGE DISASTER.

THERE was published, on Wednesday afternoon, an important report, giving the minute of the Board of Trade on the Tay Bridge disaster, which was agreed to at the Council Chamber, Whitehall, on July 15th. It is as follows:—

"My Lords have carefully considered the remarks of Major-General Hutchinson and the reports of the Commission appointed to inquire into the fall of the Tay Bridge. They desire, in the first place, to state that they have always placed entire confidence in Major-General Hutchinson. No more competent, conscientious, and intelligent officer could have been found to whom to intrust the inspection of the structure in question, and they are of opinion that his conduct of that inspection has not been such as to forfeit their confidence. In order that there may be no misapprehension of the limit of the duty of the Board of Trade and its officers, they think it right to add the following observations:—By the Act 5 and 6 Victoria, chap. 55, every railway company is bound to give notice to the Board of Trade of their intention to open any line, or portion of line, and the Board of Trade have then the power to appoint an officer to inspect the work, and if that officer reports that the opening would be attended with danger to the public by reason of the incompleteness of the works and permanent way, or insufficiency of establishment for working the railway, together with the grounds of his opinion, the Board of Trade have power, within ten days, to postpone the opening. In the absence of a report to the above effect, the Board of Trade have no powers in the matter, and the company are at liberty, on their own responsibility, to open the line and to convey passengers over it. The Board of Trade have no power to require the companies to submit plans of new works before they are constructed, nor have the Board of Trade or its officers any power to inspect or supervise the works while in progress. The Board of Trade officers are therefore not placed in a position to express an opinion upon the design of the work before it is constructed, nor upon the workmanship and materials whilst it is progress. All that the inspecting officer of the Board of Trade can do is to visit the work when notice is given by the company that it is complete, and then and there to form such an opinion as the circumstances permit of its completeness. Neither has the Board of Trade any power to sanction the opening of any new work subject to any conditions. They must either postpone the opening altogether, or leave the line to be opened. Nor has the Board any power, after the work is once opened, to compel the company to keep and maintain it in proper repair, or to make such alterations or additions as they may think fit. Under these circumstances it is clear that Major-General Hutchinson could not be responsible for any defects in the Tay Bridge which were not discoverable on such an inspection as he was empowered to make. It is clear that he cannot be held responsible for faults in the material and workmanship which were not visible when the work was finished and painted; still less for defects which did not exist until after his inspection. As regards design, it may be said that he ought to have seen that the work was essentially weak, and to have reported accordingly; but this is, to say the least, extremely doubtful. The duty of an inspecting-officer, so far as regards design, is to see that the construction is not such as to transgress those rules and precautions which practice and experience have proved to be necessary for safety. If he were to go beyond this, or if he were to make himself responsible for every novel design, and if he were to attempt to introduce new rules and practices not accepted by the profession, he would be removing from the civil engineer and taking upon himself a responsibility not committed to him by Parliament.

In the present case the work was submitted to the ordinary tests, and it might still have been standing had proper means been taken to maintain it. Major-General Hutchinson seems, indeed, to have suspected its weakness, and gave a warning which was not sufficiently attended to. Had he stated explicity, in addition, that in his opinion the structure, though not incomplete within the meaning of the Act, was weak in design, and would therefore require special care in maintenance, his report would have suggested precautions which have been neglected, and which events have since proved to have been necessary, though it would have gone beyond the letter of the statue under which he was acting.

The Board of Trade are unwilling to conclude this minute without some general remarks on the policy of the legislation to which they have adverted. It may appear to some that the present state of things is one which cannot be logically defended, and that the Board of Trade ought to be intrusted with further powers. The experience of a great number of years has, however, shown that the present system does not work unsatisfactorily, and a little consideration will show that the public safety and convenience would not be promoted by such a change.

In the first place, if the Board of Trade were to be held responsible for the designs of railway structures and for the supervision of their execution, they must employ a staff as experienced, as numerous, and probably as highly remunerated as the civil engineers by and under whom these structures are now designed and executed. It is scarcely necessary to observe on the impracticability of such a step.

But this is not all. If any public department were intrusted with the power and the duty of correcting and guaranteeing the designs of those engineers who are responsible for railway structures, the result would be to check and control the enterprise which has done so much for the country, and to substitute for the real responsibility which rests on the railway engineer the unreal and delusive responsibility of a public office. At the present moment there is no one who is more deserving of pity than the civil engineer who designed and constructed the Tay Bridge, and who, as the law now stands, is held responsible for its defects. With his case in view, it is in the highest degree improbable that any civil engineer intrusted with a similar task in future will commit similar errors. Had the law been such as to make the report of the inspecting officer a guarantee for the design, this responsibility would have been removed from the civil engineer, and the public would, instead, have had to trust to a public officer whose knowledge and control must be comparatively inadequate, and against whom no similar responsibility can be enforced. In like manner, to impose on any public department the duty of exercising a control over the current management of railways would be attended with equal difficulty and danger. To say nothing of the necessary evils of double management, any Government department exercising such control would, if slack in their supervision, appear to guarantee methods of working which might be really faulty and insufficient, and would, if the supervision were more stringent, interfere with railway management to such an extent as to alienate from it the public confidence and destroy with it its moral influence and its capacity for usefulness. Whilst, therefore, it must be fully admitted that the public safety in the first place, and public convenience in the second, are the principal if not the only considerations which ought to govern such cases, it appears that these objects would not be promoted if a greater responsibility rested with the Board of Trade and its officers, and a lesser resposibility with the company and their engineer.

J. CHAMBERLAIN.

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* By J. W. PUTNAM, A.S.C.E., in the *Scientific American Supplement.*

OBSERVATIONS OF MAJOR-GENERAL HUTCHINSON.

In compliance with the terms of your minute inclosing copies of the reports of the Court of Inquiry and of Mr. Rothery on the fall of the Tay Bridge, and stating that the President of the Board of Trade wished to be furnished with any observations I might have to offer bearing upon the remarks made with reference to my inspection of that bridge, I would merely repeat the substance of my evidence before the Court of Inquiry, namely, that I was appointed to inspect the Tay Bridge on the 15th of February, 1878, and received at about the same time the plans and details relating to its construction, these plans and details having been the first information with which the Board of Trade had been furnished concerning the mode of carrying out this important work; that I devoted much anxious care and thought to this important duty, both before the inspection and during the three days (25th, 26th, and 27th February) that the inspection lasted; that as regards the theoretical strength of the bridge for carrying the weights to which it might be subjected, it appeared to be sufficiently strong; that under a test load of six heavy engines, run over it at various speeds up to 40 miles an hour, the high girders showed very moderate deflections and very little lateral movement; that from as careful examination as I was able to make, both before and after test, I saw no structural defects to excite any uneasy feeling either about the quality of the materials employed or the way in which they had been put together; and that I was consequently justified in assuming that the work was sound and the workmanship good; but that, nevertheless, having regard to the comparatively narrow base of the piers and their composite structure, it was desirable to submit them to as little racking motion as possible, and that I therefore recommended a moderate speed, not exceeding 25 miles an hour, to be observed in running over the bridge; that with regard to wind pressure there had been in this country no definite rules laid down for guidance, and that it had not been customary in open structures, such as the Tay Bridge, to consider the subject, as the necessary stability given to the piers for other considerations would enable them to bear any probable wind pressure that would come upon them. Had I, however, entered into calculations upon that subject, the theoretical results I should have arrived at with such data as were available at the time, would not, I believe, have justified me in recommending the Board of Trade to object to the opening of the bridge on the ground of insufficient strength to resist any anticipated wind pressure. Further, that as the bridge appeared to have been (as from the only means I had of judging, viz., from the plans and inspection after completion, I was justified in assuming it to have been) constructed of good materials, well put together, that it had well stood the tests to which it had been submitted, and assuming (as I was again justified in assuming) that it would be well and carefully maintained, there was no sufficient reason to justify me in recommending the Board of Trade to object to the railway over the Tay Bridge being opened for public traffic, subject to the recommendation as to the limitation of speed to 25 miles an hour.

Owing to the magnitude and importance of the structure, I was anxious to see how far the lateral stiffness of the piers (which had been satisfactorily under the test of engines running fast over it) might be affected by the action of high wind upon the side of a train in motion over the bridge.

This I had intended to get, if possible, an opportunity of doing before the traffic commenced running, but I was laid aside by serious illness shortly after the inspection, and before my recovery the bridge had been opened for traffic. C. S. HUTCHINSON.

12th July, 1880.

DECORATIVE ART.

ENGLISHMEN boast, writes Mr. Lewis F. Day, in the *Magazine of Art*, that they are proud of their homes, and attached to them. They may be so. Only few homes look as if any one had any intelligent interest in them. You may go from house to house among your neighbours, and from no one dwelling shall you be able to gather a distinct impression of its owner. Each reflects the others, or rather they are all reflections, paler or more pronounced, as the case may be, of what is, or was, the prevailing fashion. The exceptions to the rule will be few, and these shall betray, not the more loving householder, but the more "advanced" decorator. If by chance some particle of the personality of the man whose house it is peeps out, the odds are that it strikes a false note in the general effect. Those who have heedlessly succumbed to the decorative mania often begin too late to find that the little comforts and conveniences to which they were accustomed are out of keeping with their "fine art" furniture, and they blindly attribute to the fault of art what is in fact due to the thoughtlessness with which they adopted a fashion altogether out of accord with their individual wants and ways. All the railing against "æsthetic" furniture and its inconvenience, all the sneers against art that is uppermost in the house, all the protests in favour of usefulness and cosiness and comfort (implying unquotable maledictions on art and its unserviceableness), resolve themselves into so many unconscious confessions of ignorance concerning the relation of art to every-day life. The furniture that is inconvenient, no matter what the waste of workmanship, sins against taste as well as reason. To revolutionise the household is very far from being the function of art at all. And if use, cosiness, and comfort cannot be reconciled with beauty, blame the artist for his incompetence, but do not condemn art because its votary is unequal to the occasion.

It is at the starting-point of decoration that the most fatal blunders are made. Some effect that we have seen, some "style" that is in fashion, something that may be quite contrary to our way of life, catches our fancy; and we proceed to revolutionise the house, and, in the name of art, to render ourselves uncomfortable, dragging that name into the contempt of all who have retained their sober senses.

How happens it that the word "homely" is associated with ugliness? A certain simplicity and sobriety are, rightly enough, in character with the life of simple, sober people; but the Puritan protest against luxury, looseness, and extravagance was more earnest than discriminating. The arts, whose highest development was naturally found in princely palaces, fell into disrepute along with their royal patrons, and to this day they have scarcely regained their prestige among the sterner and more matter-of-fact—I will not say more Puritan—Englishmen.

The abuse of art does not condemn it. There is nothing incompatible between homeliness and beauty, unless, indeed, a man love ugliness, and then beauty is out of her element within his walls. A man's home should seem to have grown round him like a shell; it should fit him as naturally; and there is no reason why it should not be as beautiful as any shell that ever housed fish. It does not seem much to ask that a man's home should appear to belong to him; but the modern manner is to rub down all personal and characteristic angles to a dead-level of polish that reflects just what happens to come in contact with it. To be individual is to be in continual danger of offending against social *convenances*. Thus it comes to pass that persons of real taste fit up their houses tastelessly, intelligent people senselessly, and men and women of refinement satisfy themselves, in this one respect, with something like very much vulgarity.

Too much is left to the decorator; too much is expected of him.

It happens frequently that the persons who apply to him have formed no notion of what they want in the way of decoration. I think they should have something more than a notion. What your ideal of a room may be it is quite beyond the province of any one but your most intimate friend to divine. Whether you prefer a light room or a dark one, a rich decoration or a delicate one, is a matter of choice—of temperament perhaps, or of eyesight. If you leave it in the hands of an artist, he may succeed in producing something very admirable indeed, but which you cannot in the least admire, because it is not in the direction towards which your sympathies tend. If you leave it in the hands of a tradesman, he too (having an artist in his employ), may do something equally good, or something very bad; but, in either case, what character there is in it belongs to the particular workshop whence it was derived, whereas what is wanted in domestic decoration is the character of the inhabitant. This will possibly not be very readily conceded; but it is acknowledged by implication in the common remark that decoration gives to a house an air of discomfort. The decoration that does so was from the first ill-advised. What else is to be said of decoration, when it is not till the novelty of it begins to wear off that folks dare to be themselves in their rooms, and to admit those familiar and necessary conveniences and comforts that make home homely? The mistake was in ever thinking to exclude them. The decorator should take those very personal and individual wants into consideration from the first, and, indeed, found his scheme of decoration upon them. He should begin by consulting his patron and finding out what he wants, advising him against that which is impractical, protesting against that which is tasteless, and striving always not to carry out some fine ideas of his own, but to put into working order those of his employer. His business is not so much to think for his patron as to put his thoughts into artistic form. A mean ambition, you say! Perhaps. And yet the poets we most esteem are not those who tell us something that is new to us, but those who most perfectly express for us the thought that was ours before—vague and bodiless hitherto, henceforth and for ever now a definite delight.

Decorative art may very readily be associated with every comfort and convenience; it will add to, instead of detracting from, homeliness, oneness, and character; if only we begin *from ourselves*, if our art is based upon our wants, if our single aim is honestly to express our best selves in our surroundings. The veritable demons that come between art and homeliness are Insincerity, Half-heartedness, and Brag.

The circumstances under which our houses assume their incongruous appearance go far to account for it. Before ever the tenant came into possession the walls were hung with paper selected by the builder, in whose eyes those patterns are most beautiful on which the largest trade discount is allowed. The dining-room, of course, is red, the woodwork wainscot or walnut; the drawing-room white and gold, with folding-doors of most marvellous maple. The bedrooms have been painted with a cold greyish-white, and papered with a view to smartness, and without regard to repose. Even if we were in time to have a voice in these things, and chose them with some taste, they were most likely determined without any forethought for the further furnishing of the rooms. Each individual item of decoration was chosen for its intrinsic excellence, perhaps, more likely for its cheapness, possibly for no better reason than that it was novel. The carpet owes its selection to the effect of a yard of it seen amongst a distracting variety of patterns by a purchaser who could have but a faint conception of what its effect *en masse* would be. It bears no sort of relation to the rest of the furniture, most of which was rashly ordered on the ground of its effectiveness in the show-room, and remains ever since a reproach to our indiscretion. The pictures are such as chanced to catch the fancy of the owner, who did not pause to think how they would look on his walls, or where he should find room for them. The ornaments of bronze, brass, ormolu, ivory, alabaster, china, terra-cotta, lacquer, wax-work, or embroidery, are more ill-assorted than all; being, for the most part, the gifts of various kind friends of very various tastes, each of whom presented what he or she thought "pretty." It would be difficult to imagine more unfavourable conditions than those for the introduction of art into the house. It is only after years of gradual weeding out of the inappropriate and gradual introduction of what is really fit, that many a home begins to assume its homely character. Habit and convenience effect, perhaps, at last what it should have been the first object of art to produce—oneness and repose.

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The new Grosvenor Park Baptist Chapel, Chester, was opened on Tuesday week. The chapel has been built from designs of Mr. J. Douglas, of Chester, and the contractor for the work was Mr. W. Vernon. The materials used for the outside are red Rudlow brick for the walling, Cefn stone for the dressings, and crown tiles for the roofs. The dimensions of the building are 66ft. by 43ft., and about 48ft. to the ridge of the roof.

The Metropolitan Board of Works decided on Friday to erect a new fire brigade station for Holborn on a vacant plot of the Board's freehold land at the western end of Theobald's road.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The annual excursion of this association will be made to Wiltshire in the third week in August, the headquarters being at the ancient county town of Devizes. The proceedings will open in the town hall of the borough on the afternoon of Monday, the 16th prox., after which the County Museum, the churches of St. John and St. Mary, and the remains of the Castle will be visited. On Tuesday an excursion will be made to Potterne, where the church and several mediæval houses will be inspected, and the carriage drive will be continued through Erlestoke to Edington, where the priory church will demand attention. Bratton Castle, said to be the entrenchment of Guthrum the Dane, will be examined, and also the adjacent White Horse, while on the return journey the churches of Steeple Aston, Keevil, and Poulshot are to be seen. On Wednesday, Bishop Canning's Church, the Wansdyke, the Roman-road, the famous "Druidic" circle at Abury, and Silbury-hill, will be visited, and described by the Rev. A. C. Smith. On Thursday the members will proceed to Chippenham by rail, and then visit Bradenstoke Priory and Malmesbury, where the Market Cross, the Abbey, and Priory House will be inspected, and described by Messrs. Thos. Blashill, Patrick, and J. Reynolds. On Friday, Vespasian's Camp at Amesbury and Stonehenge will be visited, the return being made to Devizes across Salisbury Plain. On Saturday, Bromham Church, the Roman-road near Waushouse, Bowood, Lacock Abbey, and Melksham will form the programme. Monday and Tuesday, the 23rd and 24th, will be extra days, on the first of which Bedwyn, Chisbury Camp, and Ramsbury Manor will be taken, and on the second Savernake, the seat of the Marquis of Ailesbury and Marlborough.

Surrey Archæological Society.—The annual general meeting of this society took place on Wednesday last, 21st instant, at its council-room, 8, Dane's Inn, Strand. Major Heales, F.S.A., occupied the chair, supported by Messrs. C. H. Cooke, F.R.I.B.A, Ralph Nevill, F.S.A., A. J. Style, &c. The report of the council and balance-sheet of accounts were confirmed. Among other matters, the report regretted the death of Mr. Planché, an honorary member of the society. The retiring members of the council, the auditors (Messrs. J. T. Lacey and W. F. Potter), and the honorary secretary (Mr. Thomas Milbourn) were unanimously re-elected. It was announced that the annual excursion would take place on Friday, the 30th instant, to Farnham, Waverley Abbey, and Farnham Castle, under the presidency of the Right Rev. Bishop of Winchester. A vote of thanks to Major Heales for presiding closed the proceedings.

The Royal Archæological Institute.—The Archæological Institute holds its annual meeting at Lincoln this year, commencing July 27. On Tuesday afternoon, 27th, Mr. G. T. Clark will describe Lincoln Castle, and there will be excursions on Wednesday, 28th, to Gainsborough and Stow. On Thursday morning the architectural history of Lincoln Cathedral will be dealt with, and the building described by Canon Venables; and in the afternoon the question of the restoration of the west front of St. Alban's Cathedral will be the subject of a lecture by Canon Owen Davys, of Wheathampstead, illustrated by large drawings. On the evening of the same day the Bishop of Lincoln will hold a reception at Riseholme Palace. On Friday there will be excursions to Grantham, Sleaford, Heckington, Boston, and Tattershall; on Saturday to Newark, Hawton, and Southwell; and on Monday to Navenby, Brant-Broughton, and Somerton Castle. It is expected that the Bishop of Lincoln will preach in the cathedral on Sunday morning.

COMPETITIONS.

Glasgow.—As will be seen from an advertisement elsewhere, several of the designs for the new municipal buildings have been sent in with identical mottoes, thus rendering the task of the corporation a somewhat perplexing one. Mr. Charles Barry will proceed to report on the designs early next month, previous to which time the competitors who have used similar mottoes are requested to take the means pointed out by the corporation for their better identification.

SCHOOLS OF ART.

Newton Abbot.—There are several novel and important features in connection with the proposed establishment of a school of Science and Art at Newton Abbot, which will be ere long inaugurated under the presidency of the Earl of Devon. One of the difficulties in the way of popularising artistic and scientific education is that the appeal has generally perforce been made rather to the few than to the many, who prefer the *dulce* to the *utile*. And when the effort has been put forth, as has frequently been the case, to combine amusement with instruction, the result has generally been that by the severance of the two the desired result has failed of production, and that the amused are only partially instructed, though the instructed may more adequately have been amused. One of the chief features of the new Science and Art School which it is proposed to establish at Newton, and, indeed, its leading novelty, is the outcome of the experience and practical suggestions of Mr. John Phillips, the honorary secretary *pro tem.*, and it is this—the giving of public lectures on simple scientific subjects, in plain language, such as those in connection with the Twickenham Economic Museum, the South London Workingman's College, and similar Institutions, these lectures to be made additionally attractive by the introduction at intervals of vocal and instrumental music. This music, on the one hand, is to be provided by the students at the school, and on the other the scientific portions of the lectures are to be elaborated in class. In its practical bearing in connection with ceramic work it may, indeed, have very important results. Newton is in the centre of five potteries, all capable of producing art pottery, and affording facilities for such work. No place in the West of England, and few indeed anywhere, afford such facilities for producing faïence ware, accepting the present definition of faïence as a local pottery, produced from exclusively local material, for most of the pottery of the district is of this character. Nowhere, in fact, is there such a juxtaposition of the most important essentials, either for finer faïence than is made elsewhere, or for pottery generally, than is found in the neighbourhood. The original Faenza ware was coarse pottery of local clays. Finer, but corresponding, is the beautiful Vallauris ware, though there the material is chiefly hidden by the enamels; and finer still is the Lambeth faïence, made, however, not of local clays, but of Devonshire and other clays. Hence "Devonshire Faïence" would be as true a production as the original ware of Faenza; and there is no reason at all why the Newton School, with its special direction to this subject, should not produce art-workers, either among rich or poor, who could design or decorate equally with the art-workers, poor, in our sense, and uneducated, of Italy, Rhodes, &c. At all events, the effort is now about to be made under auspices which ought to command success.

School of Art, South Kensington.—In the concluding lecture of the present course on "Art History," Dr. Zerffi gave, on Tuesday last, some interesting statistics with reference to the growth of the attendances at these lectures. Dr. Zerffi, in 1869, commenced to lecture to an audience of seven. Since then he has delivered no less than 446 lectures, attended, on an average, by 70 persons, making a total of 31,220 attendances. Each lecture, if printed, would extend to about 32 pages 8vo., and the lecturer has thus furnished material enough to fill 20 volumes of 712½ pages each. The present course of 40 lectures was attended by 3,600 persons, making an average of 90 per lecture. This affords satisfactory proof of the gradual spread of the taste for the study of the historical development of art.

PARLIAMENTARY NOTES.

The British Museum.—Mr. D. Grant, on Tuesday, asked the right hon. member for Cambridge University, as one of the trustees of the British Museum, whether arrangements could be made for lighting the building so that it could remain open to the public until 10 o'clock at night. Mr. Walpole regretted that he could not give so favourable an answer as might be desired. The proposal to light up the museum had been before the trustees on more than one occasion; but they always found, on consulting the highest and best authorities, that the use of gas would be so injurious to some of the collections, particularly to the books and sculpture, and would be attended with so much danger of fire, that they had not seen their way to sanction its use. It was possible that the use of gas might be superseded by the electric light, which had been introduced into the reading-room, much to the advantage of students, who, during the winter, were allowed to remain until 7 o'clock. He was informed, however, that the experience obtained would not justify a more extended use of the light in other parts of the building, such as the exhibition-rooms and long galleries, because the means had not yet been discovered of imparting steadiness to the large number of lights that would be required. The trustees would keep their attention fixed on the matter, and would avail themselves of the earliest opportunity of making the desired experiment.

CHIPS.

At the Hampshire Midsummer Assizes, held last week, an action for alleged slander was brought by Mr. Richard Wallis, a justice of the peace for Basingstoke, against Mr. Simon Westcott, borough surveyor of the same town. The imputed slander was that plaintiff endeavoured to compound a felony, and defendant stated that he had mentioned the report, saying at the time that he did not believe it. Plaintiff eventually agreed to withdraw a juror, no apology being given by the defendant.

Some carelessness in tendering was revealed at the last meeting of the Woolwich District Board of Works. At the previous meeting tenders for 1,000 yards of stone were opened, the lowest being that of Messrs. Manuel at 11s. 3d. per cubic yard, and the next that of Messrs. Fennings at 11s. 11d. per ton. Messrs. Manuel now wrote expressing regret that by a mistake 11s. 3d. was written in place of 12s. 3d., and Messrs. Fennings to explain that for "per ton" should have read "per cubic yard." The clerk was directed to write to Messrs. Manuel asking if they were prepared to execute the contract at 11s. 3d., and should they reply in the negative to accept the amended tender of Messrs. Fennings at 11s. 11d. per yard.

A new coffee-tavern, adjoining the old town hall at Reigate, was opened by the mayor of that borough on Wednesday. Messrs. Apted Brothers, of Reigate, were the builders.

The new buildings of St. Kenehm's School on Cowley-hill, Oxford, were opened by Lord Elibauk on Tuesday.

A lofty obelisk, which was in course of erection on Tower-hill, Beaumaris, as a memorial to the late Sir Richard Bulkeley, suddenly fell on Monday, a number of workmen having a very narrow escape. The monument, which was to have been formally unveiled next week, stood in a very exposed situation, and the foundations are supposed to have been undermined by storms.

At the quarterly meeting of the Salisbury Diocesan Church Building Association, held last week, the following grants were voted:—Iron mission in Gigant-street, Salisbury, £25; restoration of Shapwick Church, Dorset, £50; restoration of Pitteu Church, near Salisbury, £50; and for new chapel-of-ease at Foxham, Bremhill, £100.

The churchyard of Temple Church, near Redcliffe, one of the poorest parishes in Bristol, has been converted into an ornamental garden, at a cost of £600, and was thrown open to the public on Tuesday by the Mayor of Bristol.

A Local Government Board inquiry was held at Brighton town-hall on Tuesday, before Mr. A. Taylor, inspector, into the proposal of the Brighton Town Council to borrow the sum of £6,000 for the erection of a fence along the Marine-parade. The borough surveyor explained the plans, which are for a fence 6,061ft. in length, from the Aquarium to Lewes-crescent; the fence will be of iron, on concrete foundations, with a painted top-rail. There was no opposition to the proposal. The Council have accepted the tender of Mr. J. G. B. Marshall, of Brighton, at £2,865, for the concrete, walling, and masonry.

The Paddington Poor-law Guardians, at their last meeting, held on the 14th inst., adopted plans prepared by their architects, Messrs. A and C. Harston, for the erection of a new infirmary for 256 inmates, on the workhouse grounds, and also a new laundry. The cost of the former will be about £100 a bed; of the latter, £4,000.

Mr. T. H. Wilson, architect, Norfolk-street, Sheffield, exhibited on Wednesday to the Ecclesall Board of Guardians draft plans for a new dining-hall for the workhouse. Mr. Wilson stated he estimated the cost of erecting the hall at £1,100, and that there would be accommodation for 500. It was resolved that Mr. Wilson should be instructed to complete the plans, and obtain estimates to be submitted to a future meeting.

Building Intelligence.

Bath.—A new vicarage house, in connection with Saint Luke's Church, Bath, has just been completed at a cost of over £2,000. The building is constructed of Bath stone, and covered with Bridgwater tiles. The whole of the work was carried out by Messrs. Hill and Gay, of Bath, under direction of the architect, Mr. Charles S. Adye, Town-hall Chambers, Bradford-on-Avon, Wilts.

Cardiff.—A large block of shops is on the point of being erected on the corner of Bute and Custom House-streets, Cardiff, for Mr. C. Kyte, at an estimated cost of £2,000. The lower part is intended to be done in Bath stone, while the superstructure is wholly of brick with the exception of a portion of the bay-windows, which is also of Bath stone. The facework is proposed to be of white brick, and the cornices, hood-mouldings, neckings, &c., being of red moulded brick, from the Pencoed Works. Mr. John P. Jones, 26, Park-street, Cardiff, is the architect.

Edinburgh.—Progress is being made with the work of providing accommodation for close upon 200 additional inmates at the St. Cuthbert's Poorhouse, Edinburgh, the walls of the wings which are to be added being now above the level of the first floor. After various schemes for the enlargement of the building had been considered, one of those submitted by Messrs. D. & J. Bryce, architects, was adopted and proceeded with. This mode of extension consists in the addition of a wing at either end in front of the edifice, the design and arrangement being, of course, in unison with the original design. The actual number of inmates for whom room will be made by the extension is 192, and the cost of the works contracted for is close upon £10,000.

Incorporated Church Building Society.—This Society held its last monthly meeting for the present session last week. Grants of money were made in aid of building new churches at Balbam, St. John, Surrey, £200; Northampton, St. Michael, £350; and South Westoe, near South Shields, £250; rebuilding the churches at Halstead, near Sevenoaks, £25; York, St. Lawrence, £200; enlarging or otherwise improving the accommodation in the churches at Caldmore, St. Michael, near Walsall, £30; Mounton, near Chepstow, £20; Plaistow, St. Mary, near Bromley, Kent, £40; Sancreed, St. Creed, near Penzance, £40; Seaborough, near Crewkerne, £15; and Timsbury, St. Andrew, near Romsey, Hants, £10. Under urgent circumstances the following grants formerly voted were increased towards building the church at Upper Holloway, St. Peter, Middlesex, from £125 to £150; and towards reseating and restoring the churches at Wormshill, near Sittingbourne, from £35 to £40; Tburning, St. James, near Oundle, from £40 to £60; and Haverfordwest, St. Thomas, from £30 to £50. Grants were also made from the Special Mission Buildings Fund towards building mission churches at Pensarn, in the parish of Abergele, £20; Higher Stoke, in the parish of Stoke Damerel, Devon, £15; Holloway, St. John, £30; and Portsea (Walton-road), Hants, £40. The society likewise accepted the trust of a sum of money as a repair fund for Minehead church, Somerset.

Lewanick.—The parish-church of Lewanick, five miles from Launceston, has just had its chancel restored. Lewanick Church, like most of its neighbours, is, in the main, of the Perpendicular type of Gothic architecture; but the Decorated doorway at its western end, and some other remains, are indicative of an older church, built probably upon the same lines at some earlier period. On plan the building consists of the western tower, a chancel, fine north and south porches, and a spacious nave and two aisles, joined the one to the other by arcades; the building is principally of granite, of a rough moor stone, very like granite, and of the well-known Cornish Polyfont stone. The most remarkable thing about the church is the miniature font-like stone that stands near the inner door of the north-west porch, and immediately against the adjacent seating. It is a cresset-stone, and its purpose and history were recently discussed in these pages, in which also it has been illustrated. The chancel-walls have been denuded of their many coats of whitewash, and the stones beneath have been pointed. The old plastered and stuccoed inner roof has been removed, and the waggon-typed shape of the original nave roof has been carried on right through to the east wall. The four-light east window has been faithfully restored. During the progress of the works an ogee-headed piscina was opened out in the east wall, and a most interesting old two-light window, altogether blocked up, was discovered in the south wall and within the sanctuary. This, too, has been opened out and restored, and filled with stained glass. The floors are laid with encaustic tiles of quiet design by Messrs. Maw and Co., of Broseley. The old altar-rails, which were of a Jacobean type, have been modified and refixed. The altar is new, and of English oak. A reredos has been erected, of Bath-stone, a parallelogram in form, and surmounted by a carved and pierced cresting. Immediately over the altar are sculptured representations of the four Evangelists, and at either side are panels, in which are carved lilies in pots. The east wall has been mainly rebuilt and pointed, and a coping of Portland stone added to the gable, surmounted by a foliated cross at its apex. The outer roofs have been cared for, and a crease of red Berkshire tile put upon the ridges. The works have been carried out by Mr. Harry Hems, of Exeter, under the personal superintendence of the Rev. Charles H. Archer, the Vicar, who is a great-grandson—maternally—of Sir William Chambers.

Manchester.—The foundation-stone of St. Clement's Church, Denmark-road, Greenheys, Manchester, was laid on Saturday. The new building will be in the Early English style, and will consist of chancel, nave, north and south aisles, with organ-chamber, and clergy and wardens' vestries. The total length of the church will be 126ft. 6in., and the breadth across the nave and aisles 61ft. 9in. It is intended, in course of time, to erect a tower and spire at the west end of the north aisle, but for the present that part of the work has been abandoned, owing to the want of sufficient funds. Accommodation will be provided for 750 worshippers. The contract has been let to Mr. Herd, Polygon-place, Ardwick, for the sum of £4,392, and the church will be erected from designs by Mr. H. R. Price, architect, 25, Cross-street, Manchester.

Scarborouoh.—The new church of the Holy Trinity, Scarborough, was opened last week. The church consists of a nave and chancel without break, and of equal width, 30ft. between the walls; terminating at the east end in a semicircular apse—a north aisle, about 17ft. wide, overlapping the chancel—and a porch, forming the basis for a future tower, at the north-west angle of the nave. The internal length of the nave and chancel is about 108ft., and the entire width of the building when finished will be 73ft. inside. The material used for the walling is grey Hackness stone laid in random courses, with masonry and dressing of freestone. The roofs are of Baltic fir and pitch pine, covered with Westmoreland slates. The style adopted is, generally, that of the thirteenth century, treated in a simple manner, and with little ornament. The church has been erected from the designs of Mr. Cbristian, by Messrs. Padbury and Son, Scarborough.

Sheffield.—The Central Schools, which, with the Firth College and School-Board offices, form a conspicuous group of buildings in Leopold-street, were formally opened by Earl Spencer on Thursday, the 15th inst. A perspective view of the building, with description, appeared in the Building News for Oct. 17th last year. They were designed by Mr. Flockton, of Sheffield, in conjunction with Mr. E. R. Robson, F.S.A., of London, in a Free Classic style, and have been erected by Messrs. W. Bissett and Co., of Sheffield, Mr. J. Laidler, of London, acting as clerk of the works. The facing material throughout was Huddersfield stone. The schools are the last section of the undertaking to be completed. In the basement of the parallelogram are placed a school of chemistry 20ft. by 22ft., and a laboratory 39ft. by 20ft., and a joiners' shop, the heating apparatus chamber, which is 84ft. in length by 5ft. wide; it contains apparatus by Mr. D. O. Boyd, of London, which heats the whole building by 20 tiers of pipes, the air being clarified before admission into the chamber by passing through wetted canvas. On the ground-floor are a school for cookery 20ft. by 22ft., with scullery, a junior mixed school for 233 children, an infants' school for 133, a babies' room, deaf and dumb school for 48, gymnasium, and several class-rooms. In the mezzanine are teachers' rooms, lavatory, and caretakers' apartments. The first floor is divided into eight class-rooms, each for 48, rooms for the head master and mistress, and a library, and over this is a general hall 86ft. by 34ft. The cost of the entire range of buildings—the College, the School Board offices, and the schools, including furniture, architects' commission, &c., but exclusive of land, amounts to about £70,000. Of this amount £20,000 is for the erection of the College, the cost of which is borne by Mr. Mark Firth.

Standlake, Oxon.—The restoration of the parish-church has just been commenced. The gallery and high pews have been cleared out, the floors renewed, and the roof of the nave taken off. It is proposed to completely restore the nave this year, to renew its roof and floor, to scrape, point, and repair its walls, and to provide sittings for 200 persons. The contract for this portion of the work has been taken by Mr. Barnes, builder, of Witney, at £1,581. It has been decided that the restoration of the whole church shall be divided into five sections, which will be carried out as funds permit, as follows:—(1) the nave, now in progress; (2) north aisle and its transept; (3) south aisle and its transept; (4) tower and porch; (5) the chancel.

Stoodleigh.—The parish-church of St Margaret, Stoodleigh, which has been restored and enlarged, was reopened by the Bishop of Exeter on Monday week. A new chancel, 30ft. in length, with south chancel aisle and porch, has been added; the new walls have been built of local stone laid in random courses, the dressings being of red stone from Ford. Internally the walls are lined with brick, and finished with a warm stucco. The reredos is of Devon marble and Bath stone. The internal roof of nave has been restored, the south arcade taken down and rebuilt, and in the south aisle the windows put in seventy years ago have been replaced by others in character with the prevalent style of the church. A new pulpit of moulded and traceried work has been erected in Bath stone; the font has been placed on a raised stone base, and fitted with a high wooden cover, and the tower-arch is filled in with a low moulded screen. The windows of chancel-aisle and that at east end have been filled with stained glass by Messrs. Hardman, of Birmingham. Mr. H. Woodyer, of Guildford, was the architect; Mr. Wood, of Lurleigh, the builder, and Mr. Redfern the clerk of works.

Sydenham.—The new church of St. Matthew's, Panmure-road, Sydenbam, has just been consecrated. The church, when completed, will consist of chancel, with choir vestry and parish room under; south chancel aisle, with churchwardens' vestry under; organ chamber, with clergy vestry under; nave and aisle, four arches in length, that is, 72ft. 6in. long and 55ft. wide, the height to the wall plate being 35ft. 6in., and to the ridge, 62ft. 6in. The nave and chancel will be under one continuous roof. Entrances are provided by porches in the north and south-west corners of the aisles. The font will be placed in a specially designed baptistry in the middle of the west wall of the nave, and the bells will be carried in a bell gable over the chancel arch. At present there have been built the chancel, with vestries beneath, two bays of nave, covered in at clerestory level by a temporary roof, and the aisles to same, which have permanent roofs. The style of the church is Early English Lancet. In material the church is very simple, being mostly of yellow stocks relieved with arches and bands of red bricks. The builders, who have creditably carried out their work, are Messrs. Lathey Brothers, of Battersea; and the architect is Mr. J. E. K. Cutts, of Soutbampton-street, Strand.

The Scottish Corporation.—On Wednesday the Duke of Argyll opened the new hall of the Scottish Corporation, built on the site of the old one in Crane-court, Fleet-street, which was destroyed by fire in November, 1877. Professor Donaldson is the architect. The new block of buildings consists of three stories; there is a spacious chapel for the congregation of pensioners on pay-days, and the religious service on those occasions; the hall for the meetings of the governors is 43ft. long by 18ft. wide, and 16ft. high; at the east end of the hall there is a handsome white marble chimney-piece, resembling that at Craigievar Castle, Scotland, which was saved from the conflagration; and adjoining it is a committee-room, 19ft. long by 15ft. 6in. wide. The architect, wishing to infuse into the building as much as possible of national sentiment, has largely adopted in the ornamental details the lion rampant, the thistle, and similar emblems. The estimate for rebuilding was £5,778.

Tiverton.—The memorial-stone of the new school-building at Horsden, for Blundell's School, was laid on Saturday week. The site consists of about 20 acres, and the new building will accommodate 250 boys. The cost of the whole is estimated at about £15,000. The new building has been designed by Messrs. Hayward, of Exeter, and the contractors for the work are Messrs. Langdon and Poole, Minehead. In style the new school will correspond with the old one, but the interior be considerably different. The large room will be 66 by 30ft. and have a handsome open-timbered roof, and the class-rooms, six in number, will vary from 31 to 24ft. in length and be generally 20ft. wide and 14ft. in height. The entrance will be through the tower, which is at the north-west angle of the building, and over the doorway will be a niche for a statue of the founder. A second external doorway in the tower is intended to form an approach to a chapel, which it is hoped will be soon erected. The accommodation for the Head Master will be convenient and have kitchen offices sufficiently large for taking boarders, but no further provision is made for them in the present contract. The north porch of the building will be 108ft. in length, and the extreme length from north to south, including the head master's house, will be about 224ft. The whole building will be erected with Holberton stone, with dressings of Doulting stone.

Wakefield.—The West Riding Bank premises in Wood-street and Silver-street are about to be rebuilt from the designs of Messrs. J. Neill and Son, of Leeds. From a lobby, 10ft. by 7ft. 9in. with oak dado, panelled ceiling, and mosaic floor, will be entered the banking-room, which will be 40ft. by 30ft., and 16ft. 6in. high, and will have panelled ceiling, tiled floor for the public, and also seating, and will be fitted up with desking, tables, counter, screens, and dadoes, all of figured old English oak. Entered from this room are the strong-room and the clerk's dressing-room. Separately approached, but with the banking-room, the clerks and the counter in view, will be the partners' room, and the consulting-room both fitted and furnished in oak, and a private staircase leads to ledger-room, dressing-room, and lavatory. Partly over bank and with a private entrance from Wood-street is the manager's residence, the first floor being divided into a drawing-room, 24ft. by 17ft., seven bed-rooms, and bath-room. Cellarage is provided under part of the house, the cellars under the bank being filled in solid and covered with concrete. The house department and the bank will be kept separate by fire-proof walls and floors. The elevations will be Queen Anne in character, the whole being carried out in specially made small selected bricks, with Bradford stone dressings. The bank will be enclosed with Burnett's steel thief-proof shutters; the main entrance doors will be lined with steel in the middle, and have a strong ornamental wrought-iron grill in the fanlight. The premises will be built detached, and windows at the back near the ground will be defended by wrought-iron bars, built in. The contracts have been let to Messrs. J. and W. Beanland, of Bradford, and to Mr. J. C. Tattersall, plasterer, of Wakefield.

Wordsley, near Stourbridge.—New offices, seed warehouse, and a manager's residence, are being erected by Messrs. Webb and Sons, at their extensive seed establishment, near Stourbridge. The former comprise on the ground floor an entrance-hall and staircase, with general waiting-room attached, a ledger office 60ft. by 24ft., with manager's office at one end, fire-proof room, cloak-room, and lavatory, and a private staircase to the upper floor, on which are arranged a suite of offices for the Messrs. Webb and the heads of the several departments, together with sample-room, cashiers office, and a spacious reading-room and library for the use of the employés, which is approached from the entrance-hall by a handsome staircase of polished pitch pine. The seed warehouse is in continuation of the present extensive buildings, and is five stories high, each floor having an open space of 88ft. by 40ft., comprising on the basement, potato and root stores; on the ground floor, clover-seed stores; second floor, vegetable and flower-seed department; third floor, mangold-seed stores, with a general store on the upper floor. The buildings are being carried out by Mr. Lovatt, from designs prepared by Mr. J. R. Veall, architect, of Wolverhampton. The materials used are red pressed bricks with Hollington stone dressings, at a cost of nearly £7,000.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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Correspondence.

UNDERWRITING DWELLING-HOUSES.

To the Editor of the Building News.

Sir,—"Architectus" in your last number asks why inspectors or supervisors of buildings cannot act as efficiently in the direction of our dwellings as Lloyds' surveyors operate in overhauling the materials, and the mode by which they are combined, in the construction of steam and sailing vessels. In building vessels the materials used are either wood or iron, but, in modern times, more especially the latter. The form in which the one and the other is supplied to ship builders admits of its being readily tested, and thus far the surveyor from Lloyds' duty is a simple one. The punching and drilling of the necessary rivet-holes, and the fashioning of the various parts of a well-planned ship is a kind of work performed in open day, and capable of the most facile scrutiny and examination. Moreover, all engaged in the business have an interest in producing the best quality of work, for unless the experienced surveyor representing Lloyds can favourably certify, the costly vessel would be practically valueless, for without a clear classification at the fountain head in London, it neither could be insured nor expect, unless under disadvantageous conditions, to be used to carry cargo.

I see no practical difficulty in the organisation of a protective body to supervise the erection of houses; but, under existing systems, or rather want of systems, the thing is all but impossible. There is plenty of machinery, in all conscience, but it requires remodelling. The Metropolitan Board, with their highly-paid staff, take especial care of the numbering and naming of our streets, and perform, no doubt, to their own satisfaction, a large amount of routine red-tapeism; but they are helpless, and stand by in the most ridiculous manner, permitting the use of improper materials in buildings intended for human occupation. This body, which ought to be the Lloyds' or safety beacon to avert danger in our streets, in their wisdom resell, or rather let, the surplus lands which come into their hands on short leases, and thus encourage the erection of indifferent or dangerous structures.

One would imagine, after the perusal of a modern fashionable building specification, that its framer and the concoctor of its details had the most perfect knowledge of the materials on which that document so glibly descants. If, however, you take the trouble to follow up the work it pretends to control, you will, in the majority of cases, find that the whole thing is a mere sham, not so much from the desire to do wrong as from the incapacity to do right. A clerk of the works is, as a matter of course, appointed, whose duty is supposed to be of a protective character; but even the most experienced of that class is unable to cope with the difficulties with which, even in an ordinary building, he his surrounded. Unfortunately, in these times both engineer and architect prefer the luxurious office to the building they have undertaken to construct, and have no pride in looking after the details on the ground—unlike, in that respect, Wren and Smeaton, the former of whom, it may be safely affirmed, knew every stone in St. Paul's, and the latter had an equally intimate acquaintanceship with every member in the scheme of his great work, the Eddystone lighthouse.

Mr. Cresswell, I think, must move first in the direction of testing all the materials used in building; but before that can be done available means must be at hand for that purpose. We have no such means of examination in this country, and those building materials which are now challenged are only submitted to some arbitrary or rule of thumb examination.

The tenure of land on which the houses are to be built should also be considered; otherwise, good and durable houses, like those of Glasgow, for instance, would not be erected on a lease determined at a comparatively early date.

No underwriting could be found to operate on bad or *diseased* houses, as it is, at present, impossible to get risks written against non or badly-classed ships. There would be a great desire to occupy houses which had a clean bill of health, and guaranteed against those dangers and risks consequent on bad materials and defective construction. Let us hope for an early realisation of that "good time coming."—I am, &c.,

Civil Engineer.

IRON-FILINGS IN CEMENT.

Sir,—I might apply the old adage "that a man convinced against his will, is of the same opinion still," to your correspondent "Magnet," who will insist upon it that Pertland cement contains a considerable percentage of "free iron." I admire his pertinacity, and believing that he is most conscientious in his views, I shall take the trouble of examining a variety of Portland cements from different districts in England, Scotland, Ireland, and Germany, and ascertain to what extent the presence of iron exists. There has been too much quasi-authoritative "burking" of cement inquiry, and "Magnet" and every other experimenter should be assisted and encouraged in his investigation. I hope in your next number to produce the results of my search for "free iron" in Portland cement from widely separated districts, and produced from a variety of raw materials.

"Magnet," in his anxiety to maintain his point, jumbles up in the most confusing manner the information which I thought I had clearly given. The bolts, nuts, or other pieces of iron whose presence in the cement I attribute to accidental causes, are unavoidably introduced into cement works through the agency of the coke, and I have no doubt also that a considerable addition is made from carelessness on the part of the makers themselves. Their being challenged by the miller when passing through the millstones is quite an economical question, and if the workman in charge of this department of cement industry is paid by the ton for grinding the cement, he could not afford to stop the whole machinery and occupy, perhaps, an hour in removing the foreign substance. He knows from experience that there are cement consumers to be found who neither use sieve, testing-machine, nor even common sense, and confidingly take cement so long as it is in a cask and sack with a maker's name labelled thereon.

Iron in chemical combination in *cement* is prejudicial, and iron in a compound mixture (cement and iron) need not be for mortar or concrete purposes injurious. It is not so long ago that engineers specified a certain proportion of iron-filings in mortar and concrete preparations. Indeed, within the last ten years, a very important bridge was built in Scotland under such conditions in the specification.

The detection of iron by the aid of the magnet is not new, for the practice has existed for a long time in the porcelain industries of this and other countries for purging clays and prepared granites of the metallic impurity which would seriously endanger the quality of the ware. At Beleek, in Ireland, where the famous porcelain of that name is produced, the reddish orthoclase granite is first calcined, thus becoming white, and when the powdered clay so obtained is mixed with water, magnets are introduced to extract the iron, which, if allowed to remain, would damage the porcelain, which is of the purest white colour when ready for market. Even, however, should it be found that "Magnet's" views are correct, the danger to be apprehended from a moderate mixture of "free iron" in cements cannot materially damage any compound with which it may be incorporated.—I am, &c.,
Henry Reid.

21, Arundel-street, W.C., 19th July.

Sir,—Referring to "Magnet's" question as to the origin of the metallic iron which frequently occurs in Portland cement, there is, I think, little doubt that it is produced in the kiln in which the cement is burnt. The temperature in a cement-kiln is amply sufficient for the reduction of metallic iron from its oxides, and these oxides exist not only in the raw cement mixture, but are also present in considerable quantity in the coke used for burning the cement. Whether they are derived in the latter case from the ferruginous shale, or iron-pyrites in the coal used at the gas works, does not affect the question at issue.

If "Magnet" can procure some pieces of heavily-burnt cement clinker, he will not be long in detecting the presence of metallic iron if he will treat them in the following manner:—Grind one or more sides of each piece of clinker on a grindstone and immerse in a dilute solution of sulphate of copper (blue vitriol). Should any globules of metallic iron be inclosed in the clinker they become coated with copper and can easily be detected with the naked eye.

I first found free iron in cement clinker in this manner about six years ago, and have since met with it frequently, not only in cement clinker and ground cement, but also in clinkers from furnaces and clinkered bricks.

Like the sulphides present in cement metallic iron generally escapes the notice of the analyst, owing to the method of analysis usually adopted. I may add that the highest proportion of free iron I have found in cement clinker was three per cent.—I am, &c.,

Brixton, July 21. Walter F. Reid.

LIGHT AND AIR—LAYBOURN v. KIDSTON.

Sir,—As I was engaged in this case, I trouble you with a few remarks in reply to Mr. Tomlinson's letter, which appears in this week's issue. First, he implies that only one surveyor was employed on the defendant's behalf, the fact being that, in addition to Mr. Hovenden, the late Mr. Robert Hesketh and myself were called in, and, after carefully inspecting together both the plaintiff's and defendant's premises, advised that there was no substantial injury to the plaintiff's light. Further, Mr. Eason, of the firm of Messrs. Reynolds and Eason, also inspected both premises, and gave his opinion that the letting and selling value of the plaintiff's premises was not affected.

In justice to Mr. I'Anson I state this, and I am sure your readers are likely to accord more weight to the opinion of Mr. Hesketh, whose loss we all deplore, and whose calm judgment, great experience, and careful and exhaustive reports induced the Judges and masters in Chancery so often to refer cases to him than to Mr. Tomlinson, against whom I have not one word to say, except his youth, for we cannot expect mature judgment without the unpleasant accompaniment of age, and those of your readers who do not know him would, I fancy, certainly, from his passionate attack on a gentleman who stands in the front rank of our profession, imagine him to be one of those in whose veins runs the "hot blood" of youth.

If I could spare the time—which, just now, is so much occupied—I could explain the fallacy of the description Mr. Tomlinson gives, and how it is that the angles of 60deg. and 73deg. are misleading; but, probably, it will be sufficient to answer his statement as to *common sense*. He says the decision seems to him to be out of all reason, either with the laws of light or *common sense*.

I do so simply by giving an extract from my report:—

"I commenced by going upstairs to the attic, as it is stated that the light to one of the dormer windows was affected by the back wall of the main building of the defendant's premises. I found that this room has sloping sides, that this window consists of a fixed sash of small size, being (glass measured) 2ft. 5in., by 1ft. 9in., and an indication that the light is more than sufficient is afforded by there being a shelf right across the sash, and this shelf and the goods thereon naturally exclude light.

"To *test* the value of the light from this (now darkened, as alleged), we covered the other more important window with a great coat, and we could read at the end of the room farthest from this window small-type labels on the goods, as, for example, the words 'warranted to keep its shape and colour.' The size of the type was 1-24th only of an inch long. I also tested by reading the smallest type in the *Times* of that day's date. The only corner affected was the north-east corner, but this was a natural result, as, from the shape of the room, this corner can only be lighted from the window fronting Artillery-lane.

"Next we screened in a similar manner the west window (the window stated to have its light injured), and the result was that there was scarcely any difference in the quantity of the light. (Note.—These tests occurred at about twenty minutes past three, the day being dull and cloudy).

"We next descended to the *second floor*, where a light which lighted a passage-way, 9ft. 6in. long by 7ft. wide (and which is fitted up with shelves and used for storing goods) was good, and I did not consider that the building on the opposite side of Artillery-lane, Messrs. Boor and Co.'s—although it (and not the defendant's building) does obstruct some rays of light—appreciably affected the lighting of this passage.

"We next ascended by a different staircase, and so arrived at the passage over that last-mentioned, and here the light was good, and the remarks apply about Messrs. Boor and Co.'s premises as in the preceding paragraph.

"We next descended to the *first floor*, and here is the borrowed light. The size of this portion of the first floor is 9ft. 6in. by 7ft. 6in., and it has three doorways leading to other portions of this floor. The lighting is by a skylight over the bulkhead, having rough plate-glass therein; the light then passes through two glazed openings, 1ft. 9in. by 1ft. each, and through another opening 3ft. 6in. by 2ft. 1in. (outside glass measure, as the sash bars dividing this opening into four panes are measured in) I noticed the goods (coal-scuttles and scoops) against the wall, and the light appeared sufficient; but I thought perhaps the light may have been greater before the defendant's building was erected: how can I test this? and I mentioned to the other surveyors I considered this might be easily done. There are three large rooms on this floor, and a portion lighted by the very large skylight, which, it is admitted, has not been affected by the defendant's building operations. My suggestion was adopted, and we walked round and looked at the goods on other stands, and in other cases, and I am bound to say could not distinguish them more clearly. *I cannot imagine a fairer test than this, because being at the same time, no question of the dulness of the day, or the hour of the day, could be raised.*

"With regard to the lavatory in this (first) floor the roof of which is glass, the light is excellent, and I could not imagine why, with such a strong light on the floor the glass panel therein had been boarded over in the shop, as if the boarding was removed the light to cashier's desk would have been greatly increased. (Note.—I imagine the original object of this glass in the floor was to give additional light to the cashier's desk.)

"Next we descended to the *ground-floor*, and the first thing I looked for was the light to cashier's desk, with the result mentioned in preceding paragraph, namely, that it had been boarded over to prevent light having access.

"The next was to test the deep shadow on the counter mentioned by Mr. Warman Thorn in the affidavit of 26th June, 1879. The gas in shop being alight, we had it put out, with the advantage of the evening twilight casting the shadow more distinctly, and I found the whole counter in full light, and the statement therefore, of Mr. Thorn is not supported by the fact.

"After the survey of the whole of the plaintiff's premises, I am of opinion that practically the lighting for all the present purposes is amply sufficient, and that the rental value is not affected; of course, I exclude the increased value caused by the defendant's modern and attractive new building, as that must not be taken into account in this action."

Surely *no impartial* person can read this extract without saying that at least Mr. I'Anson's award is in accord with *common sense*.

One other point I crave leave to allude to, so as to calm the fears of your numerous readers and prevent panic. Mr. Tomlinson says: "After the decision given lately by Mr. I'Anson in the case of Laybourne v. Kidston, I am afraid that what works are now published on light and air are of little value."

I assure them that the decision is in accord with the legal decisions, and therefore with my work on "Light and Air," which they may still read without any misgiving.—I am, &c.,
Banister Fletcher.

THE OBELISK ON THE EMBANKMENT.

Sir,—Passing by *the* Sphinx temporarily located by the Needle on the Embankment, I noticed on its face an intense expression of amused scorn, that I am sure was not there when I saw the model in the studio of its clever and admirable sculptor (Mr. Mabey). I can only describe it as equivalent to that pourtrayed on the visage of the noted two Augurs behind the scenes in the Greek temple.

The comparison in this case is yet to come. It, and its fellow, should be placed face to face, when I wager a wink will be found in the eye of one, or both of them.

Now it is obvious that Mr. Mabey would never have dared to introduce this piece of comedy, commissioned, as doubtless he was, by the solemn and august Metropolitan Board of Works.

I can only assume that somehow the Sphinx has read the correspondence on the subject of his connection with the real Egyptian obelisk in your pages, and has come to a fitting conclusion as to the absurdity of his own existence and position. In conclusion, I am only afraid that should the expression that has so struck me strike others likewise, there will certainly be a crush on the Embankment next Sunday, of which pickpockets might take advantage, and therefore it is as well that timely notice should be given to the police. That, Mr. Editor, I leave to you, and feeling calmly conscious of having done my duty in the matter,—I am, &c.,

John P. Seddon.

P.S.—Of course, as all the world knows that artistic rules required that the animals should have been placed *vis-à-vis*, that, in violation of them, the Sphinxes are to be *dos-à-dos*, is doubtless a concession to expediency, and out of fear of some such catastrophe as that which has happened. The usual combination of the wisdom of serpents and harmlessness of doves is evident in this, as in all other transactions of the honourable Board.—J. P. S.

1, Queen Anne's Gate, Westminster, S.W.
July 22.

BUILDERS AND THE EMPLOYERS' LIABILITY BILL.

Sir,—I beg to inclose you a list of objections raised by the builders of the United Kingdom to "The Employers' Liability Bill, 1880," now before the House of Commons (in Committee), and would ask the favour of your finding space in your valuable Journal for notice of the same.—I am, &c., E. S. Henshaw, Secretary.

The Central Association of Master Builders of London, 27, King-street, Covent-garden, W.C. London, 22nd July, 1880.

1. That while many other clauses of the Bill are open to objection, Sub-clause 3 of Clause 1 is the most objectionable, as the one which entails the greatest hardship upon employers, and especially those engaged in the Building Trade.
2. That the Master Builders of the United Kingdom employ a larger number of hands than are employed in any other branch of industry proposed to be affected by the present Bill.
3. That in the business of a Builder a very large proportion of the persons employed throughout the various departments comprised in such business, are persons who are of necessity in the position of some authority. The general foreman exercises authority over the other foremen, and these again exercise authority over those beneath them, and so on in a descending scale, until at last the person exercising authority is often a workman, and a workman in a comparatively humble grade: thus each bricklayer has working with him a labourer, who is expected to conform to the directions of such bricklayer, and the effect of Sub-clause 3 will therefore be not only to render the employer liable for the negligent acts of his general foreman, and his other foremen, but also for the negligent acts of all his bricklayers, whereby the labourers working with such bricklayers sustain injury.
4. That the above case of the bricklayer and labourer is given simply by way of illustration, but in a large Building business the persons who exercise authority, such as the bricklayers, may be counted by hundreds, and yet each of such persons will, by reason of Sub-clause 3, be in a position to render his employer liable to the payment of heavy damages.
5. That it appears from the observations of the Right Hon. George Dodson, made on moving the second reading of the Bill, that the object and scope of the Bill was only to render the employer liable for the acts of a person "to whom the employer distinctly delegates his own authority."
6. That the definition introduced into the Bill, as amended in Committee, "of a person who has superintendence entrusted to him," is in accordance with the object of the Bill, as so stated by the Right Hon. John George Dodson.
7. That Sub-clause 3, as above pointed out, goes much further, and neutralises the effect of the definition clause, which limits the liability of employers to cases of negligence of persons who are not ordinarily engaged in manual labour, and thereby (so far at least as Builders are concerned), almost abolishes the defence of common employment.
8. That at any rate Sub-clause 1 of Clause 1, which renders the employer liable for certain defects in machinery, &c., meets the only case left uncovered by the definition clause, which, it can reasonably be argued, ought to be provided for.
9. That it is therefore just and expedient that Sub-clause 3 should be omitted from the Bill, which will thus be brought more into harmony with its intention, as already declared by the Right Hon. John George Dodson.
10. That if sub-clause 3 cannot be omitted altogether, and it is thought necessary to render the employer liable for the acts of any other persons besides those who have "superintendence entrusted" to them, and those who will be in a position to render him liable under sub-clause 1 of clause 1; the Bill should at any rate more accurately specify and limit the other persons who it is intended should render the employer liable under sub-clause 3.

Benjamin Hannen,
President of the Builders' Society.
Geo. F. Trollope,
President of the Central Association of London Builders.
Stanley G. Bird,
Vice-President of the National Association of Master Builders of Great Britain.
London, 20th July, 1880.

ST. PAUL'S CATHEDRAL, MELBOURNE.

Sir,—The perspective which you have published this week from the *Australian Sketcher* of the cathedral at Melbourne, is so very incorrect and misleading, that I must ask you to allow me to disavow the intention of building anything so very commonplace. I am sorry that you did not apply to me to verify this Australian picture, which is singularly unlike the working drawings which are now completed.

Everybody who knows my work will know that I never bury a gas-pipe below the floor, nor use standard lights among seats, as here represented. But this is only one of many inventions and omissions. To my eye, the drawing is at best, a very weak caricature.—I am, &c.,

W. Butterfield.

[The description which accompanied the illustration in the *Australian Sketcher* seemed to have been published with the authority of the resident architect, and we thought the engraving sufficiently good to reproduce. Of course, a wood engraving never is a thoroughly satisfactory representation of an architectural work, and an artist like Mr. Butterfield would at once detect defects and inaccuracies which would escape general notice. The only one, however, which he mentions specifically is hardly a very serious matter.—Ed.]

SUNDAY ART EXHIBITIONS.

Sir,—We have the pleasure to announce on behalf of the Sunday Society that, in addition to the Sunday opening of the Grosvenor Gallery, the Society has arranged for opening the Annual Exhibition of the Society of British Artists at Suffolk-street, Pall Mall, East.

Both exhibitions will be open to the members of the Sunday Society on Sunday next, July 25, and the public will be admitted on the following Sunday, August 1, by means of tickets, which will be forwarded to all who make written application and send stamped and addressed envelope to the Honorary Secretary, 6, Dudley-Place, W. On each Sunday the Gallery in Suffolk-street will be open from 4 till half-past 6, and the Grosvenor Gallery will be open from 6 till half-past 8.

In order that these opportunities for intellectual recreation on Sunday may be as widely known as possible, we beg you to insert this letter in your columns.—We are, &c.,

Dunraven, President.
Mark H. Judge, Hon. Sec.
9, Conduit-street, W., July 20, 1880.

CHIPS.

Mr. F. J. Evans, for many years engineer, and latterly a director, of the Chartered Gas Company, died somewhat suddenly last week. He designed and superintended the erection of the gigantic gasworks at Beckton.

The foundation-stone of a new wing of the National Hospital for the Paralysed and Epileptic was laid on Wednesday. The new wing, which was illustrated by a perspective drawing in the Building News for January 9th last, is intended to form the initial portion of a new hospital, and will provide out-patients' wards for eighteen additional male patients, and other much-needed accommodation. The architect of the new building is Mr. M. P. Manning; the contractor, Mr. W. Brass. The estimated cost of building and furnishing is £9,000. The hospital is situate in Queen's-square, Bloomsbury.

A new church was consecrated, on Tuesday, at Simonside, near Tyne Dock. Mr. Johnson, of the firm of Austin, Johnson, and Hicks, Newcastle, was the architect, and the style is Gothic, of the latter part of the 15th century.

The memorial-stones of a new Baptist chapel, now being erected at Markhouse Common, Walthamstow, were laid, on Tuesday last. The building is of Gothic design, and will accommodate 550 persons, at a total cost of about £2,000. Mr. John Edward Sears is the architect, and Mr. Allen, of Kilburn, is the contractor.

The town council of Congleton have accepted tenders from Mr. Thomas Scragg, of Buglawton, and Mr. Thomas Kirk, of Biddulph, for the construction of waterworks for the supply of the borough. The total cost will be about £12,000.

The town council of Newcastle-under-Lyne have opened negotiations with the gas company for the purchase of their works and undertaking; and the shareholders of that company met last week and agreed to the price to be asked.

Memorial-stones of a new chapel and school were laid on Wednesday week by the Wesleyans of Lostwithiel. The chapel will be Early Gothic in style, with a central gable flanked by pinnacles at the end facing street, and at the junction of chapel and school will be a tower and spire. The chapel will be 57ft. by 34ft., and will seat 225 persons; the school will accommodate 150 children, and the total cost will be £1,750. Mr. J. Hicks, of Redruth, is the architect; and Messrs. Philp and Brown, of Lostwithiel, are the builders.

An animated debate took place at the Poplar district board of works on Friday, with reference to a committee's recommendation to pave Burdett-street, Bromley, with York stone, at a cost of £540, the alternative tender being for Victoria stone at a cost of £520. On a division, it was decided to accept the latter tender, and use the patent stone.

Intercommunication.

QUESTIONS.

[6170.]—**Wood-Engraving.**—Could any one give me the name of a good book on wood-engraving? A hand-book or manual is what I want.—B. M.

[6171.]—**Perspective.**—Could any of your readers inform me if there is a 3rd grade examination in perspective held at the South Kensington Schools, and if so in what respects it differs from the 2nd grade, in which latter I have gained a prize, and wish to follow on the subject?—Colcestriensis.

[6172.]—**Contracts.**—Would some reader be kind enough to give the names of a few books on the laws relating to contracts in connection with buildings? Such as are accepted as standard works by London architects and builders are desired.—J. J. M.

[6173.]—**Damp in Walls.**—Will some reader kindly inform me of the best method for preventing damp in walls defacing the paper, without cutting away the brickwork?—Trudge.

[6174.]—**Commission.**—An architect arranges verbally with a client to carry out the whole of a large job, at a percentage somewhat less than usually charged, which, under then existing circumstances, he could afford to do. When the first contract is complete, about two-thirds of the work, and the most troublesome portion of it, the client decides to finish the matter himself, and discharges the architect. Is not the architect entitled to 5 per cent. upon the amount of the first contract, also to a charge for preparing drawings and specifications, and obtaining estimates, &c., for the remaining portion which the client intends to carry out himself, and, if so, how much?—Q.

[6175.]—**Rot in New House.**—A substantial villa, costing over four thousand pounds, was built between two and three years ago, and although fairly well ventilated, on opening it up the whole walls below level of sleepers, as well as underside of flooring, were covered with a wet spongy fungus, white and downy in some places, and having the appearance of shoe leather at others. The growth has penetrated quite through the walls, both stone and brick, and, indeed, on breaking the hardest bricks is seen growing in their very centres. The flooring was perfectly rotten, and, of course, had to be renewed, and although both it and the wall have been coated with sulphate of iron, corrosive sublimate, hot lime, &c., the fungus still breaks through as lively as ever, and we fear the operation of gutting out will be required again very shortly. The house is built between two others, with narrow passages at both ends, on a soft rotten sandstone, with a considerable declivity on the street front, the sleepers being level with the ground at one end and about 5ft. above at the other. I may also mention that the sleepers were first-class pitch pine, and that the whole ground-floor was deafened in the usual way for purposes of warmth. Perhaps some gentleman who has seen a similar case will give his opinion and experience of the matter and oblige—James R. Mudie.

[6176.]—**Drain-Pipes.**—Is there any rule or stated way, according to our sanitary laws, how drain-pipes are to be put together? As I am foreman to a builder, I was sent to a gentleman's house in one of our most respectable neighbourhoods in the metropolis to find out the cause of sewer-gas in the house, as there was great offensive smells, and people suffering from sickness stated to arise from this cause. After excavating the earth over the main drain I found the crown of the old brick drain had been taken away and drain-pipes had been placed in the bottom of the old drain with nothing at all in the joints, and some of the pipes entered the joints or sockets and some did not do so, and some of the pipes were broken. The result was that the outside of the pipes were filled halfway up with the soil from the drain, and at some places the soilage was running outside of the pipes instead of the inside. Through my master's instigation the sanitary inspector of the parish was sent for, as the drains had been recently laid in, and you might imagine how I was surprised when I heard the sanitary inspector inform the gentleman of the house that it would be all right when the ground was filled in, as no effluvia could come through the ground; and as to the pipes that were broken I might put a bit of cement on the breakages; and when I stated that the drain ought to be so sound as to hold water, he (the sanitary inspector) told the gentleman that it was all very well what I said, but where there was one done so there were ninety-nine not done so, and his drains were not worse than other people's. If this is how our sanitary inspectors treat the matter in the heart of London, where are we to look for any improvement?—C. J. E.

[6177.]—**Damp-Proof Brick-Coloured Composition.**—Having a damp wall in my new house, and not wishing to go to the expense of pointing the coursing joints with cement, can any kind friend give me a composition the colour of a brick, which I can wash over with a brush, that will turn rain? The wall is a 14in. brick cavity wall.—Mason.

REPLIES.

[6167.]—**Pitch for Tile Roof.**—Amongst workmen the width of building is taken as datum, and certain portions taken as pitch. One third width is fair and safe pitch. The gauge is the distance the battens (or laths as they are termed in some localities) are nailed apart. Four inch gauge for plain tiles give 2in. lap. I have done a deal of work at 4¼in. gauge or 1¾in. lap; but to keep out snow and driving rain the work should be well treated or tiles bedded in mortar as work proceeds.—Bricklayer.

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A new meeting-room, 30ft. 6in. by 12ft., was, last week, opened at the rear of the Congregational church, Belgrave-street, Brighton. The contractor was Mr. Edward Howell, of Brighton.

The death is announced of Mr. J. C. Moore, a promising portrait-painter, especially of children's portraits.

STAINED GLASS.

Cambridge.—The east window of Corpus Christi College Chapel, Cambridge, has recently been filled with stained glass. The window, which is a five-light one, represents the subject of "Our Lord's Crucifixion," and was designed and executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, London.

Henstridge.—Messrs. Jones and Willis have recently designed and executed a three light-and tracery painted-glass window, introducing the figures of Faith, Hope, and Charity, with arms and crests in the base of each light, on a scroll or motto, including the family arms, in memory of Louisa Ann, wife of H. M. Viner, Esq., at Henstridge Church, Somerset.

STATUES, MEMORIALS, &c.

Statue of Mr. Ruskin.—Mr. Ruskin is to have a statue. The Society of the Rose, a missionary society, intended to spread abroad his doctrines, which has its headquarters in Manchester and branches at Glasgow, London, and Aberdeen, have undertaken to provide it. Mr. Boehm is going to execute the statue memorial, and it will be placed in the Oxford Museum, there to remain as evidence of the work done by Mr. Ruskin when he was professor.

WATER SUPPLY AND SANITARY MATTERS.

The Sewage of Paris.—A correspondent of the *Times* writes: "As the city of Paris has tried various chemical and other means of dealing with its sewage, and is now irrigating about 1,000 acres of land within five miles of the Tuileries, the following will be of interest to a large section of English readers: On the 23rd of June last the Conseil Municipal of Paris resolved, among other things, to approve, firstly, the continuance of irrigation in the fields of Gennevilliers, and the carrying of the sewage to the lower north-western part of the peninsula of St. Germain and adjoining farms, and the delivery of the sewage from the conduits to persons on their routes who shall be willing by agricultural, chemical, or other means to cleanse it at their own expense and risk for the sake of what they may be able to get out of it, subject to rules to be prepared; secondly, to ask the Government, in case of the 1,500 hectares (3,700 acres) might be insufficient for the purification of the sewage without annoyance to the neighbourhood, to take into immediate consideration the extension of the present proposal and the irrigation of other districts in the valley of the Seine."

LEGAL INTELLIGENCE.

Cross-swearing as to Bricks.—At the Woodbridge County-court on Monday, before Mr. J. S. Bristowe, judge, an action was brought by Henry Law, brickmaker, of Kirton, against H. Thurman, builder, of Walton, Suffolk, to recover £12 13s. 5d., balance of account. Plaintiff said in 1878 the defendant ordered 76,000 bricks in order to build a school at Ramsholt, and promised to pay the money, at the agreed-on price of 32s. per 1,000, upon the completion of the building of the school. Defendant had since paid two sums of £50 each on account, and a contra bill of £8 18s. 7d. due to defendant having been deducted, left the sum of £12 13s. 5d. now in dispute. The defence set up was that one load of bricks was inferior, but plaintiff called his man Smy, who proved that the bricks were inspected by defendant's man whilst they were being unloaded, and no complaints were made. The bricks were not sold by sample. His Honour intimated that defendant must satisfy him why he had made no previous complaint as to the quality of the bricks, although he had paid two sums on account. Defendant said he had made complaints of one barge-load of 10,000 bricks, which had been condemned by the surveyor, and which he was unable to use. He called his partner in the school contract, Mr. Finch, who stated that the bricks were purchased by sample, and that one load was unfit for use. Plaintiff denied that any complaint had reached him. Charles Finch, foreman bricklayer, said he complained to Smy of the quality of one barge of bricks, which were afterwards condemned, but Smy denied this statement. His Honour gave judgment for plaintiff for the amount claimed, holding that if the bricks were so bad the clerk of the works ought to have been called by defendant to prove that such was the case.

In re William Gibbs.—The debtor, who is a builder, of 11, Hamilton-road, Lower Norwood, has filed a petition for liquidation; and Mr. G. H. Finch applied last week for the appointment of Mr. J. M. Henderson, accountant, as receiver of the estate, and for an injunction restraining several actions. The debts, which were chiefly secured, amounted to about £30,000, and there were assets consisting of house property of the estimated value of £30,000, subject to mortgages thereon to the extent of £26,000. The Registrar granted the application.

The Building Acts.—Messrs. Perry and Co., builders, of Tredegar Works, Bow, appeared last week at Westminster to an adjourned summons, at the instance of Mr. Edward Drury, the district surveyor of St. Margaret and St. John and the Close of St. Peter, Westminster, to show cause why they should not pay the sum of £108 2s. 6d., fees which had accrued by reason of Mr. Drury surveying and causing the regulations of the 18th and 19th Victoria, chapter 122, section 51, second schedule, to be carried out with regard to the works known as Queen's Mansions East, Victoria-street, Westminster, not yet finished.—Mr. Drury conducted his own case, and Mr. Greenwood defended.—Mr. Drury relied firstly on the 27th section, sub-section 2, and contended that the blocks known as A, B, C, D, E, F, and G were separate buildings, and as such were entitled to be charged for. In January, 1879, he received notice from Messrs. Perry that the building in course of erection was intended to be used as residential chambers of an area of 10,300ft. He drew attention to Sub-section 2 by letter, and on the 22nd January notices were received that Perry and Co. would erect three blocks of buildings. Notice was then sent that there were no continuous party-walls, and attention was drawn to the section relating to this. After communicating to Mr. Knowles, the surveyor, and seeing him, the defendants were written to asking for separate notices, and on the 17th of July a Mr. Bartlett called, the notices were filled up, and they were signed for four sets of chambers on the basement, and seven each on the ground and next five floors. Mr. Drury had constantly surveyed the buildings, which were advertised as residential chambers in sets, and were so constructed as to be occupied by separate tenants, and consequently the claim for £108 2s. 6d. was made up of fees under the Act for separate buildings.—Mr. Greenwood for the defence, contended that in signing these notices his clients had no idea that this building was going to be considered separate buildings. They were really given in mistake for the original plans, and the intention was that it should be an hotel.—In answer to Mr. D'Eyncourt, Mr. Drury stated that the fee for an hotel would be £10, payable a month after the roof was on. There was communication from set to set only by a balcony. These notices were good, and they were really separate tenements.—Mr. Greenwood objected to the claim for the basement, £10 15s., as they took it of another builder, and it should be charged to him.—In the end Mr. D'Eyncourt came to the conclusion that the fees were due as claimed, and ordered them to be paid.

The "Jerry" Building at Edmonton.—In the Building News of the 2nd inst. we reported the proceedings before the Edmonton Justices upon four summonses against Mr. W. R. A. Cole, of High-road, South Tottenham, for infringing the by-laws of the Edmonton Local Board of Health, inasmuch as the defendant was erecting four houses in Town-road, within the district of the Board, the walls of which were not properly bonded and solidly put together with mortar or cement. It will be remembered that the evidence showed that the houses in question were constructed of very inferior materials, small pieces of bricks being used, with mortar largely in excess of the quantity required to execute the work properly, and that an adjournment for three weeks was ordered to enable defendant to strengthen the walls by covering them with cement to the satisfaction of the Board's surveyor. The cases came before the magistrates again on Monday last, when defendant was represented by Mr. Peckham, solicitor, who stated that a portion of the work had been done, and asked for another week to complete it. Mr. Abbess (chairman of the Bench) inquired whether the defendant had shown a disposition to complete the operations to the satisfaction of the Local Board. Mr. Houlder (clerk to the Board) reminded their worships that defendant only asked for a fortnight, which was ample time to do all that was wished at his hands; and said that nothing whatever was done during that fortnight, and now only about a third of the work was finished. This was the second time the Board had been compelled to adopt proceedings against the defendant in respect of his contravening the by-laws. Mr. Abbess: What do you ask us to do? Mr. Houlder: To fine the defendant. Dr. Parsons, in his report to the Local Government Board on the endemic prevalence of enteric fever in Edmonton, and on the general sanitary condition of the district, used these words: "The cottages recently erected in Edmonton proper are many of them examples of the flimsiest style of jerry building. The mortar being used at the time of the inquiry in some cottages in course of erection mainly consisted of road scrapings—black fœtid sludge." The Local Board hope the Bench will assist them to prevent the necessity of similar complaints in future. Mr. Grindle, chief surveyor to the Board, in reply to the Bench, said the work had not yet been done. Some of the walls had not been touched. Mr. Abbess: Could it have been done in the time we granted? Mr. Grindle: Yes, if a commencement had been made immediately after the order of the Court. Mr. Abbess said it almost seemed that when time was granted, defendant went away without the intention of respecting the decision of the Bench. That was not the way to treat the Local Board or the magistrates, and as far as the latter were concerned, they did not intend to be trifled with. Mr. Houlder: Nor do the Board. Mr. Abbess: If defendant had really intended to carry out what he undertook to perform, he would have commenced immediately after our decision. The offences were proved on the last occasion, and we now order defendant to pay £2 10s. and costs on each of the four summonses.—On the same day that the proceedings against Mr. Cole were originally heard, William Gimson, builder, of Bayceaux-villa, Gipsy-hill, Norwood, was charged upon eight summonses, four with a similar offence as that alleged in regard to the other defendant, and the remaining four that the walls of the houses did not rest on solid ground, concrete, or other sound foundation, as required by by-law 101. The facts were reported in our columns at the time, and it will be recollected that the Bench imposed a fine of £2 10s. and costs on each of the eight summonses. On Monday last Mr. Houlder informed the justices that the money had not been paid, and asked for a warrant of distress upon defendant's property, in order that the amount might be recovered. The application was granted.—Mr. Houlder then applied for summonses against other persons building in Edmonton for infringing the by-laws of the Board, and in describing the bad character of one case, said the erection was so faulty that the occupier when poking his own fire would poke that of his neighbour at the same time. (Laughter.) The Bench granted the summonses, and expressed their satisfaction that the Local Board were moving so energetically to insure houses being erected within their district which would not become detrimental to the health of those who resided in them.

Our Office Table.

The large number of street accidents in London during the year 1879—3,935 killed and injured—led to the formation of a society having for its object the arousing of public attention to the subject, and the adoption of means to secure the better safety of foot-passengers in the streets. Lord Templetown, in appealing for aid to the society, now states that during the short time of its existence it has done much to bring about a better state of things. The attention of Parliament and of the Home Office has been directed to the question. Additional refuges have been erected at several points where the exigencies of traffic most imperatively called for them. The number of dangerous street accidents has perceptibly diminished, and the general public have greatly benefited by the society's efforts.

The pass list of the second examination in technology under the direction of the City and Guilds of London Institute for the Advancement of Technical Education has now appeared. The results of this examination, as compared with those of the previous years, show a very considerable increase in the number of candidates, and in the number of subjects in which they were examined. In 1879, 202 candidates were examined at 23 centres in seven subjects, of whom 151 passed; in 1880, 816 candidates were examined at 85 centres in 24 different subjects, of whom 515 passed. The towns furnishing the greatest number of candidates were Crewe, Bolton, Oldham, Kenmare, and Newcastle-on-Tyne. In eight subjects no candidates presented themselves—namely, in fuel, glass manufacture, goldsmiths' and silversmiths' work, lace manufacture, manufacture of oils, colours, and varnishes, oils (illuminating and lubricating), printing, and sugar manufacture. The prizes awarded are fourteen honours prizes of £5 each, 21 advanced prizes of £3 each, 20 elementary prizes of £2 each, besides 26 silver and 56 bronze medals. The estimated amount of the grant to teachers on the results of the examination is £495 against £67 last year. The largest percentage of failures is in iron manufacture, in which subject there are 56 failures to 27 passes. In mechanical engineering the percentage of failures is also very great, one candidate only having passed out of 14 who presented themselves for honours.

THE BUILDING NEWS.

LONDON, FRIDAY, JULY 30, 1880.

THE VICTORIA EMBANKMENT.— A CONSTRUCTIVE STUDY.

LET us take a stroll, not down Fleet-street, but along its modern parallel, or analogue, the "Victoria Embankment," and thoughtfully study, from a builder's point of view, the various contributions from Nature's storehouse which have been used in its construction, and some of the important buildings erected on its side. Our starting-point shall be the junction of the new Boulevard with Bridge-street and Blackfriars Bridge, and we will, by looking westward, examine the general effect of the well-formed road, footpaths, and lines of trees.

We shall turn our back upon the unsightly structure of the London, Chatham, and Dover Railway Bridge, with its river-piers faced externally with the Portland stone from the ruins of old Blackfriars Bridge, and in a condition ill-calculated to inspire confidence in the stability of a structure with such dilapidated surroundings. The new Blackfriars Bridge, in some respects, forms a pleasing contrast to its very unbecoming neighbour, and, in some measure, shuts out from view the railway viaduct. It is indeed, a goodly sight to look at the Embankment from the river, and appreciate the regular and symmetrical lines of its parapet, interrupted at intervals by landing-piers and other needful arrangements for maintaining the communication with the shore. The distance is not too great to fully estimate the beauties of a well-built structure, having at its eastern terminus a stately bridge, towering above which is seen the great Cathedral of St. Paul's; and, at its western end, another bridge of graceful outline, flanked and terminated by the gorgeous Palace of Westminster.

The great variety of materials used in the construction of the Victoria Embankment offers unusual facilities for the study of some of our leading building stones, and we will start with an examination of the granite of the river-wall. This good and pleasing external coating, or skin, of granite forms merely the finishing surface to an elaborate and carefully-arranged structure of first-class stock-bricks, bonded together with excellent Portland-cement mortar. That both bricks and mortar were of the best of their kind was readily proved during the excavation of that part of the wall which was to receive the foundation of the "Cleopatra Needle." An examination of a piece of this firmly-cemented brickwork proves that the cement and the river-sand which, together, formed the mortar, was unexceptionable in quality, and its perfect junction with the favourable surfaces of the well-burnt stock shows what can be accomplished when well-selected materials are conscientiously combined. The wall proper, therefore, may be regarded as one formed of the best quality of stock bricks of a bright yellow colour, hard, though somewhat porous in texture, joined together with Portland cement mortar in the proportion of one of cement to two of the cleanest, sharp, river-sand—such may be considered the embanking wall, for, practically, its extent and character warrants such appellation, and the granite facing and parapet with the coping merely represents its external ornamental clothing. To appreciate the extent and character of the granite division of the work, an examination from the river itself is indispensable, for it is there that the quality of the stone can best be seen, and the extent of its already degraded surface estimated. Granite of the best quality, ever in contact with running water, soon submits to its solvent action, which readily acts on the alkaline ingredients with which granites are invariably in a greater or less degree associated. The extent and character of the alkalies has much to do with the durability of this stone, and, as many widely-separated districts were laid under contribution for this important work, various shades of colour and degrees of textures are exhibited. The general character of the granite is, however, good, and the colour a light grey, which, considering the trying position in which it is placed, wears fairly well. The larger-grained qualities appear, however, to be the most degraded, and their original finely-worked surfaces are becoming roughened from the action of the ever-active water solvent insidiously breaking up the alkaline coherent. A careful glance along the parapet coping will show that the washing out of the cementing agent is proceeding slowly but surely. We reach Waterloo Bridge, and, if our minute and careful examination of the modern structure awakens in our minds thoughts of eventual disintegration of its graceful and substantial details, we are almost horrified at the condition of this well-known and highly-appreciated comparatively modern building. At its completion, this bridge was regarded, not only by English engineers, as a remarkable example of stable and durable construction, but French engineers also looked upon it as an engineering triumph..

Waterloo Bridge, in its present state, does not, unfortunately, testify to the prescience of its admirers. That it is a fairly-proportioned structure, and creditable to the genius of its celebrated engineer, no one can dispute, but its foundations are based on mud, and its superstructure composed of perishable Cornwall granite, which is incompetent to resist the insidious action of a London atmosphere. The balustrades of the parapet are of Aberdeen granite, and a comparison of the two granites will readily indicate the advantage of the northern deposit over that obtained from the igneous deposits of the west. The study of the granites used in the Victoria Embankment wall and parapet, and that employed in building Waterloo Bridge, will result in much profit to the building student if he will apply in his examination the necessary chemical rules and analyses. It is well known that those granites in which alkalies exist in too great a proportion are liable to early disintegration, and the measure of their durability is influenced by the quality of the alkaline ingredients, that of potash, however, securing a higher quality of durability than soda. Both these evanescent chemical agents exist in varying proportions in nearly all granites; but that which has the less of either, more especially of soda, is proved to be the more durable stone.

Before leaving the granite division of our study, we will look at the famous Cleopatra Needle, which, in its modern site, can well afford to look with indifference, if not disdain, upon its surrounding fellow structures, reared from analogous igneous rocks. Age, indeed! Who can denote with accuracy the period when the monolith was quarried from its granite bed in far distant Syene? Or who can enumerate the human lives sacrificed during the time of its removal from its natural bed to its final erection amongst its numerous fellows on the banks of the Nile? The interval of time, and the vicissitudes through which Cleopatra's Needle has passed, were indeed calculated to degrade an obelisk beyond recognition, composed of ordinary granite, or less durable materials.

The granites of our Victoria Embankment are grey in colour, and the Obelisk red, denoting, in its analysis, the presence of iron oxides. Geologists and mineralogists are not quite unanimous as to the exact proportions or description of this famous Egyptian granite. The analysis, however, is as under :—

Silica	70·25
Alumina	16·00
Oxide of iron and manganese	2·50
Lime	1·16
Magnesia, soda, and potash	9·00
Water and loss	1·09
	100·00

It may be described as a granite formed of quartz, orthose, oligoclase, and frequently also of hornblende; but the latter is very limited in quantity. This granite is capable of being very highly polished, and in the Egyptian climate maintains its surfaces unimpaired, having been originally used in lining the Great Pyramid of Cheops. Perched on its modern base, in a humid climate, and subject to the baneful influences of a London atmosphere, it will, in some distant future, solve the problem whether any granite can exist unimpaired in such a situation. Already preservative applications are imparted to its surfaces, which may retard or impede its decay; but cannot, we fear, prevent the unavoidable degradation consequent on its modern Western location.

Let us now make our acquaintance with the gault bricks used in some of the walls on the land side of the Embankment, along which we will now saunter. Walls, dividing the carriage and footways from private gardens, at several points on the Embankment, are constructed of gault bricks with a Portland-stone coping. At the eastern end, and near Blackfriars Bridge, the wall so erected may be regarded as merely temporary in character; but for the time during which it has existed, ample opportunity is afforded to judge of the character and quality of the materials of which it is formed. The bricks may not be regarded as the best which can be produced from gault clay; but the external defects which they now exhibit, after so comparatively short a time, indicate that they are not suitable for building purposes, where uniformity of surface or freedom from flaws is an object. A careful inspection of the bricks in question indicates that the degrading action of the weather has destroyed the original face of their surfaces, and thus gradually permitted the presence of water, which, when frozen, has already exerted a mechanical influence, resulting in the elimination of various-sized pieces of the brick. The writer has made a careful observation of this almost unobserved process, and after frost and during thaw, was surprised at the amount of disintegrated brick which accumulated at the base of the wall in question, on both of its sides.

Gault clay, when properly tempered and rendered thoroughly homogeneous, produces bricks of a high class, from the peculiarly favourable character of its chemical constituents. Its natural state is, generally speaking, stiff, and, in some deposits, highly indurated; but before being converted, or moulded, into the desired forms, should be well tempered and rendered plastic. Where this desirable preliminary operation is dispensed with, and the clay used as dug from the pit or quarry, and at once passed through a brick-machine, much faulty forms are produced. The character of the flaws of the bricks on the Embankment indicates that the pressure applied when they were moulded was insufficient to *weld* the irregularly-sized pieces of clay, and thus prevented the accurate application of the heat of the kiln, resulting in the cracks so prominent in the bricks built in the wall in question. In all probability, the authority controlling the works of the Victoria Embankment selected these bricks from their pleasing colour and apparently hard character; neither quality, however, has secured a sound and sightly wall. If the wall proper and its constituents fail to please, we are still less satisfied with the condition and character of its coping. The Portland stone, of which this finishing course, or cap, is made, either must have been of exceptionally bad quality, or the particular site in which it is placed is subject to an exceptionally damaging climatal influence. Portland stone, of which St. Paul's Cathedral, Greenwich Hospital, and Somerset House are built, obtained from the famous Oolitic deposits in Dorsetshire, has a reputation for great durability, and we therefore conclude that the supervising check on the quality of the materials was not vigilant enough to prevent in this particular spot the use of stone, which is simply a disgrace to the authorities under whose direction it was built.

The railing bounding the Temple Gardens is a very creditable work, and the stone in its foundations and plinth forms a remarkable contrast to the adjoining coping we have referred to. The quality of the stone and ironwork of this ornamental railing and the quality of its workmanship form a becoming screen between the Embankment and these charming gardens. It is a great pity that the Templars did not make the iron railings wider apart, and so enable the public to get a good view of the ornamental gardens and buildings of the quadrangle. Their being so closely railed off cannot proceed from any selfish feeling on the part of the Temple authorities, for they display the utmost amount of liberality in throwing their well-kept gardens open to the public. The high brick wall in the Whitehall quarter is simply disgraceful, and the Metropolitan Board never should have allowed such an eyesore to have been erected.

(*To be concluded.*)

ST. MATTHIAS' CHURCH (UPPER TULSE HILL) COMPETITION.

THE committee have made a selection from fifty or more sets submitted to them in this competition, of four designs, and these have since been further considered. The instructions to architects required a church of red brick or stone, with stone dressings of plain character, with tower and spire, and all necessary fittings, capable of accommodating 800 worshippers and to be arranged to admit of economical enlargement. The cost was limited to £7,000, including architect's commission; and a builder's estimate was required to be furnished, as a guarantee of the performance of the architect's design. One of the conditions stated that the church will probably be built in three sections. A rather unusual course was adopted as regards the identification of the designs, though it has had the effect of preventing any unfair knowledge of the authors' names from transpiring. The drawings were requested to be sent under motto only, not accompanied with sealed envelopes, and when the selection of the committee had been made, an advertisement announcing the motto and asking for the name and address of each competitor was to be published. This course has been acted upon by the committee, as our readers will have seen in our last issue, though it was found impossible last week to announce, as intended, the motto of any design, for a very simple reason, namely, that the committee could not come to a decision till they had carefully gone through the details of the design they thought the nearest to their requirements, and for which purpose they had to put themselves into communication with the author. Though the committee comprises among its members several practical men, two or three architects and builders, besides their own indefatigable secretary and churchwarden, Messrs. Martin, engineers, to whose efforts, we understand, the present church accommodation, as well as the proposed, are mainly due, it has had to meet with some difficulty in coming to a decision, partly due to those who oppose the building of a new church in the district, and also from the Metropolitan Board of Works, in respect of the line of building. The last point has considerably delayed the decision of the committee with respect to the plans, as many of the competitors have failed to adapt their building to the site; others have not taken into consideration the provision of entrances for the convenience of residents living in the neighbourhood of Lockhart-road; while a few have neglected to utilise the difference of levels of the site. Many of the authors have made no provision for concrete foundations, an important item in a district where the ground is of a treacherous or clayey nature; other designs show no means for future extension. Moreover, as usual, individual preferences and the influence of donors, have added to the difficulties against which the committee have had to contend. Certain members of the committee, we understand, have been captivated by the attractive interior of "Experientia," the chief fault of which design is that its author has not shown space for future extension, and has not provided concrete, or a room below the chancel; while others have formed an attachment for the design marked "Faith." On Tuesday evening, we hear, the committee accepted *conditionally* the design bearing the motto, "Red Cross," the authors being Messrs. Harnor and Waters, of 8, John-street, Adelphi.* It was found that not one of the designs met all the requirements, and the duty of the committee under these circumstances was to select a design requiring the least amount of alteration. From a careful inspection of the five designs we are inclined to think the committee on points of utility alone have come to a fair conclusion. The plan of "Red Cross" fairly adapts itself to the ground; the author has shown means for extending the transepts on both sides; entrances are shown at convenient points, and the levels of the ground and the foundations have been consulted. Moreover, we think the architectural character of the building in every way suitable to the locality; no expensive ornament or elaborate tracery is shown; the style is plain sensibly treated Early English, of brick relieved by stone dressings. We necessarily limit our opinion to the designs we have seen, but the selection of these of course rests with the committee. On this account we may express our regret the building committee did not see their way to allow the whole of the designs to be submitted to, and adjudicated upon, by Mr. Street, or Mr. Pearson, as proposed; but we have nevertheless confidence in the architectural and practical ability in the committee, that the best for the purpose have been distinguished. We also regret that the committee did not offer two or three premiums; it must be confessed a great deal of labour and ability have been expended by the competitors, as the designs we have seen exhibited fully bear out.

We may now give the result of our notes on the five sets selected by the committee, and which were written before the decision we have mentioned above was made. We may just premise that the site of the church is quadrilateral, Upper Tulse-hill forming the western boundary, and Lockhart-road the southern.

"Faith, and a Black Cross," shows a church of wide proportions, comprising a nave and two aisles, transepts, organ-chamber, and vestry, one on either side, and an octagonal apse. The planning is symmetrical; the aisles are not continued to the end of nave, but form a break on each side. There are three wide bays besides the transept, and the author has produced a commodious well-planned nave, finished with brick in an Early English style. The roof is open and timbered, the ribs spring from short hammer-beams, and tie-rods are shown. A well-proportioned tower, with spire, is shown at the west end, forming a lobby entrance on the south side. The tower is pleasingly varied by the octagon, with engaged pinnacles. Accommodation is provided for 840 worshippers. The pencil perspective and ink elevations exhibit good detail. "Faith in a red circle," favourably spoken of, is a church with nave and two aisles, an octagon-ended chancel, with clergy and choir vestries on the north side forming a projection. There are five bays shown. The vestry accommodation is arranged on the chancel-floor level, and the heating is by stoves underneath the vestries. We can speak approvingly of the elevations and interior features. There is a boldly-treated tower and spire at the east end; the former has an octagonal upper stage as in the former design, and there is a flèche springing from the chancel gable. Large triple windows light the clerestory, and these are close set. The east end is lighted by triplets, and the western gable is pierced by three windows. The author has again selected an Early or 13th-century style of English Gothic. A detailed specification accompanies this set, and we find the author estimates his building separately as follows: Nave and aisles, £3,200; chancel and vestries, £1,700; tower and spire, £1,700; boundary wall, &c., £1,700; making a total of £7,000. In compliance with the instructions, builders' estimates are appended. Neatly-drawn ink perspective and elevations are sent in under motto "Experientia." The author submits two designs, but the position assigned to the plan on site and the means of extension are not satisfactory. The first set, marked A, exhibits a plan with nave and aisles, with clergy and choir vestries on the south side of chancel; the latter is finished as a semi-decagon. The north aisle extends to correspond with the vestries, and the arcade shows five bays. At the west end there is a lobby-entrance, as well as a porch under the tower at the south-west angle, which is set close to the nave. Stairs to a gallery are shown at the opposite corner of the western lobby, as the author proposes to enlarge the number of sittings by this means, the additional accommodation thus obtained being 100. A choir of 36 is proposed in the chancel, and the organ is intended to be played from the latter. We cannot say we like the rather low and meagre tower and spire: it would have been better to have omitted the spire and built a larger tower; nor do we admire the way the former feature is made to spring from the tower: there is a low gabled form of parapet with squat circular pinnacles at the angles. The walls are proposed to be faced with red bricks, having stone dressings, and brick bands and voussoirs are shown internally. The chancel is groined, and there is an open-timber roof over the nave. The number of sittings provided is 830, and the estimate, guaranteed by Messrs. Dove, Brothers, is £6,700. In the drawings the author has adopted a mixture of English and foreign detail. The second design of "Experientia," marked B, is drawn in a similar style, Decorated in character, the main difference being a wider nave; the aisles reduced to passages, and the introduction of transepts, by which means the accommodation is chiefly provided for in the nave and transepts. Of course, the great gain to be obtained by making the aisles passages is, that there is no obstruction to the view; but this advantage is obtained at the sacrifice of the proportions of the nave. There is a lofty clerestory, which will be a good feature; the chancel is rather too low in height, and the tower and spire have the same meagre effect in their proportions as the last. The author appears to have adopted the transepts as a means of obtaining future additional accommodation by galleries holding 100 persons in each. On the north side of chancel is the choir vestry, with organ over, and on the south side is the clergy vestry of larger size, capable of being used for classes. The heating is provided for by chambers under the latter vestry, and a sum of £150 has been proposed for this purpose.

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* See page 123.

The two designs with motto Red Cross in Circles are distinguished for a careful study of the site and the conditions, and architecturally, are equally worthy of the committee's consideration. Let us first take the design marked A, shown by a set of well-drawn and vigorous ink drawings. Here we have a cruciform plan, well proportioned in the various parts, and carefully adapted to the ground. There is a well-proportioned tower and spire at the west end. The former is treated in a plain brick but dignified style, without buttresses, while the spire is of good form and elevation, and the detail of the whole design, in an Early English style, is worked out in a masterly manner. The transepts project slightly; the choir and clergy vestries are shown on either side of chancel, and the latter is terminated as a semi-octagon. The tower, which forms an entrance porch, is at the south-west angle; its outer boundaries forming those of the aisle and west-end. An entrance is obtained also in the centre of west-end. Plan A shows a nave of 93ft., and a good detail of seats is shown. The estimate of the author is £6,750, and accommodation is shown for 836. The alternative design under B shows slight transept projections, and a symmetrical arrangement of the vestries at the east end; the principal difference is the substitution of narrow aisles to serve as passages, and the plan thereby secures an unobstructed area. The font is placed in a small semicircular recess on the north side; there is a narthex arrangement for the west end, which is treated in a bold and effective manner externally. A well-coloured perspective shows red brick walls relieved by a roof of green slates, and the schedule of accommodation gives 828 as the total number. In both designs the interior treatment is simple and inexpensive, and the details are well drawn. Below the chancel end, rooms are obtained by utilising the fall of the ground—a point we find wanting in some of the others. Another design, with monogram "R. H.," is characterised by a more florid treatment than either of the former. The style is Decorated, all the windows have traceried heads, and those in the aisles are square-headed. In plan the arrangement is hardly so pleasing or satisfactory; there is a square-ended chancel, a vestry and organ chamber on the north side, and a baptistry on the other side, and a tower and spire at the south-west corner. The drawings are lightly inked in, and while we must praise the neatness of some of the detail, we can hardly think the design economical enough to meet the requirements of the committee.

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THE ANCIENT BUILDINGS OF HALIFAX.*

IN these days of restoration and reconstruction well-drawn views of old buildings have a claim to our regard; and reliable drawings illustrating old domestic architecture are even more valuable, as they often become records of buildings left to the tender mercies of proprietors and leaseholders. The parish of Halifax abounds in old halls and half-timbered buildings of the seventeenth century, and Mr. John Leyland deserves our thanks for having brought out a series of photo-lithographs of some of the more important of these, with brief descriptive notes, that will be welcomed by all admirers of Halifax and its neighbourhood. The only regret we feel is that the drawings were not executed with more architectural care in details, and that the shading and trees were not more sparingly employed to produce effect. There is an unpleasant indecision in the details, and a woolliness of effect in the shaded parts, which give a mannered treatment to some of the views. We take, for instance, a few points to illustrate our meaning. In the view of ancient building, in Elland, there is a meagreness and poverty in the timbering; the shaded parts are finical in touch; the bay windows in Plate VI. are surely drawn out of perspective; the next plate shows a grand old mansion, but the view, to our mind, has been wholly spoilt by the disproportioned amount of foreground introduced; the trees in Plate XXI. are poorly drawn; and there are other evidences which almost incline us to think that the drawings in many cases have been copied from photographs. But, although saying so much as regards the technical qualities of the drawings, we are not unmindful of the interest in the subjects themselves which the author has endeavoured to impart, nor the difficulties which beset the attempt to restore to their original condition some of the examples given. Mr. Leyland, at least, has felt the value attaching to the old buildings he has attempted to illustrate, and his book, with all its shortcomings, is an interesting contribution to the history of the domestic architecture of Halifax. The selection made seems to be a good one, illustrating as it does the stone-built mansions erected in Jacobean times, such as Barkisland Hall, in Plate II., as well as the timbered houses in the locality. The timber examples are first described. Halifax was originally a quaint town built chiefly of timber, and until modern times, as the author says, there remained lines of curious overhanging houses on both sides of Crown-street. But we may take a few examples from the book itself, and here we notice the author has disregarded "incongruous alterations and defacements, with which bad taste and long neglect have surrounded many of the ancient houses," and they have been drawn as they most probably appeared when surrounded by lawns and gardens. We confess we should have preferred to have seen them as they now exist. Among the timber examples "Broad-Bottom Hall," or the "Old Chapel, Wadsworth" (Plate XXV.), is given as the oldest example in the parish, its date being about 1350. Its exterior has been completely altered, but fragments of the interior remain, from which the conjectural drawing is made. The pointed ceiling partly exists; also the old wainscot of overlapping planks of oak. The original dimensions were 29ft. by 16ft., and the point of arch 16ft. from the floor. The original windows have disappeared; but the author shows a five-light window of the fourteenth century at the end. The decoration in the panels of vaulted ceiling is hypothetical, we find, and certainly would have been better omitted. The chimney-mantel corbelling does not, as shown, look like old work, and the table introduced is quite modern in spirit, and does not add to the effect. Shibden Hall, the seat of J. Lister, Esq., is partly of timber; the date is about 1400, but looks rather recent in some of its details. Plate XXI. shows a half-timbered house, re-erected in Shibden Park, brought from Cripplegate. The drawing shows a restoration, but the surroundings do not at all harmonise with the building; and if this is a truthful restoration, we cannot say much for it. The stream is not in true perspective. "Sunny Bank," Greetland, is another timber house illustrated, but the landscape represented is desolate-looking, and can hardly be thought to show the original site. Plate XIII. represents one of the few remaining timber buildings in Halifax. The timbers are now hidden by plastering; the coved woodwork is singular; indeed we should be inclined to question the accuracy of this restoration. The grotesque carving to the gateway is of interest. The "Spread Eagle Inn," in the old market; the ancient house, Woolshops; the "White Swan," and adjacent houses in Halifax, are particularly interesting instances of the old half-timbered houses in the town. Most of these buildings have been destroyed or covered over with plaster, but the illustrations show them divested of this covering, and restored, from existing evidences, either wholly or in part. The "White Swan" and adjoining houses are restored, from fragments discovered on their demolition in 1859, and are represented as they appeared in the middle of the 18th century. The "Spread Eagle Inn," now destroyed, has also been shown, from existing data, though with what accuracy we should not like to say. It is, however, suggestive of treatment. The great house in Erringden is one of the old stone mansions. The author says, in his introduction, "From its architectural details and the peculiarities of its internal construction and arrangement, there can be little doubt that it was erected about A.D. 1450." The front has a pleasing variation in its gabled breaks, there are no less than four, the largest projecting beyond the others. One interesting feature is the projecting porch with the peculiar pediment-like feature above the doorway. Its present state is described as deplorable; the interior is "cold, damp, and cheerless," and the building is abandoned to ruin. By the permission of the author we are enabled to present our readers with a reproduction of plate XI., which represents a recent restoration of one of the upper apartments or Banqueting Hall of the Old Cock Hotel, Halifax. This old house was one of the largest built in the town; it stands in the Southgate, and was erected in Elizabeth's time. It seems to have suffered considerable changes, since it was a mansion with its pastures and gardens around it. The banqueting-hall, the subject of our illustration, has been recently restored, and its mantel-piece is a unique example of Elizabethan carved work. In our recent review of prize drawings at South Kensington, are mentioned two drawings of the old fireplace from measurement. The date, 1581, occurs on one of its flat mouldings. "Above, in stucco," says Mr. Leyland, "are the armorial bearings of the illustrious family of Savile, whose branches were, at the time referred to, settled at Copley, Hullenedge, New-Hall, Over Bradley, Blaithroyde, and Shaw-hill. It was undoubtedly the custom of the junior branches of the house of Savile, at that time, to plant their families in goodly mansions, in various places within the parish of Halifax." The author further thinks that the house was erected by Sir Henry, the warden of Merton College, and in proof of this, quotes a letter addressed from Halifax in 1592 to his friend Stow, the historian. The hall was a large and lofty apartment, lighted by a window three tiers in height and twelve lights broad. The house was sold in the 17th century for a hostel. The panelling of the walls, ceiling, and fireplace of the hall illustrated, are particularly fine specimens of the period. Plate XII. shows another interesting specimen of the architecture of the 17th century, formerly in the Swan Coppice, where the town-hall now stands. One of the rooms has a fine plaster ceiling. Barkisland Hall is a particularly good example, and is illustrated by one of the best plates. The family of

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* Views of Ancient Buildings, Illustrative of the Domestic Architecture of the Parish of Halifax. By John Leyland. Halifax: R. Leyland and Son.

Gledhill were identified with the Royalist cause, and one was slain in Sir Marmaduke Langdale's regiment at Hessey-Moor, in 1644. The date over door is 1638. Kershaw House, Midgley, is another excellent specimen of the domestic buildings of this period. The wide gables and many-light mullioned windows, the curious projecting porch with rose window, and the simple effective details of gable-copings and ornaments are characteristic. Broadfold, Midgley, is another illustration of interest. Its broadly-treated façade, centre gable, and plain mullion windows have a thorough-going stone character, but the mansion now no longer exists. Norland Lower Hall is pleasing, but in all these drawings the chimneys appear to be modern. Several houses of the Stuart period have been demolished, such as Broadfold and Boothroyd, both of which are given in the book; others have suffered spoliation at the hands of modern builders, but Mr. Leyland has done some good by recalling their likeness and features. Several peculiar features may be pointed out. Thus at Binroyde, Norland, we have a succession of five wide gables with mullioned windows; "its hall-body, once open to the roof, has had a ceiling constructed on a level with its gallery, but in the attic thus formed the original decorations still remain." Clay House, Greetland, is a grand old mansion; Brearley Hall, Midgley, is represented by a view of interior hall. Altogether 25 plates are given, illustrating many of the finer specimens of domestic architecture in the neighbourhood. They have all been printed by Mr. J. Akerman, and the subscribers to Mr. Leyland's volume will have cause to thank him for publishing views that will revive dying memories, and rekindle some enthusiasm for the domestic architecture of the locality.

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BRISTOL AND GLOUCESTERSHIRE ARCHÆOLOGICAL SOCIETY.

THE fifth annual meeting of this society opened at Stroud on Wednesday, July 21, under the presidency of Mr. E. Caruthers-Little. After the business was transacted visits were paid to Bownham House, Rodborough, and Minchenhampton.

At the evening meeting Mr. C. Wethered read an interesting paper on the.

DOMESTIC ARCHITECTURE ABOUT STROUD.

He said in "the spacious times of great Elizabeth" there was no fairer portion of what was styled of yore "Merrie England" than this. The traveller from these parts who passes from the antique cities of Bruges and Ghent to the not less interesting cities of Brussels and Antwerp will find in those earlier homes of the arts much that is characteristic of these old structural forms around us—an intermingling of moulding and shapings that may be likened to the foreign idioms which often tinge a provincial dialect. A strong Flemish feeling is also discernible in numerous carved oaken chests, chairs, and tables still existing among us, or scattered elsewhere. The art workmen of those days seemed to have combined an intuitive perception of the beautiful with a faculty for its realisation in outward forms of appropriateness and grace. Hence the thoroughness that comes from an intelligent and honest use of materials to ensure the end in view. A national architecture, to be worthy of the name, should be the shaped result and bodily expression of the thoughts, tastes, and genius of a people. From the Norman Invasion, down to a period even later than the Tudors, we possessed such an architecture, eminently suited in all its phases to our climate and conditions, and applicable to all purposes, religious and civil alike. Owing mainly to the skill of our local masons and their seclusion from the chief centres of innovation, together with the excellent quality of the freestone, its traditions lingered much longer in the Gloucestershire valleys than elsewhere. Stroud possesses an object of antiquarian interest in its Town Hall, dating in the opinion of a distinguished authority, Mr. Parker, of Oxford, from the 15th century. Stript of its recent additions, from an architectural point of view, it is worthier of notice than the costly modern building of greater pretensions close by. It has scale and proportion, with a quiet dignity of its own. As specially domestic types of illustration, I may take More Hall, near Randwick—said to have been founded by a nephew of the celebrated Sir Thomas More—and the Court House, at Painswick. These are in reality nothing more than a grouping and blending on a wider scale, to meet larger wants, of the elements to be found in every adjacent cottage of the same date; bringing every tenement, however humble, into a kind of masonic relationship with the rest. Much of their attractiveness depends on the mode of fenestration, and on the steep declivity of their roofs; the windows being either a single opening with boldly-chamfered framing, or of two or more lights divided by mullions, and frequently crossed by transomes. The dripstone above is still more effective when carried round as a stringcourse, by defining a height and marking a flooring, while it adds in its long line of shadow a frown to the front. The roof, the crowning of the edifice and the symbol of home, is always conspicuous from its size and pitch, having an angle of inclination seldom less than sixty degrees. Broken up into many gables, it imparts variety to the skyline and increases the play of light and shadow. Above all rise the bold stone chimney-heads, worked in the solid and often set on the diagonal; putting to shame those flimsy pot-and-pan cylinders stuck on yesterday and apt to be blown down to-day. Unity of local means and appliances is further preserved by roofing with stone tiles, a natural formation principally occurring, I believe, in the Oolitic beds of Tetbury. From long exposure to the weather the outer surfaces have acquired a tone of the warmest grey, softened by nature's own touches of colour in moss and lichen. The Cotswold masons have left upon their hatched and chiselled stones that impress and strength of endeavour which clearly shows in lasting marks how "joy's soul lies in the doing." Much of what they built has been destroyed or defaced by the meddlesome hand of the spoiler, moved by that spirit of unrest which is one of the besetting sins of modern life. An arrest of continuity in the vernacular architecture of a people or race dulls and checks the æsthetic yearnings of the craftsman. Such an arrest occurred, though later here than elsewhere, when the blight of the Classic Renaissance swept over France and England. A century or more ago it led to the transformation of Stratford House, The Field, Steanbridge House, and many another neighbouring "haunt of ancient peace" into the state in which we now see them. Every one of their monotonous façades, with the inevitable portico, and windows of the same deadness of shape, size, and number on each side, is the borrowed dress for forms that were then ruthlessly disarrayed. Men then did their utmost to blot out the nobler features of the dwelling-houses in which their forefathers had lived and died. After all, archæology is but the registry and classification of material facts of the past, unless we can apply some of its teachings to the formation of a system of instruction which shall bear fruit in the arts of the future. Amid the confusions arising from the neglect of ancient principles in the industrial arts, it is cheering to find traces of true Gothic feeling in the productions of the stonemasons, carpenters, and smiths of the present day. We have followers of these honourable crafts in Stroud who can read drawings and render results in a way quite worthy of their ancestors.

STROUD HOUSES.

Mr. C. Playne read a paper on "Stroud Houses." He said the oldest building which he had found in that neighbourhood was a granary near the residence of their president, and the oldest dwelling-place was Dennay, in the parish of Bisley, close to the Thames and Severn Canal. The next oldest was More Hall, near Stroud, and then came the Court House, at Painswick, where Charles rested after his repulse at Worcester. Next in point of age was the interesting old manor house Owlpen. One place deserving attention was Bradley, and as it was stated Shakespeare once lived at Dursley not far from it, the place had been suggested as that the dramatist had in view as the residence of the worthy Justice Shallow. He came to the conclusion that they had in those old houses remains far more pleasing to the eye than most of those built at a subsequent period. He recommended those who might build houses to put their initials on them and the date, for the benefit of archæologists who might come 400 years hence.

THE ROMAN PAVEMENT AT WOODCHESTER.

On the second day a visit was paid to Woodchester, in order that they might view the pavement of the Roman villa, which had not been uncovered since 1852. This villa was not so much a single building as a group of buildings, connected by colonnades, and surrounding one or more quadrangular courts with a fountain in the centre. The pavement in question probably formed the flooring of the chief hall or atrium, where the Roman governor received his clients, and the mistress often sat engaged in spinning. The earliest mention of the pavement is in the additions to Camden's "Britannia," published in 1695 by Bishop Gibson, and Sir Robert Atkyns in his "History of Gloucestershire" also speaks of it. About 1785 a small part of the pavement was uncovered, containing figures of an elephant and several birds, but the damp and frost destroyed these delineations. In 1793, in digging a vault for Mr. John Wade, of Pudhill, or Parkhill as it is now called, a great portion of the pavement was laid open, and in the two years following excavations were made in a field adjoining, and foundations of buildings were found extending nearly 500ft. on the south side of the pavement. This interesting relic of Roman times was opened in 1842, again in 1846, and then in 1852. The large party of archæologists who assembled on the present occasion to see the once-more uncovered pavement listened to a description of it by Mr. J. D. T. Niblett. The general design is a circular area 25ft. in diameter. This area is surrounded by a border, within which are representations of various beasts (originally twelve in number) on a white ground, with trees and flowers between them. The figures of a gryphon, a bear, a leopard, a stag, a tigress, a lion, and a lioness, are now remaining. Most of these figures are about 4ft. in length. Within this circle is a smaller one, in which birds are represented on a white ground; in this circle is also the figure of a beast which seems designed for a fox. Within the circle of birds is an octagonal compartment, with openings to admit the principal figure of the design, which is now much mutilated. When the first drawing was made the head only was wanting; it represents Orpheus playing on the lyre, which he rests on his left knee. In the four angular spaces between the border and the circular compartment are remains of female figures, two of which appear to have been in each of these spaces; the figures in the north-east angle, which are more perfect than any of the others, are evidently designed for Naiads. The tesseræ of which this pavement is composed are for the most part cubes of half an inch. The compartments are coloured harmoniously with dark blueish-grey, red, white, and several shades of brown; most of the materials are from the neighbourhood. The pavement will, for a short time, remain uncovered, that such of the public as choose may inspect it. Buckholt and Uley Bury were next visited, and after the tumuli had been inspected, the members pushed on and subsequently inspected Frocester Barn, a most interesting archæological relic. Leonard Stanley Church was afterwards inspected, and described by Mr. J. Middleton, jun. The party then returned to Stroud.

At the evening meeting several papers were read, one by Mr. W. J. J. Powell on the alleged murder of Edward II., and another contributed by Mr. J. Middleton on

LEONARD STANLEY CHURCH.

The author noted that although in late times monastic and collegiate church plans, through various alterations, became very much alike, yet in their beginnings they had quite a different origin and development. The churches of the monks, even the earliest we are acquainted with, are large cruciform buildings with aisles, and this original Norman plan was generally adhered to through the many later changes that took place. Canons' churches, on the other hand, took as their model the ordinary parish church—in fact, most Canons' churches were parish churches, either from their foundations, as is the case here, or from having a collegiate foundation added afterwards. Now the original Norman plan for a parish church, with very few exceptions, was a building, sometimes with transepts and sometimes without, but in either case with no aisles. The tower, if there was one, was nearly always central, though comparatively few of these remain, either because they have fallen down, a thing very common with Norman work in spite of its apparent strength and solidity, or else because they have been removed on account of the massive piers being too great an obstruction to a clear view of the choir. In this case the choir has had a narrow escape; the piers show considerable settlements, and are much bent out of the perpendicular. In adopting this parochial plan for their churches the canons naturally chose the grander type, namely, that with transepts and tower, often greatly increasing its scale, but still keeping to the aisleless form. Very soon, however, together with the introduction of the Early English style, aisles became common even in small parish churches, and in most cases the canons set to work to add what then began to be considered an almost necessary part of any important church. But here the canons were stopped by a difficulty; they already had their cloister, and perhaps other parts of their collegiate building butting right against one wall of their church (generally the south wall) and so they were forced to content themselves with adding an aisle on the free side only; this we find at Bolton, Eastby, and Brinkburn, and many other places. In this church we have a case where no additions have been made, probably owing to the fact that the collegiate foundation was very soon absorbed into the great abbey at Gloucester, and so lost its independent character. Other instances of somewhat important collegiate churches never having any aisle added are to be found at Lilleshall, in Shropshire, and Bayham, in Sussex, but they were very rare. On account, then, of the plan of this church, and without any other evidence on the subject, we could tell at once that it was built, not for a monastic, but for a collegiate foundation. It will appear at first sight to any one looking at this church, that its proportions are rather awkward, the length being somewhat excessive in comparison with its breadth; but it should be remembered that originally it formed two quite distinct churches; the part west of the tower being the parochial church, and the rest, the eastern division, the part appropriated to the exclusive use of the canons. This division was made by the rood-screen in the western arch of the tower, against which, in the middle, stood the high altar of the parish church. This altar, from its position immediately under the rood, was called the Jesus Altar, or Altar of the Holy Rood; on each side of this there would be a door, generally locked, which was used for processions to pass in and out on certain grand festivals. This rood-screen formed a complete and solid division, fencing off the eastern part, including the tower, for the private use of the canons. Very few instances of this partition now exist—almost the only examples now remaining are at St. Alban's and Boxgrove Church. It must not be confounded with the ordinary open rood-screen, which was in every parish-church simply to form a separation between the nave and chancel. The eastern or collegiate part of the church was again divided into two parts by another screen, in the eastern arch of the tower; this screen was called the pulpitum; on it would be a gallery from which parts of the service was sung, and in the 15th century a pair of organs were generally added. The object of this screen was to divide the choir from the tower and transepts, which thus formed anti-chapels in which altars for low celebrations were placed. For the sake of giving dignity to the altars, in the transepts it was very common, during that period when the Norman style was in use, to build semi-circular apses opening out of the eastern walls of the transepts. This was the case, to take local instances, at Gloucester, Tewkesbury, and Pershore abbeys. Foundations of these apses exist at Leominster and Selby, and both the apses are themselves still in existence at Romsey Abbey Church. In the east wall of the south transept of this church there is a blocked archway, and on the wall outside the marks of a roof, which I have little doubt show the position of one of these transeptal apses. In this church we find a very unusual peculiarity—namely, that the south transept alone had an eastern chapel, there being no sign of any opening out of the north transept. The only parallel instance I know of is at Castle Acre priory. Another example exists at Patrington church, but of the 14th century, not Norman work. The absence, however, of any window; and the fact that the Norman string-course does not run along the eastern wall of this eastern transept, look rather as if it had been contemplated to add on this side too a projecting chapel like that on the south; and, moreover, the jambs of an archway, carried up only a foot or two, can be traced on the outside of the wall.

At the concluding meeting held on Friday last it was resolved that next year's meeting should be at Chepstow. The members left Stroud at the close of the meeting on an excursion, the first place visited being Painswick. A climb to the entrenchments on the top of Sponebed Hill, nearly 1,000ft. high, rewarded the excursionists by the magnificent panorama presented. There is a square camp inclosing three acres of ground, and Roman coins have been frequently dug up there. It was one of the *castra exploratoria* of the Romans. After the siege of Gloucester in 1643 the Royalist army occupied these heights. Mr. Cecil Davis and Mr. Niblett gave some particulars of the spot, and then the party continued their way to Cranham, where the great event of the day took place, a tumulus being opened. Human remains were discovered, upon which Dr. Payne made a few remarks. He said the remains they had discovered were those of two or three individuals, and it was interesting to find concrete in the tumulus. Lypiatt Park, the residence of Mr. J. E. Dorington, was next reached. The monastic house of the 16th century has a grim interest attached to it in the tradition that the Gunpowder Plot was here hatched. The house, which has beeen enlarged, is entered by an embattled porch, and is divided in its centre by a hall whose ceiling is embellished by a fresco representation of the Story of Mutius and Porsenna. Having partaken of the President's hospitality, the party returned to Stroud, and then separated.

MEDIÆVAL BARNS.

In view of the inspection by the society of Frocester Barn, Mr. T. Pope, of Bristol, forwarded the following paper:—As the society propose at their Stroud meeting to make an excursion to Frocester Barn, I send you a few notes which may be interesting as illustrating the subject of mediæval barns, many of which are very remarkable buildings, both as to appearance and also as to construction, and which are now fast disappearing. I send these notes as I have paid considerable attention to the subject for some years. The Glastonbury Barn is probably the best known, and is the most ornamental of all such buildings I am acquainted with. It is so well illustrated in Pugin that it is needless to refer further to it. The Abbey Barn at Ardennes, near Caen, is also well known and illustrated. It has two aisles and nave, and measures 154ft. 6in. long, the nave being 22ft. span, the aisles being 5ft. 8in. and 11ft. 6in. wide respectively. The arcades in this case are of stone; the English examples are generally when consisting of nave and aisles, formed of oak posts. The great barn at Peterborough, now destroyed, was about 150ft. long by 36ft. wide, and consisted of nave and two aisles, the posts being of oak. It appears to have been an early barn, with the roof to a pitch of about 55 degrees in one span with two well-proportioned transepts. Remains are still existing of a very remarkable barn at Abbotsbury, which has a parapet upon the exterior evidently for the purposes of defence. Unfortunately, I had no time when there to make a plan, but judging from the roof, which is hammer-beam, and the niche which terminates the gable-end, I should judge this building to be fifteenth-century work. The barn at Bredon, Worcestershire, is well worth a visit; it consists of nave and two aisles, nave 20ft. wide, aisles 8ft. 6in. each, oak pillars about 13in. square. The aisles have collar beams at springing of gables, from which spring large curved braces to support collars of centre roof. The roof is of one span on the exterior, as usual, and there is a remarkably beautiful stone chimney to a chamber formed in one of the transepts. The length of this barn is about 130ft., and the exterior effect is quite equal, if not superior, to many churches. There is no straining for effect; everything is natural and fitted for the work it has to do. The gables of transepts are formed of oak and plaster. There is nothing to mark the date. At Winterborne, in this county, near the church, half the ancient barn still remains: it consisted originally of ten bays, and measured about 26ft. span in the interior. The roof is in one span, with collar beam and king post, and large carved braces brought down to within a few feet of the ground. The walls are 3ft. 9in. thick and built battering. There are two transepts with granaries in gables, and with the Jacobean stables built with gabled end between the transepts; it forms a very picturesque building, and one only regrets the loss of half of it. A fine barn remains at Clach or Bradenstoke Abbey of nine bays, with transepts. The roof is very good, of one span. This roof has the peculiarity of having a row of windows between the tops of buttresses and eaves. I should think it is of fifteenth-century date. The Abbey Barn at Lacock is curious in plan, having evidently been built to suit the streets which bound it upon two sides. I can give the scantlings of the timbers of this barn, which will afford our members some idea of the profuse use of oak in these old buildings—plates 6in. by 6in., principals 18in. by 10in., purlins 9in. by 6in., rafters 4in. by 4in. The width of this barn is 21ft. 6in. by 95ft. long, with one transept 35ft. by 20ft., height about 32ft., walls from 3ft to 2ft. 6in. thick; the curved braces are brought down to about six feet from ground-level. The way the natural bend of the timber is utilised is interesting. Most persons have noticed the Bradford Barn in going by railway from Chippenham towards Salisbury, with its elegant early detail and transepts; it appears to me to be about fourteenth-century date, but it is difficult to assign any date without mouldings or documents to guide you. At Coxwell, near Shrivenham, is a remarkable barn, commonly called Shrivenham Great Barn. It consists of nave 17ft. 6in. wide, and two aisles each about 7ft. 6in. wide. Transepts one on either side are about 24ft. by 18ft. and the other shallow. There are seven bays in this barn, oak pillars resting on freestone square basis, about six feet above ground; and here it will be well to remark how careful the builders were to avoid any projections that might injure the cattle; every corner is chamfered or rounded. At Woodspring Priory, near Weston-super-Mare, the jambs are rounded evidently for this purpose. The construction of the roof at Shrivenham shows how good a carpenter must have framed it—angle ties at the corners, and ties whenever there was the slightest chance of pressure upon the walls. The corbels supporting the principals in this barn look almost like Early English work, but may possibly have been re-used from some other building; the walls are about 4ft. 6in. thick and buttressed. The roof is in one span to the exterior. There were formerly remains of a fine barn at Llanthony, Gloucester Docks. A portion of the barn attached to the Abbots of St. Augustine's country residence still remains at Almondsbury, in this county—one rather interesting at English Coombe, near Bath—and no doubt the members of this society will be able to mention many others of which it would be interesting to make sketches before they disappear. There is a sketch of a fine barn, said to be Early English, at Raunds, Northamptonshire, in Turner's "Domestic Architecture." At Calcot, in this county, is a fine barn Decorated in style, with transepts in form of two towers. This barn I have never seen, but perhaps some of our members may be able to add to our knowledge by furnishing us with other examples worth studying and illustrating. The chief interest in the Frocester Barn is to me the excellently-framed trusses brought well down towards the ground, and the wind braces so formed as to strengthen the rafters and to give support, the lower one to to the upper one; you will notice also the short ties between the curved braces and collar beam, for the trusses only go half-way up the roof. An interesting old barn of 13th-century date, at Harmondsworth, Middlesex, was illustrated in the Building News of September 21, 1877.

THE ARCHITECTURAL ASSOCIATION.

It has been decided by some of the members of the Architectural Association to visit some of the cities in the beautiful plain of Lombardy, for study, this autumn. This district, being a clay country, is rich in terra-cotta work, as well as in stone and marble structures. It contains many interesting churches by Bramante and others, in the pure Italian Rinascimento, from

1450 to 1550; also mural decoration of all periods, from that in Sant' Ambroglio to that of Sant' Alessandro, and the modern freschi and sgrafliti in the Galleria Vittorio Emanuele. It is intended to give most attention to the Bramante period. It is proposed to devote the latter half of September to the excursion (see Itinerary). The cost will be from £18 to £20 per man, but it is intended to keep the amount as low as possible. The number of members and friends is limited to 20; and applications for the vacancies now remaining will be considered according to priority of deposit. Each gentleman will be expected to draw the particular work arranged and allotted to him by the Secretary. By this sub-division a large mass of information will be collected; and the right to edit and publish a selection is reserved to the Secretary, subject to the decision of a majority as to manner of publishing. Paper in sheets of 14½ by 12 will be purchased by Secretary; he will take temporary charge of all sketches, and on return to England will submit a scheme for rendering the information available for all. The sketches to remain, of course, the property of the gentleman making each, and any profit will be divided.

ITINERARY.

Leaving London at 7.40 a.m , on Wednesday, Sept. 15.

Wednesday, 15th Sept., Leave London 7.40 a m.; arrive Paris 6.5 p.m.; sleep at Paris.

Thursday, 16th Sept., leave Paris 3.0 p.m.; sleep in train.

Friday, 17th Sept., arrive Turin 9.4 p.m.; sleep at Turin.

Saturday, 18th Sept., leave Turin 11.0 a.m.; arrive Milan 4.10 p.m.; sleep at Milan.

Sunday, 19th Sept., spend in Milan; sleep at Milan.

Monday, 20th Sept., leave Milan 10.25 a.m , arrive Bergamo 12.8 p.m.; stay 9 hours; leave Bergamo 9.16 p m.; arrive Brescia 10.57 p.m.; sleep at Brescia.

Tuesday, 21st Sept., leave Brescia 6 p.m.; arrive Cremona 8.5 p.m ; sleep at Cremona.

Wednesday, 22nd Sept , leave Cremona 5.35 a.m.; arrive Mantua 7.45 a.m.; sleep at Mantua.

Thursday, 23rd Sept., leave Mantua 11.10 a.m.; arrive Pavia 5.11 p.m.; sleep at Pavia.

Friday, 24th Sept., leave Pavia 1 23 p.m.; arrive Certosa 1.47 p.m.; stay 6½ hours; leave Certosa 8.22 p.m.; arrive Milan 9.15 p.m.; sleep at Milan.

Saturday, 25th Sept., leave Milan 5.15 p.m.; arrive Turin 10.46 p.m.; sleep at Turin.

Sunday, 26th Sept., leave Turin 9.40 a.m.; sleep in train.

Monday, 27th Sept., arrive Paris 3.23 p m.; sleep in Paris.

Tuesday, 28th Sept., leave Paris 7.35; arrive London 5.40 p.m.

The above date of departure is fixed, but the details of circular tour from Milan may be modified to suit convenience of majority, and Como, Lodi, Saronno, and Piacenza may be included if thought desirable.

Gentlemen are requested to communicate as soon as possible to the Hon. Secretary of the Lombardy Excursion, Mr. Hugh Stannus, at No. 118, Kennington-park-road, London, S.E., from whom all further information may be had.

THE MASTER BUILDERS' ASSOCIATION IN BRISTOL.

On Tuesday afternoon the half-yearly meeting of the National Association of Master Builders was held at the Grand Hotel, Bristol, Mr. S. G. Bird, London, in the chair.

The Chairman said he very much regretted having to take the chair, and he was quite sure they would agree with him when he mentioned that it was owing to the illness of the president, Mr. Clay. Their president came to Bristol intending to take part in the business of the meeting, but he had been taken suddenly ill. Before commencing the proceedings, he begged to tender to the Mayor of Bristol their thanks for the kindly welcome given by the city of Bristol to the association.

The Mayor of Bristol stated that he had great pleasure in being present and in giving the association a hearty welcome to the city. He was very glad to see them, more particularly as they were engaged in a business with which he was to some extent connected. He regretted the absence of the president, and hoped that their proceedings would not suffer in consequence. He trusted that they would enjoy their visit to Bristol. They would find many places of interest in the city and neighbourhood, and around them there was some of the finest scenery to be found in the kingdom. He need hardly dilate upon the necessity and importance of such a society. They found labour combining for its own ends, and it was necessary for the employers to combine also for their own protection. The objects of the society were good, and he trusted that the association would continue for many years.

The Secretary of the association (Mr. Knox) having read the minutes of the last meeting at Sheffield, read the report of the council, which stated that they had obtained particulars from 98 of the principal towns in the kingdom with reference to the rate of wages paid. The depression of trade still continued, and the large supply of labour had a tendency to bring down prices. In Bristol many of the men were to be obtained at less than the recognised rate. The council recommended, as regarded apprentices, that the employers should put themselves in communication with the masters of schools in their respective districts, with the view of obtaining boys of good character, as that would be the means of raising the standard of the operatives in the building trade. The council had taken action with reference to the liability of employers for injuries caused to their workpeople by negligence, and many amendments had been proposed to the Bill. The council hoped that if the Bill was carried the amendments would be adopted. The finances were in a satisfactory condition. There was a balance in favour of the association of £329 8s. 10d.

The report was adopted, and then it was agreed that the next half-yearly meeting of the association should be held at Manchester in January.

A discussion took place relative to the liability of builders to repair roads for an excessive use of them.

The Chairman next introduced the subject of the liability of employers. He alluded to the Bill brought in by the present Government. He was sorry he had introduced politics; but Mr. Gladstone himself found the Bill brought in was quite impracticable, and that it was not a Bill he could carry, and he withdrew the Bill and took it into committee of the whole House. The Government reconsidered it, and brought in a second Bill, which they had now before the House, and which they were going to discuss. The Chairman read the Bill, and said to them the most important provision was sub-clause three, that if a man met with an accident by reason of the negligence of any person in the service of the employer who had service entrusted to him, or by reason of the negligence of any person in the service of the employer to whose orders or directions the workman at the time of the injury was bound to conform and did conform. He contended that this regulation would make builders responsible for one-fourth of the men they employed, and they asked that the clause should be expunged. He said they had deputations to different members of the Government. Sir Henry Jackson also gave them a cordial reception and tendered to them some good advice. They were drafting another clause on the basis of sub-clause 3, to take the sting out of it if possible. As to the insurance clause, there would be a great difficulty in working it as far as a builder's business was concerned. It would be a good thing for them, as it certainly would be cutting away the ground from under the trades-unions. The trades-unions ostensibly collected their money for sick benefit, but when a strike came on they used their funds for the purpose of the strike. If the Government carried out the insurance clause there would be no necessity for trades-unions getting up insurance societies, and they would not have any necessity for getting funds for them. The trades-unions would, in Parliament, oppose the insurance clause as surely as the employers would support it. The Bill would be considered on Friday, and the council would take steps to watch its progress.

Mr. Leslie thought they should try and get the maximum allowed in case of an injury £100 instead of £150.

The Chairman was thanked for his statement respecting the Bill, and then Mr. Hughes read a paper on "Quantities," which was discussed.

In the evening the delegates dined at the Mansion House, on the invitation of the Mayor.

PROPOSED FEDERATION OF BUILDING TRADES-UNIONS.

On several occasions during the past six years attempts have been made to federate the trades-unions of the United Kingdom, and hitherto each attempt has failed. The cause of these failures is mainly to be ascribed to the diversity of interest and customs existing in the many and varied branches of industry which form the trade-union movement in the country. It would now appear that there is a prospect of successful federation in the several branches of the building trade. A conference, which sat for four days last week at the office of the Bricklayers' Society in Stamford-street, London, closed its deliberations on Friday last. It was attended by representatives from the Amalgamated Carpenters and Joiners, the National Associations of Plasterers, the London District Association of Plasterers, the House Decorators and Painters, and the Operative Bricklayers' Society. These, with the exception of the masons, who, it is reported, will shortly join the movement, comprise the important trades engaged in building works. The contribution will be about 6d. per annum per member, with a shilling per member entrance fee. The contribution is not high, but should the movement prove workable, its revenues will soon increase, and its membership be multiplied. The plan of federating trades which are kindred in character has always been the one most favoured by unionists, and the present movement is said to have a fair prospect of success. The following is the preamble agreed upon before the Conference closed its sitting:—

Preamble.

1. That the objects of this Federation shall be to promote a knowledge of the principles and advantages of trade unionism amongst the operatives engaged in the building trades.
2. To secure unity of action amongst the organisations established in the building trades.
3. To endeavour to obtain, as far as is practicable, in each town or city, a uniformity of working hours in the different trades.
4. To render assistance to any trade in the Federation desirous of resisting an aggression on the part of their employers, or of endeavouring to improve their social position.

Name of Federation.

The National Federation of Building Trade Associations.

A sub-committee was appointed to inquire into and report upon the most desirable place for central offices and other details connected with the organisation.

SURVEYORS' EXAMINATIONS.

The Institution of Surveyors has just done a very good thing in establishing an examination system, which will take effect from the 31st of July, 1880, in order to meet the requirements of professional education. The examinations will be classified under three heads, viz.:—Class I. Students' preliminary examination. Class II. Students' proficiency examination. Class III. Professional associates' qualifying examination. The examinations in Classes I. and II. will be compulsory. Class II. will be divided into three sub-classes. The examination in Class III. will be voluntary, and is designed to give professional Associates an opportunity, subject to conditions hereinafter stated, of qualifying themselves to be members of the Institution.

Class I., Students' Preliminary Examination.—Any person eligible under the existing by-laws, being desirous of becoming a student of the Institution will be required to undergo a preliminary examination, with the view of testing his general knowledge and educational acquirements.* The subjects of examination will be:—Elements of Algebra, including simple equations; Euclid—the first three books; English History; composition and writing from dictation. Some acquaintance with either Latin, French, or German will also be required. Those successful in passing the examination will receive a certificate to that effect, and will be enrolled as students of the Institution. The examination will be held in the month of January in each year. Applicants shall send in their names to the secretary before the end of the preceding month of November. The pupil passing with the highest number of marks will be exempted from the payment of fees during the term of his studentship.

Class II., Students' Proficiency Examination.—A students' proficiency examination will be held biennially in the month of April. It will be incumbent upon all students elected after the 31st of July, 1880, to undergo this examination. The student will be expected to present himself at the examination next preceding the expiration of the time during which he is eligible as a student under By-Law 17, provided the unexpired term of his studentship, counting from the date of such examination, be not more than twelve months. Should this unexpired term be greater than twelve months, the period during which the student is eligible under By-Law 17 will be extended to the date of the examination next following his attainment of the age of 21 years.

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* Persons producing a certificate of having passed the Matriculation Examination of the University of Oxford, Cambridge, London, or any other University in the United Kingdom, or who have passed with honours the Senior Local Examination of the University of Oxford or Cambridge, will be exempted from this Examination.

Students may elect to be examined under any one of the three sub-classes of a table which has been arranged on the broad lines of the usual branches of surveyors' practice; but notice must be given of the sub-class and of the scientific and special subjects in which the student elects to be examined, not later than the last week of the month of November, preceding the examination.

A students' proficiency examination will be held in the month of April, 1881, and thenceforward once in two years. This examination, although not compulsory in the case of students elected before the 31st of July, 1880, is open to such students. Students elected before the 31st of July, 1880, who desire to enter for the proficiency examination in April, 1881, will be expected to signify their wish to the secretary not later than the last week of November, 1880, and at the same time indicate the sub-class and the scientific and special subjects in which they elect to be examined. Where necessary, the time during which such students are eligible under By-law 17 will be extended until the examination next following their attainment of the age of 21 years. The sum of three guineas must be deposited with the secretary by each student before his name is entered on the examination list, as an earnest of his intention to offer himself for examination on the days appointed. Should the student fail to attend on the days of examination, the money so deposited will be forfeited, and his name will be removed from the list of students. Otherwise, the amount will be refunded after the examination.

Days and Course of Examination.—Class II.—The examinations under sub-classes 1 and 2 will be held concurrently on three consecutive days, commencing with the first Tuesday in the month of April. A fourth day will be devoted to practical work in the field, and a fifth to plotting and drawing the field-work under the superintendence of one of the examiners. The examination under sub-class 3, so far as relates to the first three subjects under the sub-class, will be held concurrently with those under sub-classes 1 and 2. The other subjects under sub-class 3 will be taken during the Tuesday, Wednesday, and Thursday of the week following.

Examination Standards.—Class I. (*Students' Preliminary.*)—The maximum number of marks in Class I. (Students' Preliminary) will be 500. The minimum number of marks to qualify the pupil to a certificate as a student will be 300.

Class II. (*Students' Proficiency.*)—The maximum number of marks in each of the sub-classes 1, 2, and 3 will be 1,000. No student will be held to have passed the examination who has obtained less than 500 marks.

Scholarships and Prizes.—Class II.—The Institution will give a prize of £25, to be called "The Institution Prize," to the student who obtains the greatest number of marks, over 500, in the proficiency examination in sub-classes I., II., or III.

The Institution Scholar.—To signalise conspicuous merit, a medal and the title of "Institution Scholar" will be given to the student who obtains the greatest number of marks, over 900, of any of the students examined in sub-classes I., II., and III.; and the name of the student so distinguished will be permanently recorded on the walls of the lecture-hall. The members of the council will give the candidate who succeeds in earning the distinction of "Institution Scholar" an opportunity (free of charge) of acquiring practical experience, for a period not exceeding 12 months, in a London office. A medal will be given to any student obtaining 900 marks in any of the sub-classes.

Sub-Classes I., II., and III.—A special prize of £20 will be given to the student (not being the "Institution Scholar" or the winner of "The Institution Prize") obtaining the greatest number of marks, over 500, in each of the sub-classes I., II., and III.

President's Prize.—A prize of £15, to be called the "President's Prize," will be given to the student who passes the best *vivâ voce* examination in some subject, to be announced six months previously. It will be open to all students to compete for the "President's Prize," providing they give notice of their intention to do so at the same time that they signify the sub-class under which they desire to be examined, in Class II. The name of the winner of the Institution Scholarship, and those of the prize winners in the various sub-classes of Class II., will be announced at the annual general meeting, and the prizes will be publicly presented to the successful competitors at that meeting. Rules regulating the conduct of the various examinations under class II. will be previously published.

Class III.—Professional Associates' Qualifying Examination.—Should a sufficient number of professional Associates signify their wish to qualify themselves as members by passing an examination under Class III., the council will make arrangements for holding an examination of the kind; but examinations under this class will not be held more than once in two years. No professional Associate will be held qualified to enter his name for examination under Class III. unless he shall have been at least ten years employed as a paid assistant, beyond the period of his articles, and unless so employed before the 31st of May, 1880; but the time shall be reduced to five years in the event of his having passed the examinations in Classes I. and II. Professional Associates who wish to qualify as members under Class III. will be required to pay an examination fee of three guineas.

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THE PARKES MUSEUM OF HYGIENE.

A PUBLIC meeting was held on Tuesday afternoon at the Egyptian Hall of the Mansion House, under the presidency of the Lord Mayor, in connection with the first anniversary of the Parkes Museum of Hygiene, temporarily established on the upper floor of University College, Gower-street, W.C. The museum was founded as a memorial of the late Dr. E. A. Parkes, latterly of Netley Hospital, the distinguished sanitary reformer and physician, who died in the spring of 1876. The council of University College courteously placed rooms at the disposal of the committee, until a permanent home could be secured. The articles exhibited are arranged in the following groups—viz., engineering and local hygiene, architecture, furnishing, clothing, food, and preservation and relief; and to these is added a library. All departments of the State have afforded cordial assistance to the institution, the Admiralty and the War Office sending books and other material, the India Office contributing their sanitary reports, and the Education Department, the Local Government Board, and other offices making equally valuable contributions. Private donors and inventors have rendered important help, and the museum is now becoming a central institution for the instruction of the public, where not only professional men, but owners of property, employers of labour, manufacturers, artisans, and other persons, both men and women, may study at their leisure the subjects in which they are most interested. The financial state of the museum is scarcely satisfactory, and it was mainly to aid it in that respect that the meeting was convened.

Dr. G. H. Poore, the hon. secretary, before reading the report, mentioned that he had received a letter from the Home Secretary (Sir W. V. Harcourt), evincing much interest in the museum, as conducing to the better knowledge of the important subject of sanitation, on which the health of the community so much depended. The report stated that the museum was formally opened to the public on the 28th of June, 1879, by the then Home Secretary, and the first year had been one with which, in many respects, the committee had a right to feel satisfied. The museum had been open to the public on three days in each week, and since the 1st of January, 1880, the number of visitors had been 2,166. During the past winter a series of demonstrations were given on Saturday afternoons by members of the executive committee. The first series, by Professor Corfield, Drs. Steele and Poore, was given for the benefit of members of the Working Men's Club and Institute Union, and comprised the subjects of house drainage, ventilation, lighting and warming, food, and the management of the sick-room. The second series, by Professor Corfield and Mr. Rogers Field, was given to members of the Institution of Builders' Foremen and Clerks of Works, and comprised the subjects of ventilation and house-drainage. Both series were numerously attended. The museum had also been used by the students of the College, by hospital nurses, and others. The committee would gladly entertain applications from persons engaged in tuition who might wish to bring their pupils to the museum for the purpose of practical instruction. They trusted that the generous example of some of the City companies might be followed by others of the ancient City guilds and the wealthy citizens of London. The different sections of the museum had been considerably enriched during the past year, the only section which had shown no tendency to expand being that devoted to clothing, notwithstanding that the subject, in our variable and often trying climate, was one of prime importance. The provision of a new home for the museum had already become a necessity, and the removal of the collection to a building specially designed for it in some central position would prove a great benefit to the museum and a great boon to the public. As to the financial position, since the spring of 1876 £1,285 had been subscribed. Of that £641 had been expended in museum fittings, in paying the salary of a curator, and in other unavoidable expenditure; £600 had been invested, which yielded an income of something less than £24 per annum, and the treasurer had £65 in hand. The museum was free in every respect. No charge was made to visitors at any time, nor for space, suitability being the only condition for the acceptance of any object. Thus the museum was entirely dependent upon voluntary contributions. The executive committee were determined that the institution should remain a true museum, and not become a mere show-room for manufacturers and patentees. To achieve that object a permanent home for the museum must be found, and a sufficient sum provided to meet the annual expenditure. The committee confidently appealed to the public for the necessary funds.

Earl Fortescue, in moving as the first resolution, that the annual report afforded conclusive evidence that the Parkes Museum of Hygiene was meeting a great educational want and was eminently worthy of public support, said that sanitary reform was well worthy of far greater sacrifices and efforts than had yet been made in its behalf. Disease, vice, and crime were concurrent, and want of proper sanitation not only produced disease, but encouraged immorality and crime. Among the movements in promoting sanitary reform the Parkes Museum took a high place, for hygiene, the object of which was the preservation rather than the restoration of health, required some such institution as that to show what had been, was being, and could be done in its behalf.

Mr. G. Palmer, M.P., in seconding the resolution, referred to the important part played by ladies in disseminating a knowledge of sanitary principles and requirements.

The President of the Royal College of Surgeons (Mr. Erichsen), in supporting the motion, said the institution was especially valuable to managers of hospitals and to members of the medical profession in giving them an opportunity of studying practically the appliances and mechanism by which disease could be prevented and health restored. The highest surgical skill might be rendered nugatory unless combined with the highest hygienic appliances. There were diseases of a most fatal character which might be generated in hospitals by want of sanitary precautions, but which were entirely and absolutely preventible if the proper hygienic means were taken. The first use of such a museum was, however, the prevention of disease rather than the restoration to health.

Mr. Erasmus Wilson, F.R.S., also supported the resolution, and said the museum was an eminently practical mode of promoting the knowledge of sanitary laws. Most people knew something of the theory of hygiene, of the importance, in an abstract sense, of good air and water, of warmth and ventilation, but the difficulty was how to adopt these in their own houses, and what appliances were or were not conducive to health. If they felt dubious as to the drainage, they did not know what to do to remedy it, or to whom to apply—in short, to what shop to go. In this museum all the most recent appliances could be compared and examined, and by these and the library, all the advantages of sanitary science were brought within reach. Turning to the particular branch of surgery with which his name is associated, he showed that the most harassing scourge of schools, ringworm, could be swept out of society if plenty of air, proper food, and sufficient warmth, were provided.

The resolution was then put and carried unanimously.

Sir William Jenner, in proposing a vote of thanks to the Lord Mayor, after referring to the lovable character and the professional eminence of the late Dr. Parkes, whose name the museum bore, said the lectures to working men in the museum were valuable as teaching them to improve not only their own homes, but the homes of every member of the community. It was not only the houses of the poor, but the great mansions of the rich, which required looking after in a sanitary sense. In his practice he found wives and mothers weeping for sick and dying relatives, whose illnesses, and probable deaths, were entirely due to a neglect of ordinary sanitary precautions. The task of teaching workmen to build houses properly and healthily was neither more nor less important than the due attention of the inmates to the sanitary state of their own dwellings. He described the sanitary condition of one of the finest mansions in London, to which a wealthy patient of his would have been removed had he not recommended an examination of the premises, which revealed the fact that the bath-room pipes descended into the soil-pipe unventilated, most of the closets were unventilated, and the overflow-pipe from cistern passed direct into the drain. He also instanced the difficulty he had experienced in bringing his own home into a sanitary state. Three times he had the drainage overhauled by tradesmen of respectability, and found that the otherwise intelligent foreman he employed on the last occasion needed supervision at every stage, so ignorant was he of the simplest principles of hygiene. As to the Parkes' Museum, it was not intended as a charity, unless it was that charity which began at home, and if they, through the museum, supported and assisted sanitary science and knowledge, he felt sure that home was the place where it would first practically commence. Many a man's want of health was simply due to the vitiated air he breathed, and to this cause most of those very common ailments—sore throats—were attributable. He concluded by earnestly commending the museum to the practical support of the meeting, and of the public at large.

The vote of thanks was seconded by Mr. George Godwin, supported by Sir J. Fayrer, and carried unanimously, and the Lord Mayor having suitably replied, the meeting broke up.

THE GROWTH OF TREES.

SIR ROBERT CHRISTISON read a paper last week, before the Scottish Meteorological Society, advocating the institution of an inquiry by the Society into the relation of climates in Scotland to the growth of trees. Doubts had, he said, been occasionally thrown out as to the uniformity of the law in regard to the growth of trees being marked by annual layers or rings of wood, but he had never himself met a clearly exceptional case; and although it was true that these annual rings presented great differences in width, it appeared to him that exceptions to the ordinary course must be so very rare as scarcely to interfere with any practical application that might be made of the general rule. As indicating the valuable results that might be obtained from the proposed inquiry, Sir Robert stated what he had himself observed last autumn in the wood of Dull. In this wood, he said, his attention was principally directed to the larches, which, taking the average of the most favoured localities, had, he found, grown during their first thirty-three years at the rate of one inch in radius in seven years. Taking this growth, and comparing it with the growth shown in a section of a larch from the Glamis grounds, which measures 12ft. in girth, and which was 110 years old, he found this—that in the Glamis larch there had been a growth of an inch during three years and a-half for the first thirty-two years, and that it was, therefore, presumable that though the trees at Dull now looked healthy enough, they had ceased to grow at a profitable rate. He also described the different measurements which he had last year obtained in Drummond Hill Wood, stating that at the foot of the hill he found the larches measuring about 85 feet in height, and 4 feet 10 inches in girth; that as an ascent was made the trees became smaller; but that when a height of 800 feet above sea-level had been reached, a flat shelving piece of deep-soiled ground was come upon, where the trees were better grown than anywhere else, measuring 115 feet in height instead of 85 feet, and 7 feet 10 inches in girth in place of 4 feet 10 inches.

LONDON BRIDGES.

IT will be a surprise to most people, remarks the Echo, to learn that, after paying £1,373,325 to free the toll bridges over the Thames, the Metropolitan Board of Works finds the bridges in such a condition as to require the expenditure of £640,000 to make them safe. Yet this is what transpired at the meeting of the Board last Friday. It is no answer to the cry of disappointment that is certain to arise to say that the expenditure will be spread over a number of years; it will have to be borne by the ratepayers, whether it is one year or twenty. Sir Joseph Bazalgette, the engineer, has presented an elaborate report, in which he describes the condition of the nine bridges (excluding that at Deptford), which demand the enormous expenditure we have named. Two of them—namely, Battersea and Putney—will have to be rebuilt, the former at a cost of £250,000, and the latter with the approaches costing £300,000. The case of Waterloo-bridge is the most curious. Soundings which have been made of the bed of the Thames since 1823, when the celebrated architect of the Menai Suspension-bridge, Telford, took the soundings, have established that the scour is continually deepening the bed of the river. Waterloo-bridge was built in 1814, upon a timber staging resting upon piles 20ft. long, and the masonry was carried to a depth of 5ft. below the bed of the river. The result of the scour has been that the heads of these piles are now from 1 foot to 6ft. above the bed of the river, and are visible at low water. If the foundation between the piles should be washed out, the structure would inevitably sink. The engineer now proposes to put wrought-iron cylinders round each pier, and to fill up to the level of the foundations, so as to make a solid foundation right down to the piles. These works are estimated to cost £40,000, and they were ordered on Friday by the Board. Vauxhall-bridge is in pretty much the same condition, and here it is proposed to convert the three central arches into one opening, and to dredge out, so as to get an adequate area of waterway, besides putting down similar caissons to those recommended for Waterloo; estimated cost £45,000. The Lambeth-bridge is decaying; from 5ft. of the cable 9lb. weight of rust has been removed, of which about 42 per cent. was pure iron. The Albert Suspension Bridge, "if loaded on one side, will depress where loaded, and rise where not loaded." A part of Battersea-bridge overhangs as much as 9ft., and the stumps of the piles are in a ruinous condition. Wandsworth-bridge has suffered for want of cleaning and painting. Putney-bridge, which is 151 years old, is in a little better condition than Battersea, and is a serious obstruction to the navigation. Of Hammersmith-bridge it is remarked that it will become a matter for serious consideration whether wrought-iron should not be substituted for the cast-iron cross-girders under the roadway. The Board have resolved to seek Parliamentary powers for such portions of the foregoing projects as they have not power at present to carry out, and for the mending of this bad bargain of the Board the ratepayers will have to pay what will be equal to a single rate of 6½d. in the pound.

THE CHANNEL TUNNEL.

AN excursion was made a few days ago by M. Léon and M. Varroy, the Minister of Public Works, accompanied by M. Ribot, Deputy, and Fernand Raoul-Duval, civil engineer, to Sangatte, near Calais, for the purpose of visiting the soundings which have been undertaken by the Submarine Tunnel Company between England and France. The excavations have been commenced at some distance from the village, at a spot where the cliffs have an altitude of 70ft. above the level of the sea at high water. A point has been chosen where the rocks of grey chalk which have to be traversed by the tunnel come to show their heads at the surface of the soil. On the opposite shore similar borings have been, as is known, begun, so that the works are proceeding simultaneously.

The soundings that have been made during the last few years demonstrate that the base of the Channel consists of a compact mass of chalk, resting on banks of slate. This mass, which is easy enough to pierce, is said at the same time to sufficiently resist infiltration. It would, therefore, present a substance excellently adapted for perforation. But what yet remains to be proved is whether the succession of these chalk layers will not disclose some irregularities or ruptures which would render the enterprise impossible. That is why, before commencing the definitive works, it was necessary to make an attentive study of the ground by means of trial excavations. It is now five years since the company which had obtained the concession for the tunnel began the first borings at Sangatte. But only since last year have the works been prosecuted with any activity.

The chairman of the company was originally M. Michel Chevalier, but since his decease the place of the great economist has been taken by M. Léon Say. The period allotted for the trials was not to have exceeded five years; but as, according to the terms of the concession, the Government was authorised to prolong this term by three years, the Minister of Public Works did not hesitate to accord this extension. However, before making a formal engagement, M. Varroy wished to examine for himself what had been done. The shaft has now reached a depth of nearly 200ft., or about 130ft. below the level of high water. It has a width of 10ft., and is lined with oak, so that the water cannot penetrate very freely, not more than 17 gallons a minute. This water is not salt, which is thought to prove that the layers hitherto traversed have their point of contact sufficiently far from the shore to prevent the sea from ascending the shaft. It is intended to sink to a depth of 300ft., and then a gallery will be excavated in the direction England. Up to the present the engineers are highly satisfied with the results obtained, as no irregularities have been discovered, which is considered a good augury for the success of the enterprise.

Unfortunately, with the greatest exertions on the part of the engineers, it is impossible to proceed at a quicker rate than twenty inches a day. Nevertheless in eighteen months or two years enough progress will have been made to arrive at a perfect understanding about the possibility of the undertaking. It is stated that the work will not fail through lack of funds.

CHIPS.

The patrons of the Watson Gordon fine art professorship in Edinburgh University, have elected Mr. Gerard Baldwin Brown, M.A., of Oxford University, the son of a well-known Congregational minister of Brixton, as the first occupant of the chair.

A new front of open carved oak-work has just been placed before the sedilia standing in the sacrarium of St. Andrew's Church, Plymouth. It has been designed by Messrs. G. G. and J. O. Scott, and made by Mr. Harry Hems, of Exeter.

The new parsonage-house of St James's, Darlington, was last week inspected and approved by Mr. Ewan Christian, architect to the Ecclesiastical Commissioners. The architect of the building is Mr. G. G. Hoskins, F.R.I.B.A., of Darlington.

A new fountain in Laura-place, Bath, was recently unveiled. It is Italian 13th-century Gothic in style, and consists of three basins, the materials used being Portland stone and Westmoreland Shap granite. The architect is Mr. A. S. Goodridge, of Bath. Messrs. Farmer and Brindley, of London, executed the carving. Mr. Ambrose, of Bath, carried out the masonry and concrete work, and Mr. Sydenham the plumbing. The cost has been £600.

A new cemetery at Snydale, near Wakefield, was recently consecrated. The area, which measures 458ft. by 207ft., is inclosed by a 5-ft. brickwall. The Episcopalian and Nonconformist chapels are exactly similar, and are each 25ft. by 18ft., and 18ft. high, with open-timbered roofs, and, like curator's house, in which is a large board-room on first floor, are built of red bricks, with freestone facings. Mr. George Malcolm, of Pontefract, was the architect to the burial board.

The Norfolk and Suffolk county justices have decided to rebuild the Falcon bridge at Bungay in iron, from the plans of Mr. Brereton, county sur-surveyor for Norfolk, at an estimated cost of £1,700.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Essex Archæological Society.—The annual excusion of this society was arranged for Wednesday week, to be held at Saffron Walden and Audley End. The annual meeting was held at 10 a.m., at the town-hall, Mr. G. Alan Lowndes in the chair. The twenty-eighth annual report, read by Mr. H. W. King, the secretary, stated that there was a balance in hand of £102 7s.; and attention was called to the frequent loss and destruction of sepulchral monuments and painted glass during church-restoration. Recently valuable 14th and 15th-century glass had been abstracted from Rochford Church, and monuments from South Weald Church, where one of the abstracted brasses had been publicly advertised by a private possessor; indeed, the secretary reported that, in six instances in which application had been made to him by historians and descendants of families, he was obliged to reply that the monuments inquired for were destroyed during the progress of church-restoration. The council therefore pointed out the necessity of keeping a vigilant eye on the church-restorer, and endeavouring to keep these valuable records of the past from demolition, abstraction, or concealment. Mr. Wiseman, of Paglesham, having been elected a member of council, in place of the late Mr. G. H. Rogers-Harrison, H.M. Windsor Herald, the report was adopted. The secretary read a paper by Mr. Joseph Clarke, F.S.A., descriptive of a large collection of Celts, found in the neighbourhood; the writer expressed the opinion that these were Roman in origin, and were used by that people for undermining walls, in moving the heavy materials of fortifications, and for gardening and agricultural purposes—a theory dissented from by Mr. Nichols and other speakers. The members then made a perambulation of the town, visiting the timber-built and plastered premises in Church-street, formerly the "Sun Inn;" the piece of wall, 10ft. thick, and 30ft. high, and the traces of ditches, which constitute the only remains of the castle; and the museum, where Mr. Joseph Clarke acted as guide. At the church Mr. C. Forster Hayward, F.S.A., delivered a lecturette, describing it as a fine example of a Perpendicular church of the time of Henry VII., but probably not finished till the reign of Henry VIII. The panel-work under the windows of the north aisle was adverted to, the Rev. G. E. Jelf suggesting that this and traces of similar work now destroyed on the south aisle, marked the position of former side chapels. Mr. Jos. Clarke pointed out in the spandrels of the arches there were eight saffron buds arranged so as to form wheels. Mr. Hayward called attention to the traces of a rood-loft to the fine south door, and the Audley tomb and its chapel, c. 1544, and deplored the great loss of brasses from the church. The visitors next went to Myddleton-street, where was seen a malting with overhanging story, and windows having sills moulded out of one piece, moulded mullions and traceried heads, and in adjoining house was examined a specimen of tapestry descriptive of English rural life and industries. After luncheon, the temporary collection of antiquities displayed in the town hall was examined, and also the corporation charters and books in the muniment-room. At Mr. G. S. Gibson's house a paper on "The Ancient Cemetery at Saffron Walden," was read by the Rev. H. Eckroyd Smith, who stated that on Mr. Gibson's grounds had been found immense quantities of skeletons, bushels of badly-tempered Romano-British pottery, some Samian ware and iron, bronze and pewter objects, some of which were exhibited. The day closed with a visit to Lord Bradbrooke's mansion at Audley End, where Mr. C. F. Hayward read a paper, in which he traced its history of the building, which was built by Baron Howard de Walden on the site of a Benedictine Abbey given him by Henry VIII. The design had been called Italian, but the features showed distinctly that it was an English design, the outcome of the modes of building common to the country during the preceding century. Time scarcely permitted the visitors to examine the museum in the mansion founded by the late Lord Braybrooke, and the ancient armour, tapestry and other fittings of the state apartments.

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A new and permanent theatre of brickwork is about to be built at Mount Pleasant, Bilston. Mr. Edwin, of that town, is the builder.

COMPETITIONS.

Fulham New Infirmary.—The Fulham board of guardians last week re-discussed, in detail, the arrangements for this competition. The resolution limiting the competition to six selected architects was rescinded; and it was further decided to offer 100 guineas as first premium and 50 guineas as second, these designs to become the property of the board. The commission to the architect for the building itself was fixed at 5 per cent. up to £20,000, and 2½ per cent. on any outlay beyond that sum. Mr. Sanders, of King-street, Chelsea, was appointed to supply the levels, at a fee of 10 guineas, motions to make the fee 5 guineas and to leave the matter to the competitors being defeated. It was decided that the surveyor and clerk of works be nominated by the architect, but appointed by the board; and that the new building must afford accommodation for 360 patients, exclusive of separate arrangements for lock and other special cases. The chief discussion took place with reference to the suggested appointment of a professional referee, the chairman and others thinking that the duty of selection could be very well performed by members of the board; but ultimately it was decided "That an eminent architect (such architect to be a member of the Royal Institute of British Architects) be called in to assist the board in deciding how far the plans submitted conform to their requirements, and also as to their relative value."

St. Matthias' Church, Tulse Hill, Competition.—Since our review of these designs was in type we hear, just as we are going to press, that another meeting of the building committee is to be held to-day, to reconsider the decision as to the relative position of the five selected designs.

SCHOOLS OF ART.

Newton Abbot.—A public meeting was held at the town-hall on Tuesday evening, when it was agreed to make arrangements for the formation of a school of science and art. The Rev. H. Tudor, rector of Walhorough, who presided, reminded the meeting that the school of art previously existing in the town took a very high position at South Kensington, and he remarked that he could not help thinking that, in a town with a population of between nine and ten thousand, there must be many young people desirous of taking advantage of a knowledge of science and art. They lived in the centre of the clay-works of South Devon, and as they saw hundreds of cart-loads of clay going through the town to all parts of the world, the thought must have struck many of them that some of that clay might be turned into those beautiful things which they sometimes saw in the shop-windows. There were also a great many young men connected with their railway-works who had no place where they could spend a quiet and intellectual evening, and he thought a school of science and art would supply such a place; which was another reason why such a school should flourish there.

PARLIAMENTARY NOTES.

The Tay Bridge Bill.—The Select Committee appointed by the House of Commons to inquire into the North British Railway (Tay Bridge) Bill, met again on Wednesday. The Committee having heard the concluding arguments on both sides, retired to consider the questions submitted to them. After an absence of half an hour they re-entered the room, and the Chairman stated that, after a careful and anxious consideration of the four points submitted to them, they had come to the conclusion that it was expedient to rebuild the bridge, that the proposed site was the most suitable that could be selected, and that the bridge would be no interference with the navigation of the river. As to the most important of the four points—the safety and the security of the public—the Committee felt that they were not justified in giving their sanction to the scheme of reconstruction proposed in the Bill before them (applause). The Committee would report more fully to the House of Commons, and would probably give the reasons which induced them to come to this decision. The decision of the Committee was unanimous. In reply to a suggestion from Mr. Clerk, the Chairman stated that the matter was now out of the hands of the Committee. If the decision of the Committee had been different they could have recommended that three independent experts should be appointed to make tests of the existing works. In view of the introduction of another Bill next Session, it would be well for the railway company themselves to proceed with the requisite tests as soon as possible.

The Inner Circle Railway.—The Bill for the completion of the Inner Circle Railway was rejected by the House of Commons on Tuesday. A Select Committee had amended the measure, but they had failed to eliminate its most objectionable feature, the retention of which has proved fatal to the scheme. By the terms of the Bill it was proposed that the Metropolitan and District Railway Companies, in constructing the remaining link between Cannon-street and Aldgate, should have power to "burrow" beneath the houses and streets, giving compensation only in those cases where the basements of the buildings were interfered with, or where actual damage accrued within a given period. Such a proposal naturally excited the strongest opposition among the owners and occupiers of property along the line of route. The Select Committee, it is true, passed sundry resolutions which, while they slightly modified the operation of the clauses, virtually conceded the extraordinary powers which the Companies demanded. The arguments in defence of the Bill were not without their weight, but something weightier still was necessary to reconcile Parliament to such an innovation as was thus proposed. The enormous expense of buying up the property along the line of route was given as a reason why the Companies should be allowed to "invade the freehold" and pay nothing for the privilege, unless they inflicted positive damage. But the extreme value of the property at stake furnished a stronger reason why a just principle should not be violated. The measure just rejected is a substitute for an Act passed last Session, whereby it was arranged that the railway should be constructed under a line of thoroughfare, partly new, and towards that scheme the Metropolitan Board agreed to contribute half a million sterling, in addition to a quarter of a million from the Corporation.

CHIPS.

At the recent meeting of the Royal Historical and Archæological Society of Ireland, held at Dublin, the collection of Irish antiquities, collected by the late Mr. Edward Benn, of Glenravel House, Co. Antrim, was formally presented to the Belfast museum. It includes some 400 ancient beads, found in counties Down and Antrim, a small bronze altar-vessel, having upon it an inscription in the square Irish character, "Pray for Martin O'Bralachain," supposed to be the erudite Professor of Divinity, of that name, at Armagh Abbey, who died in 1188, a brazen dish and crucibles from a cranog, and many tokens.

Extensive additions and alterations have been made to Messrs. Leatham, Tew, and Co.'s West Riding Bank at Pontefract. Messrs. J. Neill and Son, of Leeds, were the architects, and Messrs. Beanland, of Bradford, the contractors.

The Lord Chancellor has added the name of Mr. Thomas Chatfeild Clarke, F.R.I.B.A., to the Commission of the Peace for Newport, Isle of Wight.

The committee of the Young Men's Christian Association have requested Mr. A. Pite, Messrs. Searle, Son, and Hayes, and Mr. Charles Bell, to prepare designs in competition for the adapting of Exeter hall for the purpose of the association.

On Thursday, the 22nd inst., Major Hector Tulloch, R.E., one of the inspectors of the Local Government Board, held an inquiry at Bilston respecting an application from the improvement commissioners for sanction to borrow the sum of £1,500 for the extension and completion of the town hall, from designs prepared by Messrs. Bidlake and Fleeming, architects, of Wolverhampton. It was stated that the building was proposed to be extended towards Church-street, on land belonging to the corporation, so as to enlarge the assembly-room, and give additional means of entrance and exit. Considerable opposition was offered by ratepayers on account of the local depression in trade, and the consequent decrease of population since the town-hall was built. The inspector pointed out that already a proposal had been sanctioned for adding a free library to the town-hall, and that one addition could not well be made without the other.

St. James's Church, Accrington, was reopened on Saturday by the Bishop of Manchester, after renovation and improvement. The quasi-chancel has been seated with carved oak stalls, with traceried fronts and ornamented bench-ends, a rood-screen of wood and ironwork has been erected, the altar has been raised four steps, the pulpit remodelled, a new lectern added, and a vestry built at the north-west angle of church. The carving was executed by Mr. Riley, of Accrington; the decorations by Mr. Foster, of the same town; the metal-work by Mr. Skidmore, of Coventry; all from the designs of Mr. George Baines, architect, of Accrington.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

INTERIOR OF BANQUETING HALL, OLD COCK HOTEL, HALIFAX.

For a description of this illustration see the review of Mr. Leyland's book, on p. 117.

"BEAUCHENE," FITZJOHN'S AVENUE, HAMPSTEAD.

This house is now in course of erection for Mr. L. M. Casella, from the designs and under the superintendence of the architect, Mr. George Lethbridge, A.R.I.B.A., of 7, Draper's Gardens, E.C., the builder being Mr. William Brass, of Old-street, E.C. The house is faced with red brick, with carved brick panels, and all ornamental parts are of rubbed and gauged red brick. Sills are of Corsehill stone. The house has been planned with great attention to internal comfort and convenience, and contains on the basement floor the usual domestic offices, servants' hall, housekeeper's room, and servants' bath-room. Second floor contains large hall, vestibule, portico, dining, drawing, and billiard-rooms, serving-pantry and store-room, cloak-room, lavatory, and w.c. First floor—4 bedrooms, dressing-room, fitted with fixed wash-basins, bath-room with walls lined with tiles, and fitted with glazed earthenware bath, housemaid's closet, fitted with slop-closet, &c., in white marble, linen-room, and two w.c.'s. Second floor—day and night nurseries, with open-timbered roofs, with store-room adjoining, fitted with sink, &c., nurse's dressing-room, housemaid's closet, w.c., and four servants' bedrooms. Rooms for boxes and water-cisterns are provided in roof, which is covered with boarding and felt, and Broseley tiles. Servants' stairs are formed in Portland stone, the principal staircase being of wood, richly moulded. A lift is provided with communication to each floor. Each room is provided with special means of ventilation, and the halls, passages, and staircases, and billiard-room, and cloak-room, are heated by hot-water-coils. All partitions are of brick, carried on iron girders; all joiners' work is to be of pitch-pine, stained and varnished. Staircase window, screen in hall, and upper portion of windows of principal rooms are to be glazed with stained glass.

CHURCH OF ST. MARY, CAYNHAM.

This church had fallen into such a state of decay—the walls being more than a foot out of the perpendicular, and in many places fractured from foundations to roof; burials had taken place quite close to the walls, and some feet below the foundations—that the church had to be shored up to prevent its falling, and so dangerous was its condition that for some considerable time past it has been closed, and the village school has been used for the services. The works now in progress comprise rebuilding the walls of nave and chancel and east wall of tower, all ancient doors and windows and groins being rebuilt in their original position. On the north side a new aisle, organ-chamber, and vestry are being built. The walls of chancel are being rebuilt with new foundations, the windows being rebuilt in their original position. The chancel aisle wall contains a triple arch, and is in good condition; this interesting feature will be carefully preserved. The wood shingle spire is a new feature, in the place of the modern slate roof. The works are being carried out under the direction of Mr. James Brooks, architect, 35, Wellington-street, Strand, London, W.C.

RESIDENCE, LANGHAM-STREET, PORTLAND-PLACE.

This residence has recently been completed, and is erected on the Portland Estate. The site being limited in area, it was found necessary to carry up the buildings to a considerable height, in order to obtain sufficient bedroom accommodation. The architect was instructed to observe strict economy in regard to the exterior, and to avoid all merely extraneous ornamentation, and he has scrupulously carried out these instructions, trusting to proportion, and first-class materials and workmanship, to give character and comfort to the appearance of the house. The finest red Fareham bricks have been used for the facings, and Portland stone for the porch, and the whole of the windows are glazed with plate-glass. The interior of the house has been finished with every attention to refinement of detail. The house has been erected by Messrs. Lucas Brothers, from the designs, and under the superintendence, of Mr. Thomas Porter, architect, 2, Westminster Chambers, Victoria-street.

CHOIR SCHOOL FOR KING'S COLLEGE, CAMBRIDGE.

The choir school for King's College, Cambridge, has been built to accommodate sixteen boys, whom the college has undertaken the entire charge of. The building contains schoolroom, with lavatory, &c., and a house for the master, the dining-room of which is used for the boys as well as the master. Above the schoolroom and dining-room, a long dormitory is arranged, and each bed is screened off by a partition, which forms wash-stand, dressing-table, &c., and a cubicle is formed by drawing a curtain to inclose the space. The centre of the room has four long presses for the boys' clothes. It is built with red brick and tiles, and stands some little way back from West-road, the paddock in front forming the playground. Mr. W. M. Fawcett, M.A., is the architect.

BUILDING NEWS "DESIGNING CLUB."—VILLAGE SCHOOL.

The selected design for a mixed village school for 100 children, which we publish to-day, is by the author of motto "Alfred." Red brick is intended to be used, with cut and rubbed quoins, jambs, &c. The roofs are covered with tiles, and the earth-closets are arranged in rear at end of playground, which, without a covered way in wet and wintry weather, is by no means a good arrangement.

CHIPS.

Major Tulloch, R.E., held an inquiry at Balsall Heath, last week, relative to an application made by the Local Government Board of that place to borrow £22,000 for works of sewerage. The local board originally intended spending £15,700 on the works, but they now find that the work has been under-estimated, and that the total cost will not fall short of £37,000.

The members of the Presbyterian Church of England at Heaton have determined upon the erection of a new church, with lecture-hall and other buildings, fronting to Tynemouth-road, and have commissioned Mr. J. J. Lish, architect, Newcastle, to proceed at once with the designs, and to invite tenders for the carrying out of the works, with the view of having the contract let, and substantial progress made with their new buildings, before the winter sets in.

A landslip at Passo Martino, near Catania, Sicily, has brought to light a large number of ancient tombs and artistic objects believed to belong to the cemetery of Sineatus, a town on the river Simet, mentioned by Pliny.

On Thursday, the 22nd July, an inquiry was held at the board-room, Rothwell, by J. T. Harrison, Esq., C.E., the Government Inspector, with respect to an application to borrow £4,850 for drainage purposes. There was no opposition to the proposed scheme. The board were represented by Mr. Warren (Messrs. Ford and Warren); Mr. A. T. G. Parkinson, of Albion-street, being the engineer for the proposed works.

Messrs. Watson and Son, of 313, High Holborn, have issued a very useful and comprehensive catalogue of mathematical and drawing instruments, which will be of service to those requiring such articles. The prices are moderate, and the quality of their manufactures may be relied upon.

The foundation-stone of the new mission church at Four Lanes, Wendrou (Carnmeuellis), Cornwall, was laid last week. The new church will be in the Early English style, and will seat 200 persons. The architect is Mr. T. Goodchild, London, and the contractor is Mr. A. Jenkin, Leedstown, Hayle.

Dr. Carpenter (Chairman of the Council of the British Medical Association), Mr. Ernest Hart (Chairman of the National Health Association), and Mr. J. Bailey Denton, C.E., are among the directors of a new company registered last week, which has for its object the practical treatment of sanitation. The name of the company is the "House Sanitary Appliances and Inspection Company," and it will be on the co-operative principle.

Last week a Select Committee of the House of Commons passed the Bill for the construction of a roadway under the Mersey which shall be available for the use of all kinds of traffic between Liverpool and Birkenhead. The total length will be one mile, six furlongs, six and a half chains, and the cost is estimated at £500,000, half of which is guaranteed by the Birkenhead authorities and the Great Western Railway. The Bill has now passed the Committees of both Houses, who have granted seven years for its construction. The engineers are Mr. John Fowler, of London, and Messrs. Low and Thomas, of Wrexham.

The Penzance rural sanitary authority have adopted plans for the sewerage of Marazion, prepared by Mr. W. Dennis, C.E., and estimated to cost in execution £1,200.

The Church of St. Katherine, at Woodlands, a suburb of Frome, was reopened on Saturday week after the restoration and partial rebuilding of the nave. North and south aisles have been added to the nave, with new Early Decorated windows, filled with tinted cathedral glass. The passages have been laid with encaustic tiles, and the flooring beneath the seats has been relaid with wood-blocks arranged herring-bone fashion, and a new organ has been built by a London firm. Mr. J. L. Pearson, R.A., was the architect, and Messrs. J. P. and F. Brown, of Frome, were the builders.

The foundation-stone of a new hydropathic establishment was laid at Baslow, by the Mayor of Sheffield, on Wednesday week. The enterprise is undertaken by a limited liability company, having a capital of £10,000. The site is within a short distance of Chatsworth Park. Mr. S. L. Swann is the architect, and the contractors are Messrs. Armitage and Hodgson, Mr. Ezra S. Cartwright being clerk of the works, and Mr. Hitchin foreman. The total of the contracts amounts, with estimate for furniture, to £15,000.

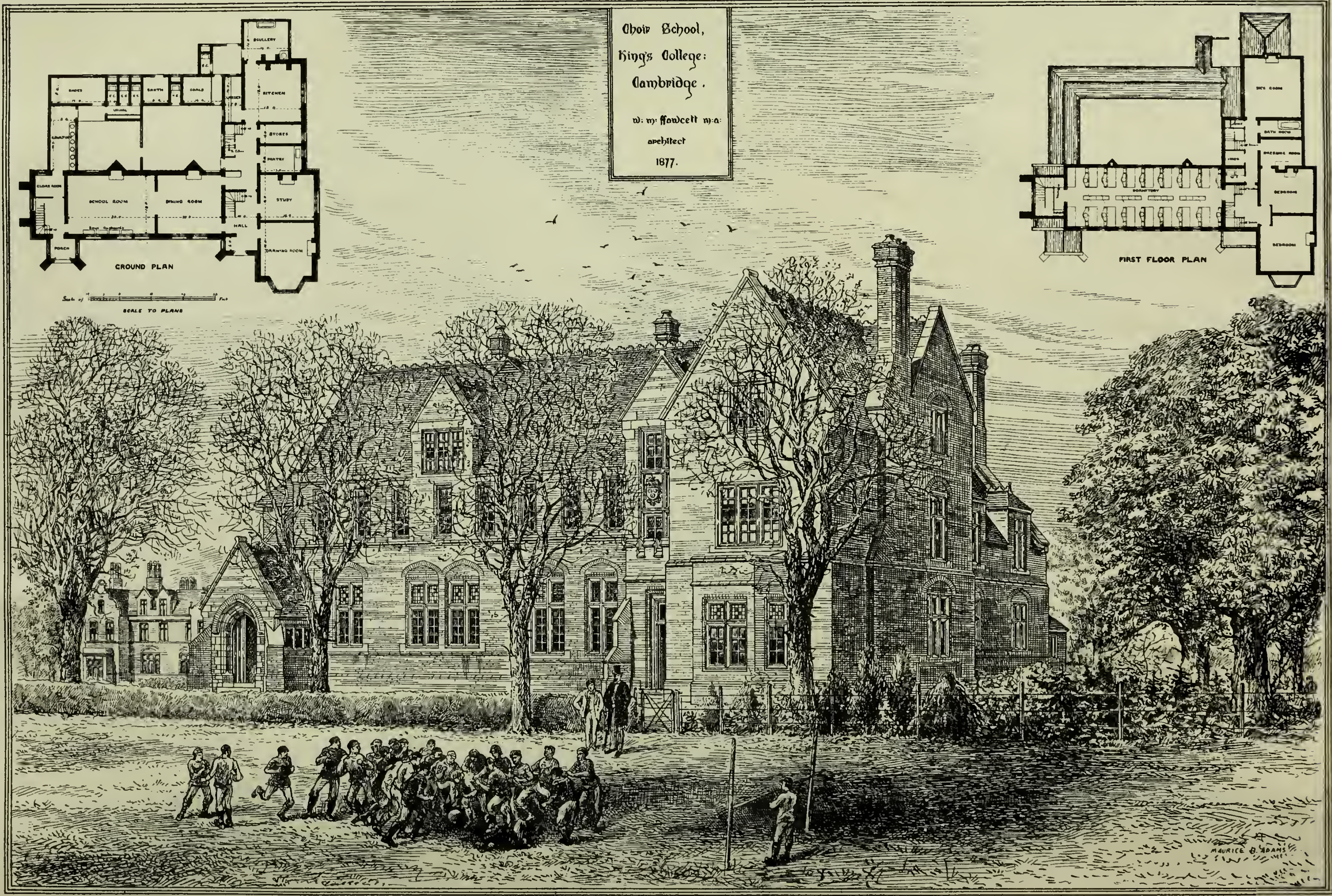
The Settle rural sanitary authority last week instructed Mr. John Hartley to prepare plans for a new cemetery at Austwick.

Of the new school of St. Kenelm, Oxford, opened last week, Mr. Wilkinson, of Oxford, is the architect, and Mr. Wells, of the same city, the builder. Accommodation is provided at present for 50 boys, together with masters' rooms.

New pumping-machinery for the drainage of the Middle Fen district has been set up at Prickwillow, near Ely, and was publicly started on Tuesday week. The district drained comprises 11,000 acres of fen land, receiving the waters of a yet larger area of slightly higher land, and the engine by which the water has hitherto been discharged into the Ouse has proved insufficient in wet seasons. The new centrifugal pumping-machinery has been erected by Messrs. Easton and Anderson, of London, under the supervision of Mr. Carmichael, surveyor to the commissioners, and will raise 74 tons of water per minute to a height of 12ft.

At Hucknall Torkard, on Monday week, memorial stones were laid of a new Wesleyan chapel and school. The contract for building has been let to Messrs. Munks and Richer, at £1,600.

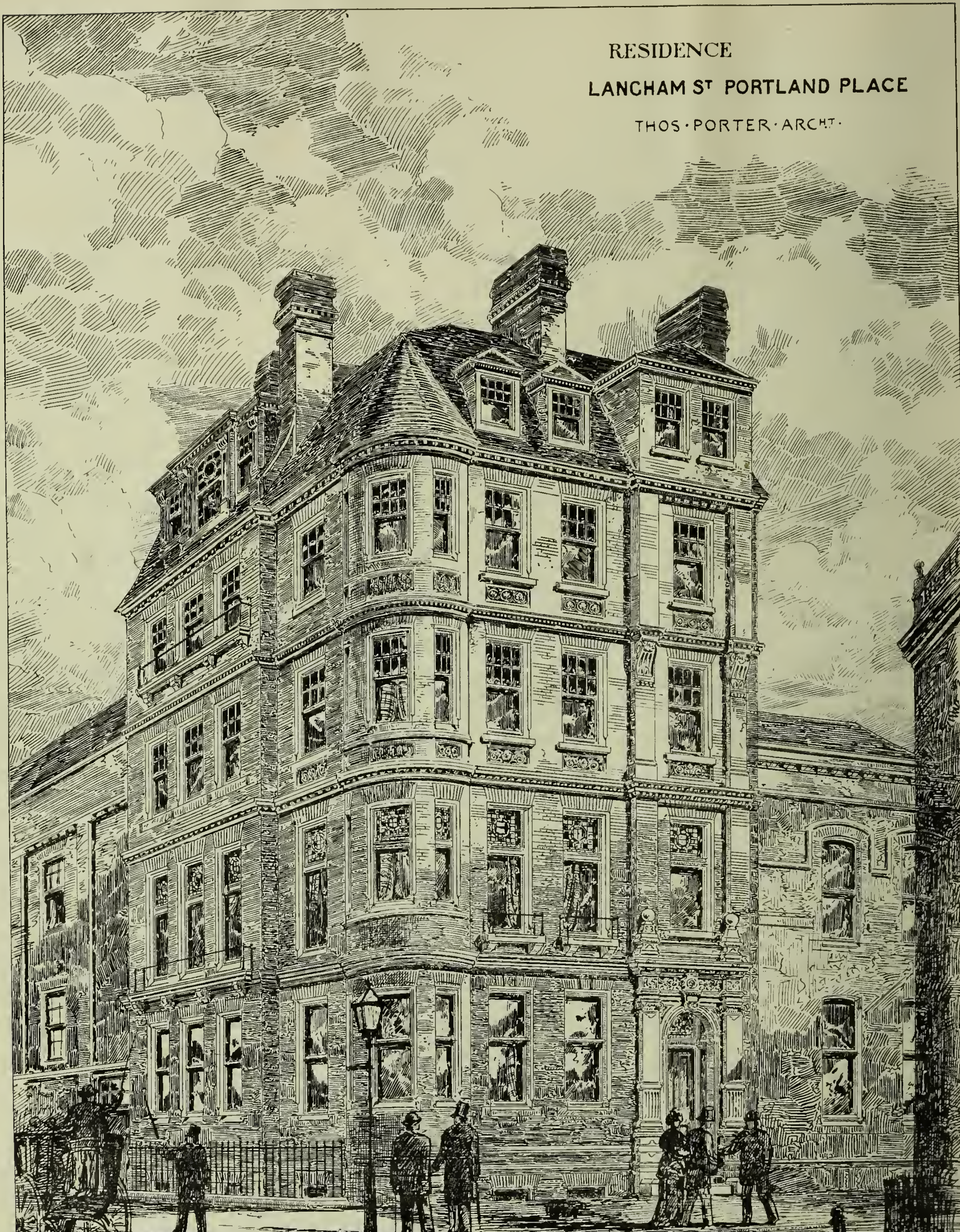
A new drill-hall for the 1st Norfolk Artillery Volunteers, was opened at Great Yarmouth last week. The chief room is 73ft. by 40ft. wide, and at the rear are orderly-room and committee-room, each 17ft. by 13ft. The building is faced externally with brick, and stone dressings; and the interior of the hall is finished with bands of red, white, and blue in brickwork and stucco. All the joinery is of pitch-pine varnished, and the main roof is of the same material. Mr. Arnott, of Yarmouth, was the architect, and Mr. Want the builder.



Choir School,
King's College:
Cambridge.

W: M: ffawcett M:A:
architect
1877.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



RESIDENCE
LANGHAM ST PORTLAND PLACE
THOS · PORTER · ARCHT ·

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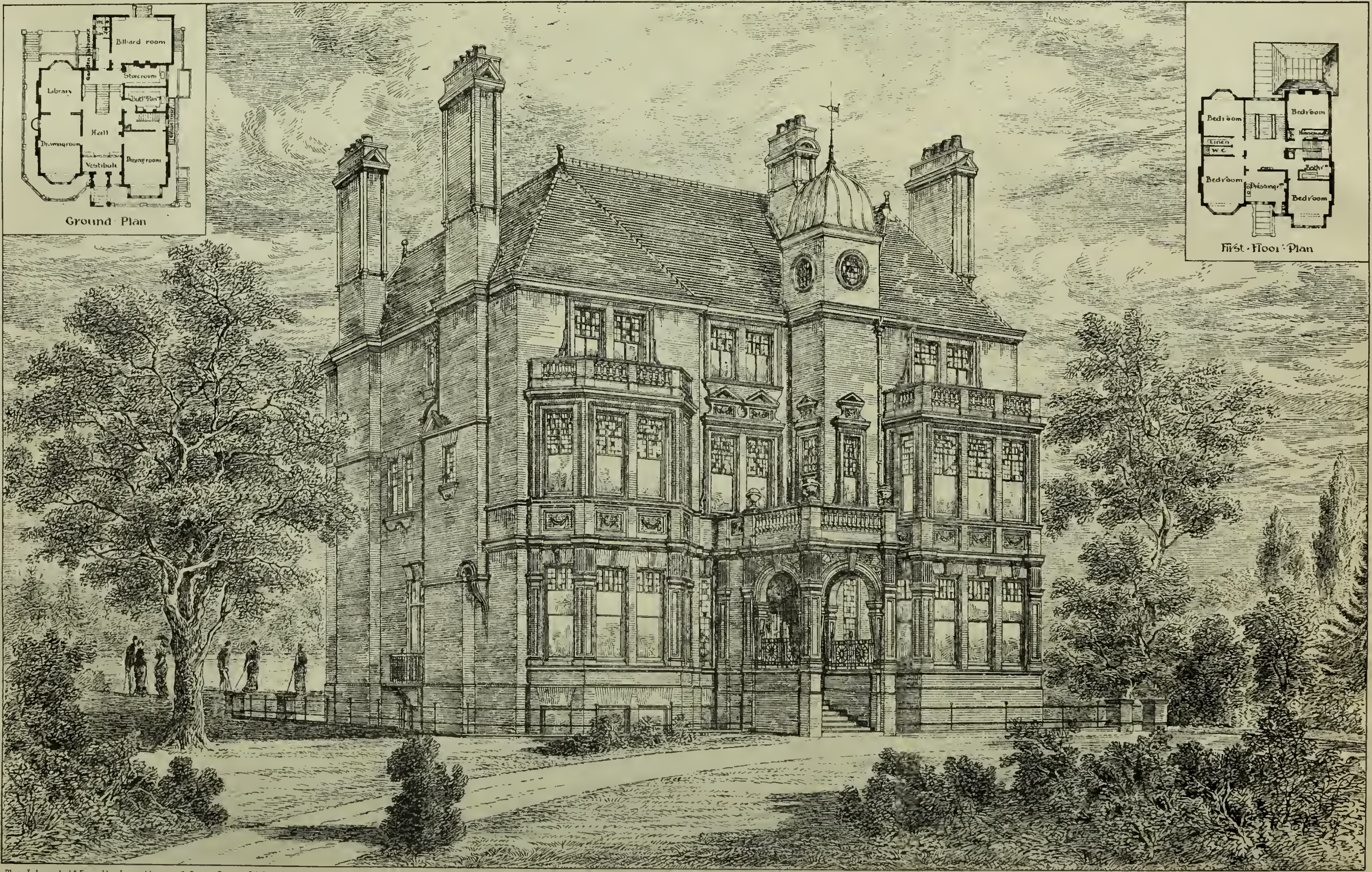

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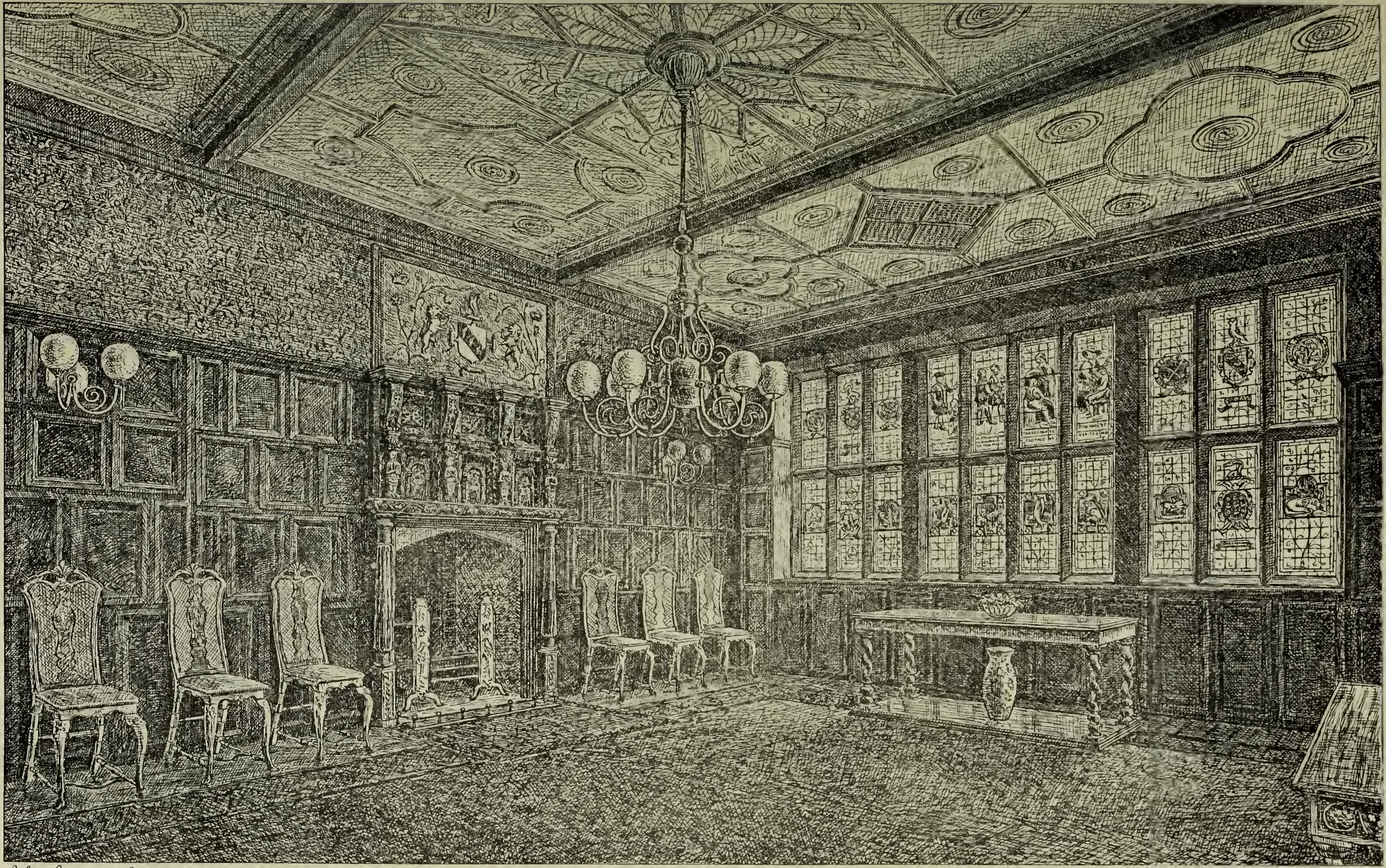
BEAUCHÊNE FITZJOHN AVENUE HAMPSTEAD
GEORGE LETHBRIDGE M.R.I.B.A.
ARCHITECT.



John Leyland, del. 1879.

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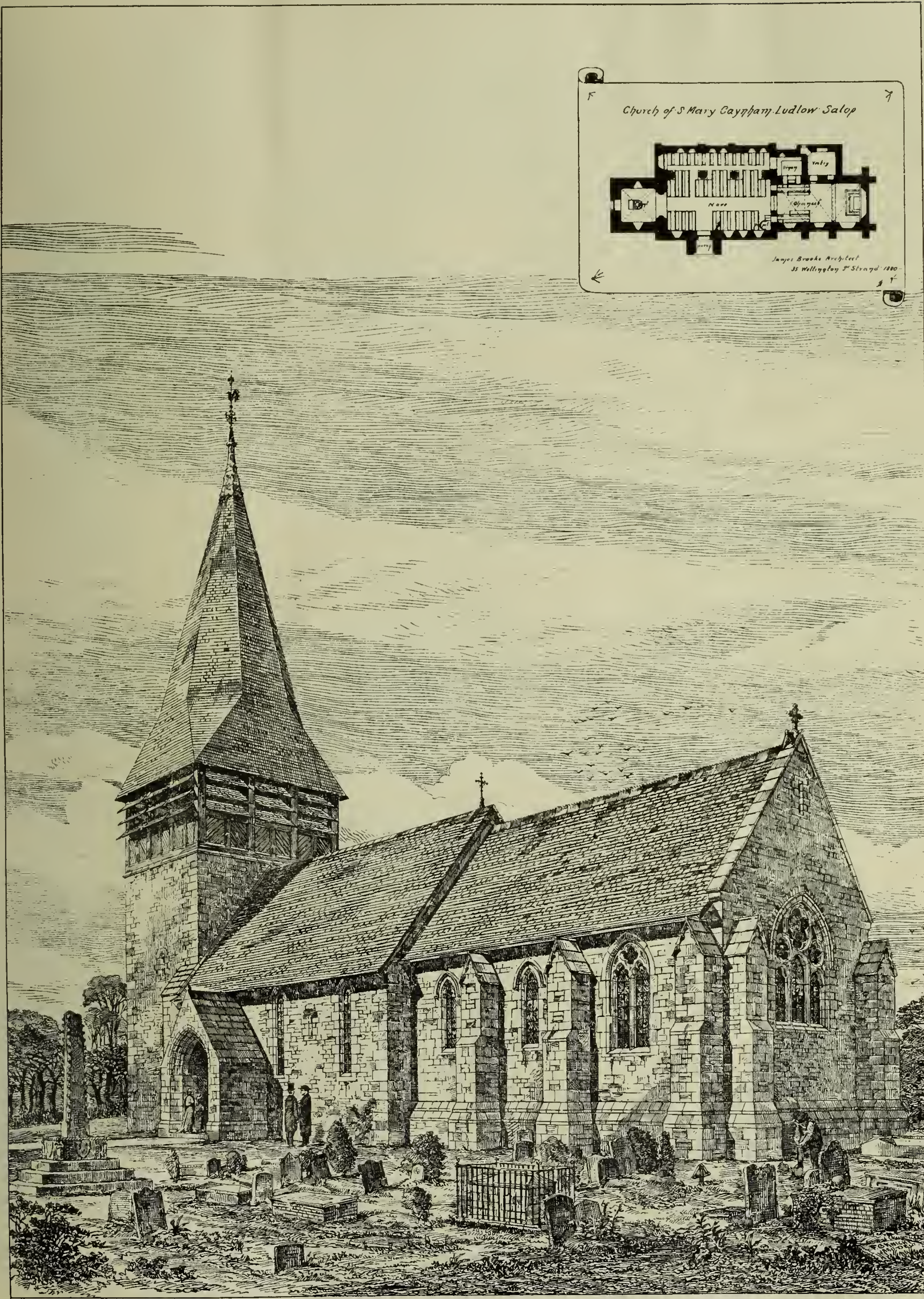
· INTERIOR of the Banqueting Hall, OLD COCK HOTEL, HALIFAX,
As recently restored.


Church of S Mary Caynham Ludlow Salop
Organ
Vestry
Nave
Chancel
Porch
James Brooks Architect
35 Wellington St Strand 1880

Church : of : S : Mary : Caynham : Ludlow : Shropshire : James : Brooks : Architect : London :

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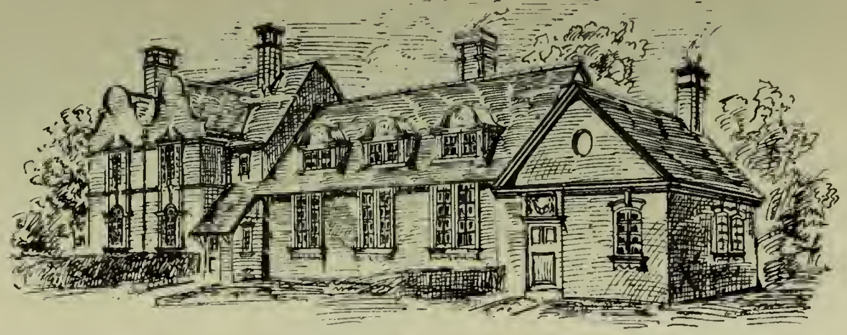
Building News Designing Club:

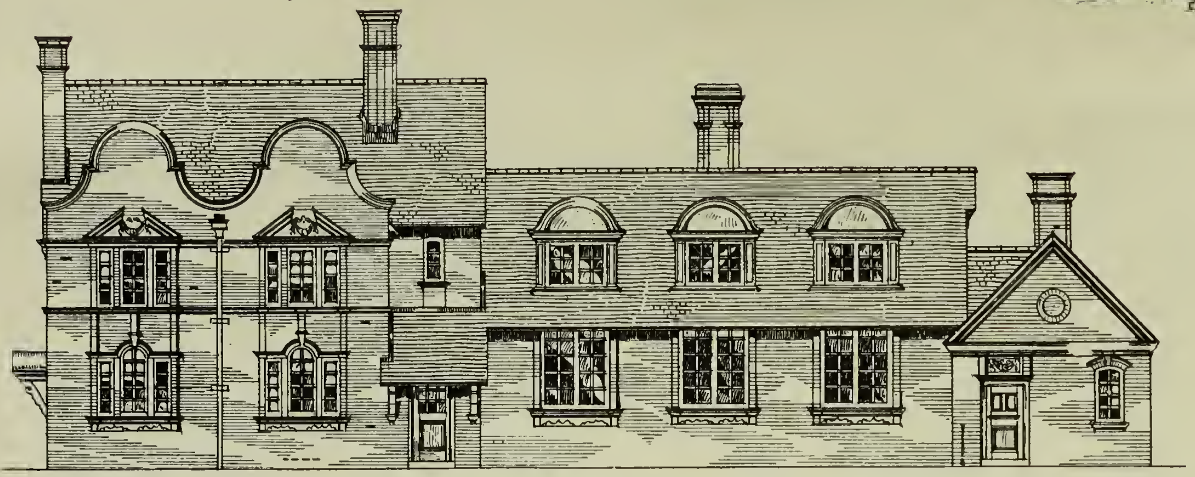
Design for a mixed Village School for

100 children "Alfred"

SELECTED DESIGN

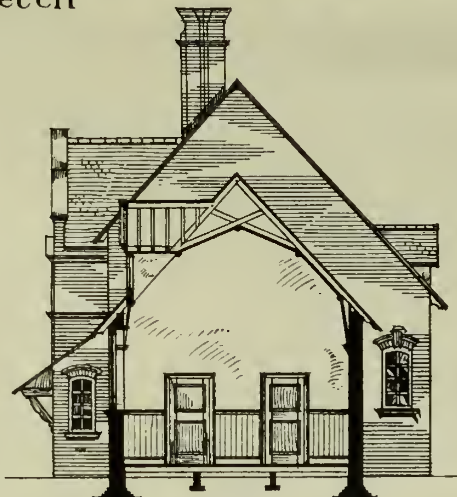


Sketch

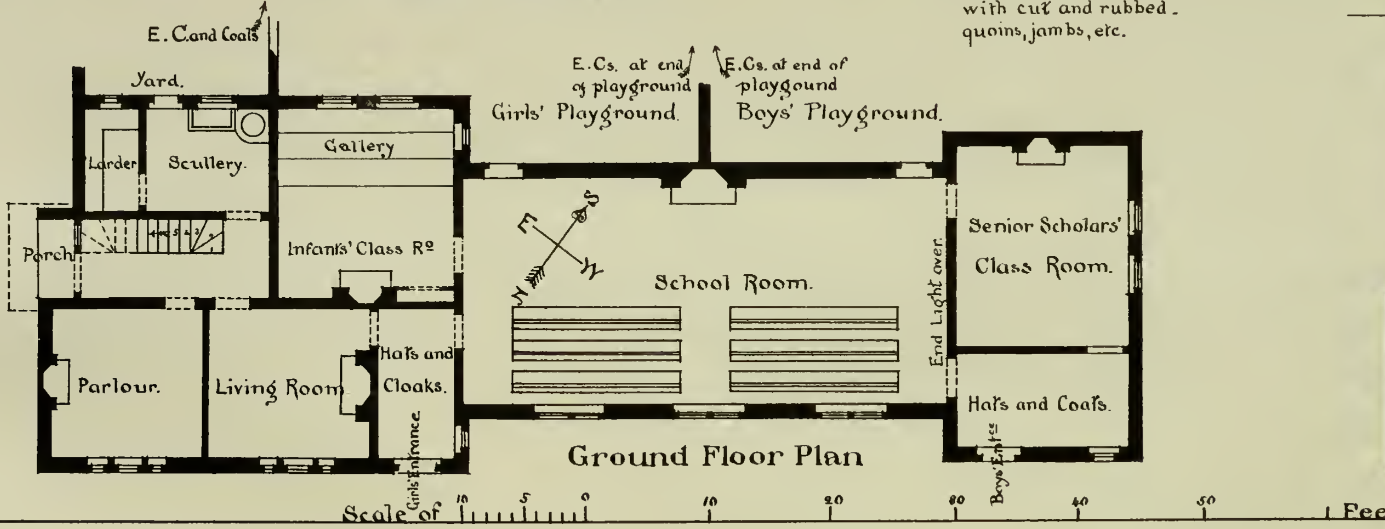


Front Elevation

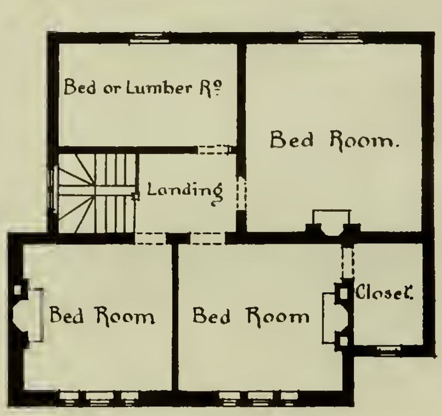
Red brick to be used, with cut and rubbed quoins, jambs, etc.



Section



Ground Floor Plan



Bedroom Plan

Photo-Lithographed & Printed by James Akerman, 6, Queen Square. W C

Building Intelligence.

Blaengwawr.—New schools for the Aberdare School Board were opened here on the 28th ult. The buildings have been carried out by Mr. J. Morgan, of Aberdare, from the designs and under the superintendence of Mr. E. H. Lingen Barker, of Hereford, the Board's architect, and without the aid of a clerk of works. The walls are built with local stone, in level bedded courses, with a cavity and internal brick lining. Forest of Dean stone has been used for dressings, and the pointed relieving arches over windows and the door arches are carried out with red and white bricks, similar materials in bands being used in the tops of all the gables, the chimney-stacks being of white fire-bricks only. The roofs, which are covered with the best Bangor slates, are of open description inside, the curved principals being supported on stone corbels, and the other timbers being stained and varnished and plastered between. Accommodation is provided for 754 children according to the new, and 797 according to the old, Government regulation; and the cost has been for the school buildings, with their offices, £3,122 11s. 9d., £62 11s. 9d. of this amount having been found necessary for additional foundation works. The cost per head has therefore been £4 2s. 10d. according to the former, or £3 18s. 4d. according to the latter calculation. The outlay on the boundary and division walls and gates was £250 11s. 9d., bringing up the expenditure, independent of the fitting-up and furnishing of the rooms, and the formation and draining of playgrounds, to £3,372 3s. 6d.

Clonakilty.—A new Roman Catholic church, dedicated to St. Mary the Immaculate, was consecrated on Sunday at Clonakilty, co. Cork. The style adopted is pure Gothic of an Early French type, and the edifice consists of nave, 158ft. long by 32ft. 6in. wide; aisles, each 72ft. by 16ft.; transepts, each 32ft. 6in. by 32ft. 6in., and with a total width from north to south of 109ft. 6in.; side chapels, 20ft. by 16ft. 3in.; and baptistery, 16ft. square. The height to ridge of nave roof is 80ft., and, from floor-line to centre rib of groining, 65ft. At the north-western angle is a tower, at present unfinished, but, ultimately, to be capped by a spire. The dressings are of Bally Knockdane granite. The lighting is by ranges of lancets, with clerestory, and a large wheel-window at the west end, and in either transept. In the apsidal sanctuary are three two-light windows, with traceried heads, and filled with stained glass, representing the Visitation, the Assumption, and the Nativity. The arcades between the nave and its aisles are carried across the transepts, so as to avoid the large piers, otherwise necessary at the angles of the transept, and giving a less disturbed view of the high altar. The columns of the arcade have capitals and sub-bases of granite, bases of limestone, and shafts of Aberdeen polished granite. The roofs of both nave and aisles have arched principals, the spaces between being filled with wood groining, having carved bosses at the intersections of ribs. The transepts have barrelled vaults of wood, the surface between ribs being boarded-in with 3in. wide yellow pine. The transepts and aisles are floored with Peak's tiles, the other floors being of wood. The high altar has been executed by Messrs. Eardley and Powell, of Dublin, at a cost of £675; it is largely composed of white marble, relieved with coloured marbles. The altar of the Sacred Heart was erected by Mr. Persse, of Dublin, at a cost of £350, and that of the Blessed Virgin by Mr. P. J. Scannell, of Cork, at a cost of £250; at the west end of church is an organ-gallery. The total cost has been £29,000. Mr. G. C. Asblin, of Dublin, was the architect; Mr. Cotta, of Cork, executed the carving in wood; and Mr. Hodgkinson, of Limerick, the painting and decoration.

Edinburgh.—The reredos in St. Mary's Cathedral, Edinburgh, has now been completed by the insertion of the principal piece of sculpture. Designed by the architect of the Cathedral, the reredos stands at the upper end of the chancel, but at some distance from the east wall. It is constructed of reddish-veined alabaster, with enrichments in variously-coloured marbles, and sculptures in white Carrara; the most important of the latter being the relievo of the Crucifixion, by Miss Grant, niece of the late Sir Francis Grant, P.R.A., which occupies the centre of the design. The structure, which is approached by steps from the level of the chancel floor, presents a central elevation, and two receding wings; the extreme width being over 20ft., and the height to the topmost pinnacle being represented by a similar figure. The lower stage consists of a plain base, about 5ft. high, surmounted by a carved cornice. Over this there rises, upon two pairs of verde antico marble shafts, a wide pointed arch, decorated with beautiful undercut carving, and carrying a crocketed gablet, with ornamental cross by way of finial. The gablet supports four angelic figures, and its tympanum is pierced by a six-leaved opening, the spandrels being filled in with delicate mosaic work. Within and behind this arch, is a second of cusped form, supported at either side by a cluster of four columns, of pinkish Jura marble. Here, too, the outline of the arch displays rich carved work, the spandrels of the cusps, like the gablet above, being filled with mosaic. Behind this, again, comes an arcade of three openings—that in the centre being cusped and somewhat wider and higher than the other two—resting on four octagonal columns of Jura marble, of a somewhat darker shade than those just mentioned, and forming, so to speak, a screen to the central relievo. The low base, on which the supporting columns stand, presents in front a row of five medallions, inclosing figures of winged angels, who severally hold the instruments of the Passion. Behind the arcade is placed Miss Grant's design, which entirely fills the three openings. In the centre arch appears the Christ in full relief—the cross, however, being only raised upon the background. On the spectator's left of the cross stands the Virgin, and behind her, in somewhat lower relief, the wife of Cleophas, closely draped, and glancing upward at the Crucified. On the other side of the cross is a Roman soldier, and beside him, in stronger relief, the Apostle John. Seated on the ground, by the foot of the cross, is the Magdalene. Through the smaller arch, to the spectator's right, is seen the good Centurion. Another soldier, towards the background, stands with folded arms surveying the scene; and these figures are balanced, in the opposite side arch, by a couple of priests. The background is occupied with a picture, in low relief, showing groups of spectators and soldiers on horseback, rocks and hills, on which is a shepherd with his flock, and the walls of Jerusalem in the distance. The statues, also modelled by Miss Grant, which have been placed in two niches occupying the flanking wings of the reredos, are—on one side St. Margaret of Scotland, and on the other, St. Columba bearing the crosier of St. Fillans.

Exeter.—On Wednesday, the new building erected for the Exeter Grammar School was opened. The schools have been constructed of brickwork, faced and adorned with Box-ground stone dressings, by Messrs. Stephens and Bastow, of Bristol, from the designs of Mr. W. Butterfield, architect, Adam-street, Adelphi, London. The style of architecture is Gothic. On the ground-floor of the main centre building is placed the large class-room, 30ft. by 20ft., and 13ft. 3in. in height. Adjoining, are four smaller class-rooms, each 22ft. by 20ft., and 13ft. high, these being similarly lighted and ventilated. The great dining-hall, a spacious and handsome apartment, 66ft. by 22ft., has an open arched roof, is 25ft. in height at the apex, and 15ft. at the wall-plate, and is lighted on both sides by tracery windows, filled with Cathedral glass. The necessary domestic offices are situated at the north end, and the food will be brought up from the kitchen by means of a lift. At the extreme N.E. corner of the building, facing the front, is situated the master's common room, and in the rear are the domestic offices, which are entered by a door on the east side, approached by a flight of steps leading from Victoria-road. Over the class-rooms are ranged on the first floor nineteen studies for boys, 12ft. by 7ft. 9in., and 8ft. 6in. high. In the turret portion of the edifice, at the N.E. end, are placed the master's bed and sitting-rooms, three bath-rooms, and a linen-room. The heating apparatus has been furnished by Messrs. Edwards and Son, of Great Marlborough-street, London. Mr. J. Newton has acted throughout as clerk of the works, and Mr. C. Hampton as foreman.

Ludlow, Salop.—The corner-stone of a new church was laid on the 8th inst., at Gravel-hill. The new building is to be dedicated to St. John the Evangelist; its style will be the Middle Pointed. The church will consist of a nave, chancel, south aisle, vestry, and porch. There will be no tower or spire, but a bell-cot on the west gable of the nave, and will contain one bell. The walls will be of native stone and Bath stone dressings. The roofs will be of pitch-pine and covered with Broseley tiles; the total cost will be about £4,500; the architect is Mr. A. W. Blomfield, of Montagu-place, Montagu-square, London; the contractors are Messrs. Wall and Hook, of Brimscombe, Gloucestershire; foreman of works, Mr. William Day.

The London School Board, at its meeting on Wednesday, accepted tenders for new schools at Bromley-by-Bow, Fulham-fields, and Clapham-road, and for the enlargement of the school on London-fields, Hackney; the amount of the tenders are given elsewhere. It was reported that it had been decided the Waterloo-road school, now in course of erection, by Mr. Marsland, of York-street, Walworth, should be enlarged by 400 school-places, on a contract schedule of prices, with an addition of 5 per cent. as compensation for the rise in the price of building materials; the quantities for the enlargement had been taken out, and showed that the cost would amount to £3,462, equivalent to £8 13s. 1d. per head. The works committee were authorised to expend the following sums on furniture and fittings for enlarged schools: Star-lane, Fulham, £273 17s. 5d., 400 school-places, equalling a cost of 13s. 8d. per head; and Beresford-street, Walworth, £423 18s., 602 school-places, equalling 14s. 10d. per head. Mr. W. Murray, formerly a furniture inspector to the board, was appointed as permanent "measuring clerk," in the stead of the late Mr. Wm. Blackmore, at a salary of £300 per annum, his duties being to furnish estimates of provisions in tenders, and to measure also, on completion of schools, all alterations, omissions, and additions. Mr. W. Clark, an assistant, was appointed for six months to act as furniture inspector, at a salary of £170 per annum.

Over Haddon.—On Monday, the new Church of St. Anne, Over Haddon, near Bakewell, was consecrated. The church, which is in the Decorated Gothic style, has been built from the designs of Mr. H. Cockbain, architect, of Middleton, near Manchester, and consists of a nave with south porch, a chancel with vestry on the north side, and baptistry, from which projects the western end of the nave, and is finished above with an open battlemented parapet. The walls are built of marble parpoints, and the chancel and porch walls are lined internally with wrought stone. The credence, sedilia, and piscina, the reredos and the font are all enriched by the use of Cornish serpentine shafts. The centre panel of the reredos has a white statuary marble cross on a rich red marble ground. The nave and porch floor are paved with Messrs. Maw's tiles; the chancel and baptistry are paved with marble mosaic, and the borders enriched with inlaid work. The general contractors are Messrs. J. R. and A. Hill, Tideswell and Litton. The benches were supplied by Mr. John Heywood, of Manchester: and the wrought-iron entrance gates by Messrs. Thomason, of Birmingham and Manchester.

Pendlebury.—The congregation now worshipping in the Congregational Chapel, Pendlebury, Manchester, are about to build a new place of worship, from drawings prepared by Mr. J. P. Pritchett, M.R.I.B.A., of Darlington. The church is designed in the "Early Decorative" style of Gothic architecture, and comprises, nave 62ft. by 25ft., aisles (each) 52ft. by 10ft., and choir, 16ft. by 14ft. There is a vestibule in the front, with staircase at each side, and vestries behind the church at each side of the choir; the nave is separated from the aisles by arcades of light iron pillars, carrying moulded arches of wood, and from the cornice above these springs a "waggon-headed" roof. The choir or chancel arch is of stone, carried by red Penrith pillars, having carved capitals and moulded bases. The present accommodation will be for 351 adults on the ground-floor, besides 20 in the choir and 52 in an end-gallery over the vestibule, or a total of 423; the building is to be erected of hammer-dressed wall stone, with dressings of chiselled ashlar; the roofs to be covered with Lancashire or dark Westmoreland slates. The contract has been taken by Mr. Wm. Brown, of Park Works, Trafford-road, Salford.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

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Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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Correspondence.

MR. BUTTERFIELD'S CHURCHES.

To the Editor of the Building News.

Sir,—Can it be possible that when Mr. Butterfield comes to Ireland he makes us the exception to his general rules? We have in the suburbs of Belfast the nave and tower of a Butterfield church; we hope he will never disown it, or call it "commonplace," as he did the photo-litho you published of Melbourne Cathedral.

We fear that such a repudiation bodes ill to the reputation of our interior, which some architects here consider is a fac simile of that by the *Australian Sketcher*. It does not interfere with the coincidence that in Ireland the triforium arcade is missing, and that the clerestory and aisle windows are comparatively dwarfed, and that the sanctuary and reredos have not yet come to hand.

We are very much puzzled by Mr. Butterfield's statements *in re* gas-pipes; for by his practice here he is quite as Irish as we are ourselves, if not more so. Here he has buried his gas-mains *below* the tiled floors of his church, and has cut holes through his columns to make a passage for his gas-pipes. Here he paints some of the stone columns in his clerestory, and makes them and other stone details, with paint, to shine in the similitude of polished marble. We have, by order of the architect, a cross of rusty nail-heads in the joinery work all over the church, which is not a commonplace feature in our churches; but we suppose it is a new development of Gothic feeling. We have in the two hundred and odd pieces of the small wooden lectern a standing marvel, not of Gothic wood construction, but of Spriggish mosaic.

It is only when we reach certain windows and their sloping jambs in Dundela church porches, that we definitely soar above "commonplace"; there is a fine feeling for "Early Irish" peculiarities in these sloping jambs, and it has been reserved to the architect of the Beresford fund to catch the frenzy of it. The "old church at Banagher" has sloping jambs, but in the language of the Celts, "Dundela bangs Banagher." Our "Zebra tower" is not commonplace in any part of Europe; 'tis another of our *restless* Irish grievances, and is unique for all time in a land famous for its towers. In passing it last Sunday evening, I overheard a fervent native pray, "May Saint Patrick save us from any more of that pattern."

We grieve to say its author has forsaken us; so that we may no more make merry over his Anglo-Irish Bulls, nor mourn over his "buried gas-pipes."—I am, &c., I. J. Phillips.

Belfast, July 27.

LIGHT AND AIR CASE.—LAYBOURN v. KIDSTON.

Sir,—Mr. Banister Fletcher, in his answer to Mr. Tomlinson this week, in the above case, in my opinion goes out of his way to reflect on the latter gentleman's judgement, on the score of youth. Now, if age is to be the measure of judgment, I cannot help thinking there is an exception to the rule in Mr. Fletcher's case, or he would not, I am sure, be so severe on one "in whose veins runs," as he designates it, "the 'hot blood' of youth."

Mr. Fletcher says he has not one word to say against Mr. Tomlinson, "except his youth"; and what has he to say against that? If, as Mr. Fletcher continues, "we cannot expect mature judgment without the unpleasant accompaniment of age," why does he go so far to disprove it by the rather indiscreet observation that follows, viz., "and those of your readers who do not know him, would, I fancy, certainly (*sic*) from his passionate attack on a gentleman who stands in the front rank of our profession, . . ." I cannot help submitting, Sir, that Mr. Tomlinson's letter is written in quite as manly, and in as dispassionate, a manner as Mr. Fletcher's.

Mr. Tomlinson, we are told, is young (I trust youth is no discredit to an architect, for I am young myself and do not regret it, although possibly I may lack the necessary accompaniment of "mature judgment"), but from the correspondence I should have imagined him to be quite as old as Mr. Fletcher, for his letter is written in equally as terse and lucid a manner as that of his antagonist; and I should say, with all deference to Mr. Banister's opinion, that he has acquitted himself creditably of the important charge committed to him by his client, and has proved himself as capable as most men of protecting his client's interests.

I beg Mr. Fletcher will not hold up either of the honourable gentlemen whose names he has mentioned as being infallible, for I have recently proved them both to be as fallible as other men in one and the same case. Mr. I'Anson and Mr. Hesketh were both retained by the defendant in a notable case in the city, whilst I, amongst others, gave evidence on behalf of the plaintiff. In this case the evidence for the plaintiff was so overwhelming that neither of the said honourable gentlemen was called, nor, indeed, any of the other witnesses on that side, the Master of the Rolls being satisfied there was no defence. I mention this to prove that mature judgment is not always the "unpleasant accompaniment of age"; in fact, is it not notable that the more desperate the case the greater the necessity of retaining the most eminent counsel? But, fortunately, they do not always win.

Mr. Fletcher ought not, therefore, to go out of his way to trample on youth, for—

> "Youth is not rich in time, it may be poor;
> Part with it as with money, sparing; pay
> No moment, but in purchase of its worth;
> And what its worth, ask death-beds; they can tell.
> Part with it as with life, reluctant!"

The same spirit as that expressed in Edward Young's lines actuates every faithful young man in defending the reputation his precious youth has gained for him. I willingly join in so noble a fight.

I feel sure Mr. Fletcher would not consciously or intentionally wrong any young man who is striving honourably and diligently to attain, at least, the same amount of distinction in his profession as Mr. Banister Fletcher has attained for himself in his time of life.—I am, &c.,

July 23. H. H. Bridgman.

THE ST. PAUL'S ECCLESIOLOGICAL SOCIETY AT CANTERBURY.

Sir,—I do not know who is responsible for the account of the visit to our Cathedral, which has been forwarded to you; but whoever is the author, it reflects very little credit upon him; and I would strongly advise the St. Paul's Ecclesiological Society, the next time they visit our city, to secure the services of some really trustworthy guide to the building, for there can be no doubt that the person who officiated in that capacity is answerable for some, if not most, of the blunders that have been transmitted to your pages. I have indicated them in the following:—

1. Dr. Thomas is not an *Honorary* Canon, but I am happy to say a regular member—and a most affectionately regarded, and profoundly respected one—of our Cathedral Chapter.

2. The "scraped appearance" evident "throughout" the building, exists chiefly in the imagination of your correspondent. The nave certainly has been restored and cleaned; and sadly it needed it.

3. The central tower appears the oldest portion, not through any special decay of its masonry, but because the greater part of the remainder of the *exterior* of the building has been restored.

4. The two Williams, or rather the first of the name, did not incorporate any palpable portion of *Lanfranc's* choir—which latter, indeed, was pulled down almost entirely. Your correspondent means the choir of Ernulph.

5. The *Saxon* nave terminated in an apse at the west end, but of its exact extent we know little. Neither was it burnt down "between 1170 and 1220." It is Lanfranc's nave which occupied the same area—having *no* western apse—as the present one, but that part of the building was not destroyed by fire, but replaced by Perpendicular work in the regular way.

6. What authority is there for referring the upper part of the "Crown" to a period so early as the 15th century? or for doubting that St. Andrew's and St. Anselm's chapels were once towers; these latter are—if I rightly recollect—so represented in the Norman drawing.

7. The "picturesque flight of stone steps" leads to the east transept, and not to the treasury—except by a very roundabout way.

8. The "dark passage" mentioned does not run anywhere near the choir steps.

9. The garth of the cloisters is not a "small" one—according to the usual cloistral areas.

10. The Early English work in the latter seems to have been ignored by your correspondent.

11. The pavement of the "Martyrdom" has much of it been removed since the time of the Murder.

12. The staircase in this arm is distinctly Lanfranc's unaltered work, and ought to have been pointed out.

13. The bigness of the Perpendicular piers of the Great Tower is simply owing to the fact of their retaining Lanfranc's cores. A piece of the plinth is visible on the south side.

14. For "dog-tooth" substitute "Astorite"; and "chevron" and zigzag may be considered

identical (*Willis* is partly answerable for the first error).

15. The "patriarchal chair" is not "rude" in its workmanship, but very accurately cut.

16. The loft over St. Anselm's Chapel is not now regarded as a watching chamber. It seems much too far off for such a purpose.

17. The "false perspective" spoken of is an accident, caused by the opening-out as much as possible of the east transept. The graduation of the bays was done by William of Sens to save the fortifying of more of the crypt piers than was necessary. If the architect had intended to produce the effect stated (which, by the bye, is obviously *reversed* when the choir is viewed from the east) he would not have widened his eastern bays again, causing one of them to stride bodily over the crypt pier.

18. The "Alexandrine" mosaic does not mark the site of the shrine of Becket. The latter stood more east, and its position is defined by a chauncling in the pavement, which ought to have been explained to the visitors.

19. The exhumation of the body of "Becket" is, indeed, a miracle in comparison with which all that is asserted to have been done by that archbishop during his lifetime sinks into utter insignificance. The *face* of *King Henry IV.* was laid bare to the light during the year 1832. The present Mr. Austin was then a boy—or little more—and, if a witness of the "exhumation" at all, was so only by favour or by connivance. The "38 years ago" is (as will be seen) purely mythical, according to the foregoing date, which is that given by Summerly.

20. The Lady-chapel in the crypt is not "Perpendicular" in the date of its *foundation;* neither had Lady Mohun anything to do with such founding. She merely wished her remains to have the companionship of the pillars of this central chantry.

21. The remark about "acid," &c., looks to me somewhat like a piece of spite from somebody. The Chapel of St. John has been carefully opened, and the frescoes restored in a most masterly manner by Mr. Neale, tracings having been taken at the same time. The chapel is accessible to the public—under proper restrictions.

22. The assertion about the "well" is very open to question. The orifice seems to be that of a niche or water-drain for the usual purpose, only that it is nearer the ground than is common. The monastery of Christ Church was abundantly supplied by water from a spring situated about a mile away (see the Greater Norman Drawing), and a "well" in the Crypt Transept would have been as useless as out of place. As for stones being dropped in, the Vergers are far too careful to allow anything of that sort to be done,—as a practice.

There are other statements which are erroneous, such as that which ascribes to Grinling Gibbons, the "carving" of the "deal" pews or pens, just got rid of (both carving and material being purely imaginary as regards this precise portion): and there are others which are doubtful, such as the remarks about "wiriness" of reredos, and lack of vigour, in Austin's Tower-window mouldings. But the foregoing will be sufficient to demonstrate the general untrustworthiness of the account sent to you.—Yours, &c. JOHN W. WARMAN, A.C.O.

UNDERWRITING DWELLING-HOUSES.

SIR,—It is doubtless true, as "Civil Engineer" hints, that a modern dwelling-house is a more complex structure than an iron vessel; that the forms of the material supplied to the shipbuilder admit of easy testing; but the facility with which the parts of a vessel can be inspected is not entirely owing to the similarity between all vessels, but is mainly due to the system of classification and inspection which is adopted. I consider that if the processes of laying concrete foundations, building footings to walls, inserting air-bricks, inspecting thicknesses of walls and timbers, examining lime and sand, were duly performed in a regular manner, under inspection, they would soon be considered quite as mechanical as the punching and drilling of rivet-holes. Inspection would beget method, and duties of inspectors would become diminished. Every stage of a building's progress would be submitted to the supervisor, who might pay two or three visits a day if necessary, and materials should be tested before being brought upon the premises. The remark that all engaged in the business of building vessels have an interest in producing good work, applies quite as forcibly to house construction when once it becomes open to inspection, and is carried out under a system of certificates. A "Civil Engineer" refers to the helplessness of the Metropolitan Board, permitting improper materials to be employed; but under the *régime* of Mr. Cresswell, there is no reason why that body should not become the Lloyd of building in the Metropolis at least. The "Civil Engineer's" onslaught on the modern fashionable building specification is justified; it is, after all, too much a matter of form, and the practical builder treats it as such; but this is a strong additional argument in favour of a classification and inspection of dwellings. In these times of fashionable architects, when the Queen Anne or Dutch William craze overwhelms one or two architects with so much work that they cannot spare time to attend to the construction, or supply details for their own buildings, can we wonder? And these are men who often prate the most about the old mediæval architect who devoted his whole mind and energy to one building at a time. Results speak for themselves.—I am, &c. ARCHITECTUS.

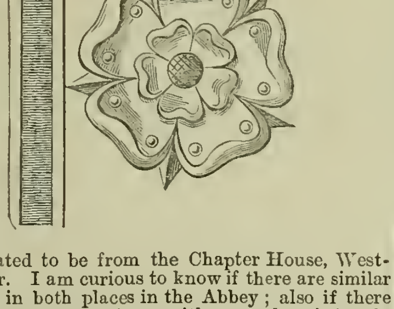
OUR ANCIENT MONUMENTS.

SIR,—'Tis to be hoped that in the second edition of this work, when the author finds time to subside into a nearer approach to accuracy in his references, he will not omit to correct his "lapsus" *in re* the Abbey of Downpatrick. You might well have placed a note of interrogation (?) after his misleading and confused information respecting "the pillars in Downpatrick Abbey, similar to that after Rudston and Ruthwell (?) pillars."—I am, &c. ULIDIA.

PANELS AT WESTMINSTER.

SIR,—Some years ago, when I was sketching the bronze doors to Henry the Seventh's Chapel in Westminster Abbey, I copied in my book a panel which is identical with that so cleverly rendered by Mr. Pennington in your photo-litho of 23rd inst., and stated to be from the Chapter House, Westminster. I am curious to know if there are similar panels in both places in the Abbey; also if there is a solid plate backing to either panel, or is it only in the cast? There are certain peculiarities in the foliation of the Tudor roses in my sketch which do not appear to be in the cast in the museum.—I am, &c.,

Belfast, July 26. I. J. PHILLIPS.



* * *

A new Church of St. James was opened at Tebay, near Orton, on Tuesday week. The building consists of chancel, transeptal organ-chamber, and nave, the western end being semi-circular, with a round towerlet, finished by a conical roof. Under this west end is a crypt-vestry and a heating-chamber. The walling material was given by Mr. Fenning, of the Shap granite works, and is lined with red and white brickwork. The chancel fittings, which were executed by Mr. Huck, of Endmoor, are of walnut, and the seating in the nave is of pitch-pine. The flooring throughout is of wood-blocks. The font is a solid block of local granite, circular in form, and partly polished, with an inscription in large lettering carved upon it. Mr. Ferguson, of Carlisle, was the architect, and Mr. Donaldson, of Barnard Castle, the contractor. The cost of erection was £1,600.

The east window of the parish-church of Welwick, East Riding, has been filled with stained glass by Messrs. Heaton, Butler, and Bayne, of London. The subjects of the five lights are the Nativity, Baptism, Crucifixion, and Ascension of Our Lord, and the Descent of the Holy Ghost upon the Apostles on the Day of Pentecost.

Intercommunication.

◆◆◆

QUESTIONS.

[6178.]—**Heating Board Schools With Hot Air.**—Could any of your readers inform me if there are any Board Schools for infants, boys, and girls, with two separate class-rooms to each department, all on the ground-floor, that are all heated by means of hot air?—MARCHIO.

[6179.]—**Builders' Clerks' Holiday.**—Will some one kindly inform me what is the custom as regards holidays? Are they allowed, and upon what terms is it general to stop their salaries? Can they claim any time?—ONE WHO NEEDS IT.

[6180.]—**Brittany.**—The writer would be glad to know if there is a guide published treating pretty fully of Brittany generally, but more especially of its architectural features; or if any of your travelled readers would give him some information on this subject he would feel obliged.—M. H. C.

[6181.]—**Repairs.**—A lady takes a house for a year, the only article in the agreement between her and landlord as to repairs is that the premises are to be delivered up "in as good repairs and conditions as they are in at the time of taking possession." Having been in the house three months, a portion of the ceiling falls down. Is not the landlord bound to repair? It appears so, I think, by Table XII., in "Dilapidations," by Banister Fletcher. If he refuses, what steps can be taken to compel him to do so, the tenant losing money through not being able to let the room?—SURVEYOR.

[6182.]—**Numerical Value of Log.**—Will some kind mathematical reader tell me how to find the numerical value of $10^{1.079181}$?—LOG.

[6183.]—**Depth of Black Clay on Poole Head Beach.**—I am told that next below the black clay comes chalk, with excellent water supply, 2½ miles west of Bournemouth Pier. The black clay crops up a few feet higher than the high-water line. Can any of your readers kindly say (*a*) the thickness of the black clay bed, (*b*) cost of boring the same, (*c*) probable height to which the water would rise from the chalk (adjacent sand-cliff is 87ft.), (*d*) best sort of light pier to run out? The clay seems to extend some distance into the sea, and the fall is gradual.—POOLE HEAD, POOLE.

REPLIES.

[6152.]—**Compensation.**—B., as sole contractor to A., is responsible, not D., who is only a sub-contractor. The question of compensation is, of course, between C. and D., and then if there is no agreement as to time, A. cannot sue for damages.—G. H. G.

[6153.]—**Sea-Sand.**—"C. F. M." had better batten his wall if he wants to insure perfect dryness. Thin sheets of lead or tinfoil is the only way I know of for effectually hiding the damp places, and this requires to be done with great care. The "Indestructible" or Petrifying liquid is also a good solution for applying to damp walls.—G. H. G.

[6167.]—**Pitch for Tiled Roof.**—The required lap in roof-tiling varies from 2½in. to 3½in., according to the pitch of roof. Beckett's (Hartford, Cheshire) verge tiles secure uniformity of lap, besides supplying a substantial and ornamental finish.—C. H. M.

[6167.]—**Pitch for Tiled Roof.**—In my reply on p. 113 there are two errors. "1¼in." should be "1½in. lap," and "treated" should be "torched," which is a term generally used for pointing tiles.—BRICKLAYER.

[6171.]—**Perspective.**—An examination in 3rd grade perspective is held annually in May at any of the schools of art. All candidates presenting themselves must have obtained a full certificate for the four second grade subjects. The course embraces the representation of any object in any position, its reflection and its shadows by the sun or any artificial light. "3rd Grade Perspective," by H. J. Dennis, is the best text-book published. It is awarded by Government as a 2nd grade prize. "Queen's prizes" are awarded for excellence, certificates for "good," and if a student passes only, he may try an unlimited number of times for "good" or "excellent," but if he obtains "good" he cannot sit again for "excellent."—3RD GRADE EXCELLENT.

[6171.]—**Perspective.**—The Advanced Local Examination in Advanced Perspective, open to students of schools of art and art night-classes taught by 3rd grade masters; it requires "a thorough knowledge of the perspective of oblique planes, of shadows and reflections, as well as of the perspective of solids or objects applied to difficult cases."—3RD GRADE ART MASTER.

[6171.]—**Perspective.**—There is a 3rd grade examination held at South Kensington Schools. It differs from the 2nd grade in as far as it treats of objects in any possible position, whereas 2nd grade only treats of objects which may be found by lines vanishing in the horizontal line, or parallel, or at right angles to the picture line. It is often termed oblique perspective, because many of the results are obtained by means of oblique planes. It also treats of shadows and reflections in water, &c. In fact, 2nd grade perspective is only an introduction to oblique or 3rd grade perspective. "Colcestriensis" will do well to put himself under a competent art teacher, for although there are several good works on the subject he will find it better ultimately to do as I recommend. Of course, this subject is classed amongst "Local Advanced Art Examinations," in common with architecture, anatomy, design, &c. Consequently, to be examined in this subject he will require a full 2nd grade certificate.—CERTIFICATED.

[6175.]—**Rot in New House.**—Your correspondent, on the subject of "Rot in New House," incidentally mentions that "pitch pine" was used for sleepers. My experience in the use of this description of timber leads me to suspect it as the origin of the mischief. In situations at all damp, especially in stagnant air, it will become entirely rotten in an incredibly short time, and dangerously affect all other woodwork in connection with it.—HENRY LAWRENCE.

STAINED GLASS.

BRADFORD, YORKS.—Four additional stained-glass windows have been placed in the church of St. John, Horton-lane, in this town. They stand side by side within the great west arch of the church and immediately beneath, and, as it were, crowned by the large rose window of that arch. Each is a single light, and each is occupied by a figure of one of the Four Evangelists. The outlines of the figures are bold, and the colouring of their robes very rich; the more effective from contrast with pure white diaper backgrounds, each in its turn enframed by a broad foliated border on a rich ruby ground. These windows are from the studio of Messrs. Powell, Bros., 30, Park-square, Leeds, by whom also are other stained-glass windows in the same church.

CHISLEHURST, KENT.—A two-light memorial window to the memory of a lady deceased, has just been erected in the Wesleyan Chapel of Chislehurst. In the centre of each light is an enriched boss which displays a lily entwined by a riband bearing a Scriptural legend, the one being, "The Lord is My Shepherd," the other, "My Sheep Hear My Voice." By instruction no figure subject is introduced, but instead the lights display a variety of foliated ornament richly treated. The design and execution are by the art firm of Messrs. Powell, Bros., Park-square, Leeds.

WATER SUPPLY AND SANITARY MATTERS.

CANNOCK.—The inauguration of the new pumping station and other works recently constructed by the South Staffordshire Waterworks Company, under their Extension Act of 1875, was celebrated on Wednesday by an excursion to the works, which are situated at Huntington and Hednesford, in Cannock district. The new source of supply, which was accidentally revealed during trial sinkings for coal in 1874, is the conglomerated pebble-bed formation, a subdivision of the new red sandstone, and the quality of the water has been favourably reported upon by Dr. Hill, of Birmingham, and Professor Voelcker, and the quantity obtained is very large and capable of great extension. From the stations at Huntington and Hednesford, which are about 3½ miles apart, the water is pumped into the Scout-house reservoir at Cannock, whence it is forced along the mains of the district where the local service reservoirs and engines maintain a constant and equable pressure at the many varying levels. The pumping engines, four in number, are of 165 nominal horse-power each, and capable of raising five million gallons daily at each pumping station, thus increasing the company's supply from 10 to 20 million gallons daily, a supply that may be indefinitely increased, if required, in the Cannock district, by increasing the pumping power. From the main reservoir at Cannock, the water is carried by gravitation through a trunk main to Wednesbury, where it is connected with the rest of the company's system, and merged in the general supply derived from the sandstone rocks in the vicinity of Lichfield. For reaching some of the high-lying districts about Dudley, the water is repumped at Wednesbury to a higher reservoir on a system which utilises the pressure from the Cannock reservoir, and the rest of the Black Country is reached by simple gravitation. The pumps are all in duplicate. The works have been designed by, and carried out under the superintendence of, Mr. W. Vawdsey, the engineer to the company. They have been divided into three contracts, of which, that for the erection of the engine-houses, pumping-stations, and other buildings, which are all in the Norman style, was let to Messrs. Trow, of Wednesbury; that for the engines to Messrs. James Watt and Co., of Soho; and that for the reservoirs at Scout-house, and laying pipes and mains, to Mr. Joseph Walker, of Crewe. The expenditure has been about £313,000.

DORCHESTER.—At the meeting of the town council of Dorchester, held last week, the drainage of the town formed the subject of a long discussion, initiated by the Mayor, who reported an interview with Mr. Flozer, M.P., in which that gentleman, as the owner of adjoining land, had positively refused to allow any further flow of sewage into the river. A letter was also received from the Local Government Board, inclosing copy of a memorial received from residents on the Cornwall estate, complaining of the absence of drainage on the estate. After a warm controversy, the mayor and borough surveyor were deputed to visit Aylesbury, Coventry, and Taunton, and report back to the council on the respective merits of the modes there used for sewage disposal.

RIVER POLLUTION.—A deputation from the Fisheries Preservation Association and other kindred societies had an interview on Tuesday with Mr. Dodson, and represented to him that the Rivers Pollution Act was practically inoperative. Mr. Dodson said a deputation of manufacturers had recently represented to him how difficult it was to work under the Act; the statements of both deputations would be carefully considered.

UTILISATION OF SEWAGE.—At Aylesbury, on Monday, what is termed a "demonstration" of the practical utilisation of sewage was made at the Aylesbury Sewage Works, where the wastes of the town population are intercepted and formed into a commercially valuable agricultural product. A large company was present, including many local authorities of British and foreign cities. The work of utilising the sewage of Aylesbury has been undertaken by the Native Guano Company, whose chairman is the Hon. W. F. B. Mainwaring, and the work which most concerns the town as a town—that of purifying the water courses which flow from it—is undertaken at a fixed sum of £200 a year. The chairman of the company, assisted by Mr. Sillars, Mr. Rawson, Mr. Page, and the officers, explained the process adopted, which is that known as the "A B C," and is simply a process of precipitation or "settling." As the sewage pours into the works at the rate of 300,000 gallons a day—the refuse of a population of 8,000 or 9,300—it receives an admixture of the clay and charcoal in solution. This acts as a deodoriser. The stream, which has become black by this admixture, flows on towards large tanks, and as it passes it receives another liquid, this being the precipitate, formed of sulphate of alumina, which is shale treated with sulphuric acid. In the process of precipitation the sewage thus added to passes over three tanks, and then runs out apparently as clear as water from the spring. It is said that fish live in this water, and Professor Wanklyn certifies that in some respects it is purer than water used for domestic purposes in many parts of the kingdom. The precipitating process leaves behind each week upwards of 10 tons of solids known as "sludge." This is converted into a pulverised innoxious manure which fetches, it is stated, about £3 10s. a ton in England and a yet higher price abroad. After the inspection, Mr. C. S. Read, speaking as an agriculturist, while he was of opinion that the irrigation system was applicable to certain friable lands, said he considered that this system solved the great difficulty of sewage disposal for the large towns which could not obtain the vast acreage necessary for irrigation.

LEGAL INTELLIGENCE.

BY-LAWS OF THE METROPOLITAN BOARD OF WORKS.—Mr. T. J. Neale, of 33, Aylesbury-street, Walworth, builder, was summoned on the 22nd inst., before Mr. Ellison, at the Lambeth police-court, for an infringement of the new by-laws, issued by the Metropolitan Board of Works, under the Metropolis Management and Building Acts Amendment Act, 1878, in using bad mortar in the erection of a new building in the rear of No. 80, Old Kent-road. Mr. George Lansdown, district surveyor of East Newington and part of St. George the Martyr, Southwark, appeared in support of the summons, and explained that the builder had received notice to amend under the Building Act, as well as under the by-laws, but had neglected to amend and had left the work. The defendant pleaded guilty. The magistrate fined him 5s. and 2s. per day for each day since notice to amend, and 2s. costs, total 27s. The penalty in case of the breach of any of the provisions in the by-laws is a penalty not exceeding £3, and in each case of a continuing offence, a further penalty not exceeding 30s. for each day after notice thereof from the board or district surveyor. Since the hearing, the building has been entirely taken down.

DEVIATIONS FROM DEPOSITED PLANS.—At Cockermouth Petty Sessions, on the 21st inst., Thomas Wellwood was summoned by the Cockermouth Rural Sanitary Authority for having committed a breach of the by-laws of the Authority in building cottages at Distington. Mr. Thomas Weatherstone, surveyor to the Authority, stated that the Distington Iron Company had presented plans to the Authority for 23 new cottages. The plans were perfectly right, and were passed by the Authority. On proceeding to the place some time afterwards he found the cottages occupied, and that they had not been built according to the plans deposited, the privies being within 10ft. of the dwellings. The case had been adjourned to give defendant time to make the alterations, but up to that morning nothing had been done, and he asked, therefore, that a penalty should be imposed. Defendant, who did not appear, was fined £5.

UNSANITARY DWELLINGS.—Joseph Henry Burton, of 48, East-street, was summoned at Marylebone, on Tuesday, by Mr. Lightfoot, inspector of nuisances for the parish of Marylebone, for allowing the premises Nos. 3, 4, 5, and 6, York-court, East-street, Marylebone, to be in such a state as to be a nuisance and injurious to health.—Mr. W. E. Greenwell, vestry clerk, said that York-court had been for years known as a disgraceful place. Some of the houses had already been removed under the Artisans' Dwellings Act, and those remaining were condemned by the Medical Officer of Health as unfit for human habitation. Mr. Burton, the defendant, had lately become the lessee of the premises, the former lessee having gone away to America, leaving the tenants in possession of the rooms, who now refused to pay any rent to Mr. Burton, alleging that he was not the landlord. Mr. Burton could not get the tenants out, but that was nothing to the parish, who complained that the houses were a nuisance, and required extensive repair. That work could not be carried out until the tenants were got out. He had to ask for an order under the Nuisances Removals Act, after proving the nuisance, which would subject the lodgers and occupiers to a £5 penalty for refusing to leave the dwellings. Mr. Burton was willing to do the necessary repairs if the houses could be emptied.—Mr. Lightfoot was called, and proved the above facts, stating that the premises were filthy and dilapidated. The paving of the yard was broken, the roofs, walls, and ceilings out of order, and the cisterns were dirty.—Mr. Burton said he would do the necessary repairs if by a magistrate's order he could get possession.—The order asked for was granted.

CHIPS.

A new church at Kingston, Dorset, was consecrated on Saturday. It is 13th-century Gothic in style, and has been built at the cost of Lord Eldon at an outlay of between £30,000 and £40,000. Mr. G. E. Street, R.A., is the architect, and the work has been in course of construction during the past five or six years. The church is cruciform in type, with a lofty central tower containing a peal of eight bells. The walls are all built, both within and without, of wrought stone, and the eastern part is groined in stone. Features of the interior are the elaborate mouldings employed, and the free use of columns and shafts of polished Purbeck marble. Nearly all the windows are filled with stained glass by Messrs. Clayton and Bell, of London; the organ was supplied by Messrs. Mahey and Oldknow, of London. Near the church a large vicarage house is approaching completion from the same architect's designs.

The Metropolitan Board of Works, on Friday, approved the plans and specifications, submitted by Messrs. Buck, Son, and Smith, by direction of the justices of the county of Kent, for the rebuilding of Deptford bridge, and the widening of the road and waterway. It was also resolved to contribute one-half of the cost, estimated at a total of £8,000, to the Commissioners of Sewers, for making a new thoroughfare from Chancery-lane to Fetter-lane. A report was received from the bridges committee submitting that, in the judgment of the board's engineer, the following works of repair and maintenance were urgently necessary:—(*a*) works for deepening the foundations of Waterloo-bridge, estimated to cost £40,000, notice to be sent to the Thames Conservators that the board are about to execute the proposed works forthwith; (*b*) that application be made to Parliament, next Session, for powers to enable the board to deepen the channel and enlarge the span of Vauxhall-bridge, at an estimated cost of £45,000; that similar Parliamentary powers be applied for to rebuild (*c*) Battersea-bridge, (*e*) Putney-bridge, and (*b*) Deptford Creek-bridge, at estimated costs of £250,000, £300,000, and £20,000 respectively; and (*d*) that works of painting and repair be done to Wandsworth-bridge forthwith, at an estimated cost of £5,000. After a short discussion all the recommendations were agreed to.

The Shildon and East Thickley local board have recently discussed the character of the materials used in the extensive drainage works recently carried out in their district, supplied by Messrs Davison and Toward, brickmakers, and members of the board. Eventually the board referred the matter to Mr. William Cudworth, of Darlington, engineer to the North-Eastern Railway Company. Mr. Cudworth has now made his report, in which he speaks favourably of the bricks and tiles in question.

A new theatre was opened at the Spa, Scarborough, on Wednesday week. Messrs. Verity and Hunt are the architects. Mr. F. Arthur, of Motcombe-street, London, carried out the decorations, and Mr. Littlejohns, of London, the stage fittings. The new Spa-buildings and Cliff-bridge will be opened by the Lord Mayor of London on Monday next.

The rural sanitary authority of Skipton last week adopted schemes of water supply and sewerage prepared by Mr. Filliter, engineer, of Leeds; the estimated cost is £2,700 for water, and £4,500 for sewering.

The organ of St. Paul's Church, Truro, was reopened on Friday, having been enlarged and improved by Messrs. Hele and Co., of Plymouth.

Our Office Table.

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AN industrial exhibition is to be held at the Alexandra Palace during the month of September. Medals and other prizes to the value of £200 will be offered for competition in the several classes of mechanical industry, artistic productions, and fabrics and fancy work; drawings, &c., executed by persons under 18 years of age; and also work done by school-children. Instructive or interesting articles, not intended for competition, will be received for exhibition. Persons eligible to compete for prizes must belong to the working classes, in the usual acceptation of the term, or as defined by the judges. The "exhibits" for which prizes will be awarded embrace, in the mechanical section, cabinet work, inlaid tables, ivory and wood carving, turning and fretwork, and musical instruments; models of steam-engines, buildings, carriages, ships, &c.; models of appliances for saving life, machines worked by electricity, clocks and watches, &c. In the artistic section will be included work in terra-cotta, stone, marble, alabaster, and china, tiles, mosaics, ornamental writing and illumination, oil paintings, water-colour and pen-and-ink drawings, architectural and mechanical designs, graining and marbling, decorative painting on glass, china, &c., and miscellaneous artistic work on precious metals. The general and fancy work section will include the usual display of objects of natural history, scrap-screens, patchwork quilts, embroidery, and other useful and ornamental articles.

THE Historical-Antiquarian Society of Grisons have lately added to the treasures of their museum one of the few Gothic altar shrines that still remain in Eastern Switzerland. It was formerly in a chapel belonging to the Mesolcina family, and has been purchased by the society from the present proprietor of the chateau, of which the chapel forms a part. The shrine is divided into three parts. On the plinth is a painting in oil of the hankerchief of St. Veronioa held by two angels, and on the triptych and side shrines are portraits, also in oil, of St. Stephen and St. Anthony. The inside of the shrine is gilt, and the gilding is in excellent preservation. The interior contains figures, carved in wood, of St. Nicholas, St. Maria, and St. Catherine, their names being indicated in the later Gothic characters. Two other figures are carved on the reverse part of the side shrines; but the names of the saints whom they are intended to represent are not given. On the crown of the shrine are carved seven busts, supposed to be those of the founders or patrons of the chapel. The barets of two of the number mark them out as priors of St. Victor; two others wear clerical costumes, the remaining four being habited as civilians. With the exception of some slight damages to a few of the figures, which can easily be made good, the shrine is exceedingly well preserved. The carvings and paintings are well executed, and belong to the same style of art, and probably to the same age, as the decorations of the cathedral altar of Coire and the altar of the Church of St. Lucius at Churwalden.

IT is proposed to have an International Exhibition in Rome in 1885-86, and a journal has been started to further the project. An effort is being made to secure for the Exhibition outside Porta Pia and Porta Salara, on the north side of Rome, embracing the Villa Albani, with its fine collection of sculpture and Italian garden; the Villa Borghese, with its pleasant walks and gallery; the Villa Ludovisi, adjoining the walls, with its casino, and the Aurora of Domenichino; the Villa Patrizi; the Villa Torlonia; the Villa Ada—lately the king's property, but since bought by Count Telfener—which reaches to the edge of the Anio; and the tract lying between these estates, from the furthest of which the land drops suddenly down to the Campagna, giving a splendid view of the Soracte and the Sabine Hills.

MR. T. W. DANBY, H.M. Inspector of Schools for the Ipswich district, in his report for 1879 on the schools in the Ipswich, Samford, Woodbridge, Plomesgate, Blything, Wangford, and Mutford census divisions, says:—"Although the school buildings are generally satisfactory in respect of cubical content, site, &c., it is quite obvious, in many cases, that architects, builders, and those who have employed them in erecting schools, have not paid adequate attention to the details of internal arrangement and organisation, such as desks, lighting, warming, and the like. In visiting new schools, I frequently find that architects, in providing for the admission of light, have thought more of external architectural finish than of the eyes of scholars and teachers, who have to spend daily many hours in the schoolroom. Again, in selecting desks, managers seem more highly to appreciate ready convertibility into seats, or even tables, for meetings in the room, than convenience during ordinary school-work. In far too many cases, ventilation is ignored by architect, builder, manager, and teacher alike."

THE City Commissioners of Sewers received, last week, a report from the Improvement Committee, stating that they had received tenders for the land cleared in the "unhealthy areas of Golden-lane and Petticoat-square, for the purposes of the erection of artisans' and labourers' dwellings. The sites had been acquired at a cost of over £240,000; but if the highest sum offered were accepted, the loss would considerably exceed £200,000. In accordance with the committee's recommendation, the consideration of the tenders was adjourned, and it was decided to communicate with the Home Secretary as to whether he is willing to allow the loss to be mitigated, by permitting the basements and ground-floor to be utilised for shops or stores, on condition that equally convenient accommodation be provided in the upper stories for the number of artisans and labourers ejected from the demolished tenements. It was stated that by this modification the loss would probably be reduced by £25,000.

IT often occurs to the *Medical Press and Circular*, "What must foreigners think of the rotten cattle-sheds called London Bridge Station? To them it is the entrance-portal to the metropolis, and as they look around at its felt-covered roof, its unpainted timber, and its whitewashed walls and ceilings, now turned black with age and dirt, well may they exclaim on reaching this gateway to the richest metropolis of the world, What a filthy place! And if, unfortunately, their affairs compel them to get out at the station, a second look would certainly confirm first impressions. They would find subterranean passages through which passengers pass almost as black as night, so that gas has to be burned the whole day long, waiting-rooms with huge holes in the ceilings and walls, where plaster will hang together no longer, and the South Eastern Railway is so bent upon paying big dividends that it has no time or inclination to study the comfort or health of its patrons. Should the weather be stormy or the sun exceedingly hot, the narrow ledges which for years have done duty for a station, will be found insufficient to save them either from a drenching or sunstroke. Verily the whole concern reflects the highest discredit upon Sir Edward Watkin and the management in general."

ON Friday last, at Nidd Church, near Harrogate, was started a new large public clock, which has been fixed in the church by Messrs. Wm. Potts and Sons, Guildford-street, Leeds. The clock is constructed on a solid horizontal cast-iron bed frame, which is planed. It has also maintaining power on the bolt and shutter principle, by Sir E. Beckett, Q.C., to keep the clock going during the time of winding up. The escapement is the double three-legged gravity, by Sir E. Beckett, Bart, with phosphor-bronze pallets and check action to prevent tripping, this being the most accurate kind of escapement made. The clock strikes the hours and half-hours on the large or tenor-bell of the peal. Messrs. Potts and Sons have also just completed a large illuminated clock, with four dials, 9ft. 6in. each in diam., for the New Town Hall, Wakefield, which strikes upon a bell of 2½ tons. Also the large clock at Westgate Joint Station, Wakefield, which shows the time on the four illuminated dials, 7ft. 6in. each in diameter, and was set going on Friday last. The same firm are also engaged making a large clock for Lincoln Cathedral to strike the Cambridge quarters on four bells, two of them being new ones, and the hours on the famous "Big Tom of Lincoln." They are making another large clock for the Central Station, Manchester (Cheshire lines); and a large illuminated clock, with four 6ft. dials, for the Melbourne-street Wesleyan Chapel, York; and Cambridge quarter-clock, with four 6ft. illuminated dials, and five new large bells, weighing over two tons, for Dewsbury; and have lately erected the Hunslet Moor clock, with four dials; the Huddersfield Corporation quarter-clock, with four outside dials, and three new large bells; two new large clocks and bells near Ripon; one near Hull, and another near Grantham; also the New Station clock, Sunderland, with four 7ft. illuminated dials.

IT has been resolved by the Philosophical Society of Glasgow to hold an Exhibition of Apparatus in the Burnbank Drill-hall, Glasgow, from Sept. 28 to Oct. 25, illustrative of the most recent developments in the use of Gas, Electricity, &c., for lighting and other purposes. The scheme has been actively countenanced and encouraged by the gas and water committees of the town council. The range of subjects to be illustrated by the exhibition will include apparatus, appliances, models, or drawings that relate to, or illustrate, any of the following, namely:—Coal-gas—its manufacture, purification, storage, distribution, regulation of pressure, and measurement. Its utilisation in lighting, heating, cooking, ventilating, and as a motive power. Photometric testing of gas or other sources of light. Residual products of gas manufacture, coke, tar, benzole, aniline dyes, ammonia, salts, &c. Oils, oil-gases, candles—their manufacture and use for lighting, heating, cooking, and motive power. Electricity—Its generation and application for lighting, telegraphy, motive power, &c. Hydraulic Appliances—Motors suitable for comparison with gas-motors, and apparatus for the measurement and regulation of the flow and pressure of water. Architectural Appliances—More especially those which relate to lighting, ventilation, heating, and lightning conduction; and architectural ironwork and sanitary appliances such as can be exhibited in the open grounds. Miscellaneous Apparatus—Gas-lighted buoys, fog-horns, miners' safety-lamps, fire-damp indicators, and apparatus for lighthouse illumination, ventilation of mines, &c. Awards for merit will be given for such classes of the Exhibits as the committee and exhibitors may arrange to be tested, or such other exhibits as may possess very special merit.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[ADVT.]

Holloway's Pills render delicate invalids suffering from loss of appetite, nausea, sick headache, dimness of sight, faintness, flatulency, or spasms the most essential service without inflicting any weakness or annoyance on their feeble frames. Low spirits, proceeding from congested or torpid liver, are removed by a short course of this medicine.

CHIPS.

A stained-glass window of two lights, representing St. Anne and St. Cecilia, has just been placed in the church of St. Petrock Minor, Padstow, in memory of the Viscountess Molesworth. Mr. Honwood, of Frome-Selwood, was the artist, and the work has been executed under the superintendence of Mr. Hingeston-Randolph, of Ringmore.

An inquiry was held at the town-hall, Lowestoft, on Thursday, the 22nd inst., before Mr. R. Morgan, C.E., one of the inspectors of the Local Government Board, respecting an application from the Lowestoft improvement commissioners, to borrow £5,000 for the beach outlet to the main sewer, and £2,500 for the improvement of Kinkley-street. The town surveyor produced plans of the various works, and stated that the rapid increase of the population from 13,000 to about 20,000 during the past ten years had rendered them necessary.

The Bristol Tramways Company have just entered into a contract with Mr. A. Krauss, who recently constructed the Hotwells line, for forming new lines of tramrails to the suburbs of Horfield and Bedminster, and from Old Market-street to Bristol-bridge.

A new Cornish Wesleyan Middle-class school is about to be built at Truro. The architect to the association who are promoting the undertaking is Mr. Edward Kendall, of Truro.

A set of pictures of the Stations of the Cross, paintings of Mr. Henry O'Shea, of Limerick, was solemnly blessed in the Dominican church at Tralee, on Friday.

A stained-glass window, the work of Messrs. James and Co., of Kentish Town, has just been placed in St. Augustine's Church, Highbury New Park, as a memorial.

A working men's club was opened at Bury, Sussex, on Saturday. It includes a large club-room, with six bedrooms over it for single men, a covered skittle-alley, and a cottage for the manager; tho total cost of erection was £1,100. Mr. F. Bacon, of Earley, near Reading, was tbo architect.

Tho foundation-stone of a new church at North Camp, Aldershot, was laid on Monday by the Duchess of Connaught. Mr. J. Edward K. Cutts, of Southampton-street, Strand, is the architect, and the cost of tho first section of the church will bo £3,050.

A new gas-holder, with Duncan's improved valves, has just been erected at the gas-works at Woodbridge, Suffolk; and also two new purifiers, with Clayton's six-way valves, and larger pipes and siphons. The improvements have been carried out by Mr. E. Buckle, under the supervision of Mr. B. D. Gall, general manager.

The Reigate Town Council had, on Friday, to elect a representative governor of the Grammar School and other charities in Reigate, in tbe stead of the late Mr. R. Hesketh, the City architect and surveyor. The candidates proposed were tbe son of the late governor, Mr. Robert Lempriere Hesketh, F.R.I.B.A., of London and Reigate, and the present Mayor of the borough, Mr. George Edwin Pym, architect, of Reigate. Tbe latter gentleman was elected by 10 votes to 7.

A bazaar was held at Horley, Surrey, on Wednesday week, in aid of tbe funds for restoring the parish-church, a work about to be carried out from the plans of Mr. Blomfield, M A., of London.

The Pontypridd highway board have adopted plans prepared by Mr. J. Griffiths, of Pontypridd, their surveyor, for an iron girder bridge over the river at Glawychydd Fawr, about tbree miles from Llantrissant.

Tbe Court of Common Council for the City last week negatived a proposition to refer to a committee the question whether the erection of an organ in the Guildhall would be practicable and desirable; it was stated that the City architect had reported the scheme as impracticable.

The system of the London Street Tramways Company is now in course of extension from Stamford-hill to Lower Edmonton, a distance of 4¼ miles. Tbe rails are being laid on the modern cross-sleeper method, so as to secure a uniform foundation for the rails and setts. The contractor is Mr. Jacob P. Batch, of Tottenham and Camberwell, and a large staff of men are employed on the work.

At the Holborn district board of works last week a question was asked as to the cost of the new town-hall, the original estimate for which was stated to have been £40,000, and the surveyor reported that thus far the expense had been £48,000, but "there were still many extras that could not be calculated upon."

Heinrich Drasche, one of the leading Austrian manufacturers, died on Saturday, in his 69th year. He was the first Austrian to employ porcelain and terra-cotta as house-building ornaments, and two-thirds of the new Vienna houses are built with his bricks. Employing thousands of hands, he established schools, libraries, and provident societies for them, lived in a modest style, and did not seek society. He leaves a property estimated at 20 million gulden.

Half the property on the Cedars Estate, Leytonstone, has been sold, and the other half is to be offered by Messrs. Protheroe and Morris, at the "Working Men's Hall," Stratford, on Wednesday next, the 4th proximo, at 7 o'clock.

Owing to some accident, the drawings sent in by Mr. J. Martin Brooks were not submitted to the council of the Royal Academy with the drawings of the other students. Tbis oversight, however, has now been rectified, and Mr. Brooks has been admitted as a first-class student.

An organ-case has just been fixed to the new instrument recently erected by Willis, of London, in Wentworth Church. The case is of oak, 8ft. 6in. bigh, and separated and panelled by traceried buttresses into five divisions, the end ones being recessed from the others. The upper part is very elaborate, and is formed of cusped quatrefoils and open tracery, with a moulded string-course with carved patterns of varied design, cut in relief. At the top is an embattled cornice. Tbe screen to the larger pipes in tbe recess is of a similar character. Messrs. Cbadwick and Co., of Masbro', have executed it, and Mr. William Dickie, building surveyor to Earl Fitzwilliam, designed it.

A new Conservative club was opened at Briarfield, near Burnley, on Saturday. Mr. Thomas Berry, of Burnley, was the builder.

St. Stephen's Green, which has been laid out as a public park for the citizens of Dublin by Lord Ardilaun, at a cost of £20,000, was thrown open on Tuesday.

The firebrick trade is being rapidly developed at Brierly Hill. For some months past trial sinkings have been going on in the Cricketfield Estate, in search of the Stourbridge seam of fire-clay, and the work has just been crowned with success. Till within the last few years this manufacture was confined to the parishes of Lye and Amblecote, but the present discovery will probably lead to the establishment of an eighth firebrick works within the town of Brierly Hill.

An application from the commissioners of Hove to the Local Government Board for sanction to borrow £5,350 for the construction of groynes, and £1,000 for works of sewerage, formed the subject of an inquiry held before Mr. Arnold Taylor on Wednesday week. Mr. Ellice-Clark, borough surveyor, explained the plans.

Two lions, of life-size, and modelled in terra-cotta, have just been placed in the porch of Mark Church, Somerset. They were modelled at Mr. John Matthews's Royal Pottery, near Weston-super-Mare.

A memorial-stone of the south aisle, now being added to the Church of St. Michael and All Angels, Walsall, was laid last week. Tbe work will be Early English in style, and executed in Hammerwich stone with Bath dressings. Mr. J. Veale, Wolverhampton, is the architect, and Mr. Garlick, of Saltley, the contractor.

A Local Government Board inquiry was held at Bury St. Edmund's, on Wednesday week, beforo Mr. R. Morgan, inspector, respecting an application from the town council for permission to borrow £6,000 for the extension of the waterworks. The scheme will be carried out from the plans of Mr. E. Rush Turner, engineer, of Ipswich, and under the supervision of Mr. W. Siggers, borough surveyor.

New day and Sunday-schools for the parish of Farington, near Preston, were opened on Saturday. Externally, they are built of pressed red brickwork, relieved with stone strings and bands of black bricks. The gables are finished with barge-boards, having louvres for ventilation; the roofs are covered with green slates, capped with red ridge tiles. The walls of chief rooms are plastered, and have wooden dadoes and open timber roofs carried on stone corbels, and the heating is by hygiastic ventilating grates. There is a mixed schoolroom 60ft. by 22ft.; girls' class-room, 27ft. by 20ft.; boys' class-room, 23ft. by 20ft.; and an infants' schoolroom, 35ft. by 20ft., as well as lavatories and cloak-rooms; at the west end is the master's residence. Messrs. Garlick, Park, and Sykes, of Preston, were the architects, and Mr. John Walmesley, of the same town, was the contractor. Tbe outlay has been about £3,500.

Tbe restoration of the north porch of Salisbury Cathedral has been commenced this week; the entire expenses will be borne by Mrs. Hamilton, the widow of the late Dean of Salisbury, as a memorial of her husband.

Trade News.

WAGES MOVEMENTS.

Leeds.—The threatened strike in the Leeds building trade has been averted, the masons and bricklayers having consented to a reduction of one halfpenny per hour, to take effect on Monday next.

Liverpool.—In the case of arbitration on the wages question, in dispute between tbe master-painters and operatives of Liverpool, Mr. J. F. Collier, the judge of the county court, the arbitrator, has awarded tbat the wages shall be 7¼d. per hour all the year round, such advance to bo paid from Tbursday, the 14th inst.

Westwood Quarries, near Bradford-on-Avon. (Established 150 years).

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering at any rate, of the accepted tender—it adds to the value of the information.

Belgravia.—For enlarging dining saloon and building servery, exclusive of decorations, for Major-General C. Baring. Mr. W. H. Collbran, architect :—
Hart £246 0 0

Belper.—For alterations to the workhouse chapel, for the Board of Guardians :—

Bodell, B.	£840	0	0
Thompson, J. W.	759	0	0
Dyer, T.	730	0	0
Marshall, W.	726	0	0
Limb, W.	723	0	0
Walker, J.	712	0	0
Hingley, A.	639	0	0
Wheeldon, Bros. (accepted)	632	0	0
Smith, A.	627	0	0

Brixton.—For erecting new wrought-iron fence to the Pightle Estate, Hanover-square, S.W. Mr. W. H. Gwyther, architect :—

Pack, Bros. (accepted).

Bromley-by-Bow.—For the erection of a school to provide accommodation for 1,300 children, in Bromley Hall-road, E., for the London School Board. Mr. E. R. Robson, architect to the Board :—

Staines and Son	£12,147	0	0
Brass, W.	11,410	0	0
Pritchard, G. S.	11,399	0	0
Harris and Wardrop	11,375	0	0
Sargeant, J. F.	11,339	0	0
Williams, G. S. S. and Son	11,285	0	0
Higgs and Hill	11,190	0	0
Wood, F. and F. J.	11,070	0	0
Cox, C.	10,963	0	0
Stimpson and Co.	10,850	0	0
Boyce, T.	10,700	0	0
Jerrard, S. J.	10,273	0	0
Kirk and Randall	10,244	0	0
Atherton and Latta, Poplar*	10,020	0	0

* Accepted.

[The school consists of a central hall on each floor' reckoned as providing accommodation for only 90 children' with the classrooms grouped around it. Cost of (a) school buildings only, including closets, £8,200; (b) tar pavement and playground, £530; (c) boundary walls and gates, £530; (d) teachers' rooms, £300; (e) schoolkeeper's residence, £350; (f) extra depth of foundations, £110; total, £10,020. Cost per head of (a), (b), and (c), £7 2s. 5d.; total cost per head, £7 14s. 2d.]

Burton-on-Trent.—For rebuilding Holy Trinity Church :—
Horsman & Co., Wolverhampton (accepted) £17,142

Bushey, Herts.—For board schools for girls and infants, for the Bushey School Board. Mr. H. H. Bridgman, A.R.I.B.A., architect. Quantities supplied by Mr. Frederick Thomson :—

Larter, F.	£2,848	0	0
Scrivener and Co.	2,798	0	0
Andrews and Son	2,797	0	0
Toms, E.	2,769	0	0
Chadwick, A. W.	2,648	0	0
Wall, C.	2,630	0	0
Hunt, J. R.	2,600	0	0
Waterman, G. and J. (accepted)	2,388	0	0

Castleford.—For additions to the cellaring at the "Lion Hotel," for Messrs. Beverley Bros. Mr. Geo. H. France, architect :—
Bagnall, Bros. (accepted) £81 12 0

Clapham, S.W.—For the erection of a school to provide accommodation for 600 children, in Wirtemberg-street, Clapham-road, for the London School Board. Mr. E. R. Robson, architect to the Board :—

Staines and Son	£5,897	0	0
Thompson, J.	5 765	0	0
Hunt, J. R.	5 762	0	0
Hart, H.	5,759	0	0
Marsland, J.	5,740	0	0
Lathey, Bros.	5,675	0	0
Tyerman, J.	5,650	0	0
Higgs and Hill	5,537	0	0
Nightingale, B. E., Albert Embankment (accepted)	5,483	0	0

[Cost of site (area 17,530 square feet), £4 607 14s. 7d.; cost of (a) school buildings only, including closets, £4,223; (b) tar pavement and playground, £268; (c) boundary walls and gates, £362; (d) teachers' rooms, £200; (e) schoolkeeper's residence, £368; (f) extra depth of foundations, £62; total, £5,483. Cost per head of (a), (b), and (c), £8 1s. 9d.; total cost per head, £9 2s. 9d.]

Forest Gate.—For new schools and chapel improvements for the Methodist Free Church. Mr. F. Boreham, architect. Quantities by Messrs. Mann aud Saunders :—

	Schools.			Chapel.		
Horlock	£2,287	0	0	£900	0	0*
Alexander	2,232	19	0	1,242	19	0
Sargeant	2,197	0	0	1,315	0	0
Godbold	2,110	0	0	1,260	0	0
Bangs	2,020	0	0	1,240	0	0
Morter	1,968	0	0	1,189	0	0

* In error.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 6, 1880.

IMPROVEMENTS IN BLOOMSBURY.

BLOOMSBURY only a century ago was quite a rural and isolated locality. Macaulay, in his sketch of London, gives us an interesting picture of the neighbourhood about the year 1685. He describes two celebrated palaces, "each with an ample garden," on the verge of pastures and cornfields, one Southampton or Bedford House, as it was afterwards called; and the other known as Montagu House, celebrated for its furniture and frescoes, burned to the ground, and which afterwards made way for the British Museum. Other writers and old prints show us, that the area between St. Pancras and the British Museum was open country, and the part immediately on the rear of the latter building was till the end of the last century a district well known for every kind of vice, and for the resort of footpads. Few have not heard of the "Field of the Forty Footsteps," a story of tradition, the scene of which is supposed to have been at the back of Montagu House; but we refer the curious reader to the works of Strype, Jesse, Dr. Rimbault, in *Notes and Queries*, Southey's Commonplace Book, &c., for further evidence of the condition of the locality, which has since become one of stately squares and streets. Few localities have perhaps witnessed such rapid change of fortune as Bloomsbury. It was once the patrician quarter of London, till the fashionable world moved westward, and even now many of the streets and squares wear a look of dull respectability. The architectural exterior of the houses is, by the caprice of fashion, somewhat more in keeping with modern taste than it was a decade ago; the shabby hue of the brick fronts with their square windows and faded window drapery, the wide doorways, with here and there some carved work in the style of the Adams, take us back to a period when internal convenience was more studied than it is now. Internally, many of the houses show indications of former wealth: the cornices and ceilings are in some cases excellent examples of the style of the beginning of the present century, the period at which many of the squares were built. The fireplaces are often designed in the best style of this age, the statuary marble mantel being enriched by the light and elegant festooning and fluted ornaments common to this period. But we hasten to notice a few of the more recent improvements. Bloomsbury-square, in Queen Anne's reign the head-quarters of fashion according to Macaulay, shows signs of reconstruction. On the west side a block of old houses is being remodelled, and Mr. Collcutt's red brick gabled house makes a prominent feature in the opposite side of the square. We have already illustrated this building. The north side was once taken up by Bedford House, which from the prints we have seen of it must have been all that the old topographers said. It was built by Inigo Jones, had a long and rather low façade with wings, and was crowned by a cornice and balustrade. The pediments of the lower windows and the central doorway must have been pleasing features. Behind the house were fine gardens, commanding in 1772 a view of the rising hills of Hampstead and Highgate. It would not be surprising to find that many of the modern houses show traces of the old mansion of the Wriothesleys in their interior fittings.

In Bloomsbury-street, at the corner of Streatham-street, a memorial infirmary is progressing towards completion, from the designs of Mr. Peacock. The structure forms an ┘ shaped building open on three sides. On the ground-floor there will be a dispensary on one side of the hall, and a commodious waiting-room, with physicians' and surgeons' rooms on the other side. Red brick with stone dressings are the materials employed, and the architect has relieved the front of the building by two slightly projecting gabled wings relieved by stone. The gables are treated in an Elizabethan style, being broken into segments and curves, and finished by small pedimental compositions at the apices, which have rather a stilted appearance. Dividing the stories are stone cornices and friezes, the latter enriched by triglyphs; and the angles of wings have stone pilasters. Relief has thus been liberally obtained, and the structure makes a rather strong contrast with the dreary stucco and brick of the neighbourhood. Red tiles have been used for the roofing. In the planning, the architect has, by the arrangement of the entrances, carefully avoided confusion; the patients, after receiving advice and having their prescriptions made up, can leave the building by a separate entrance from that by which they entered, the latter being provided in the flank side of the building, thus avoiding crowding in the Bloomsbury-street side. The position of the infirmary is a good one: it is retired from the main thoroughfares, and forms a striking finish to the block of houses. Mr. B. E. Nightingale, of Albert Works, is the contractor. Between Little Russell-street and Gilbert-street, the same architect has completed some parochial schools, intended for the united parishes of St. Giles-in-the-Fields and St. George, Bloomsbury, in lieu of the old schools in Museum-street. The front of the schools faces the former street, and is designed in the Elizabethan style, with an ornamental gable and side wing. Externally, stock and red brick and stone have been used, the latter material freely in the cornices, strings, doorway dressings, and gable. Crowning the latter is a pedimented tablet, with date, supported by a central pier, which divides the windows. Over the entrance wing is a niche with figures, and a tablet over entrance inscribed with the name and date of the schools. The façade has a neat but a little crowded appearance; the windows are plain segment-headed, with casements below and pivoted casements over the transoms. In the interior arrangement the most has been made of the area. The ground-floor contains a committee-room in the front, a hall and stairs, a cloak-room in an intermediate position, and a school or classroom in the rear, with a matron's room, entered from the passage, which is lighted by a side area. The stairs in front lobby are deal, with stained and varnished soffits and strings, and the rooms are paved with wood blocks set herring-bone-wise; the passages on all the floors being of artificial cement mosaic, which makes a hard, impervious, and effective floor. Landing on the first floor, the same general arrangement is repeated; there is a front room lighted by two windows with casements, and the upper ones falling inwards, and in the rear a long schoolroom, lighted from Gilbert-street, plainly finished, while the corridor leads to a large lavatory and bath-room, lighted from the same street. On the second floor a long schoolroom occupies the centre depth from front to back, ceiled to the collars, the angle struts being exposed. A lavatory and small room is obtained at the back, and the passages, as in the ground-floor, are well lighted from the side area. In the basement a dining-room, lighted by area, a kitchen, and a large laundry for the girls, fitted with every convenience, are provided. The Gilbert-street elevation is effectually finished in stock brick relieved by red brick arches and gable. All the fireplaces are of oak, in keeping with the style, and the fronts are filled, at the side of grates, with painted tiles. Hart-street, which now forms a continuous thoroughfare with King's-road and Theobald's-road, connecting Bloomsbury with Clerkenwell, has recently been improved in its architectural appearance. On its north side, a large red brick and stone block of offices and shops has been lately built, the main feature of which is an arcaded ground-story, of red granite shafts and stone arches, above which are spacious offices, with mullioned windows, designed in a Renaissance style. The brick walling and stone dressings are already beginning to lose their freshness; but the work is decidedly an improvement on the drabby hue of the stuccoed fronts in its immediate vicinity. As we pass Hawkesmoor's Church of St. George we cannot avoid reflecting on the justice of Horace Walpole's satire that the steeple is the master-stroke of absurdity, "with its obelisk, crowned by a statue of George I., and hugged by the royal supporters." Still, with all its recent improvements, the eastern end of the street looks unfinished, the unsightly bare walls at the end of Southampton-row and Red Lion-square giving a very rough and ragged appearance to the neighbourhood. In Theobald's-road, the strip of building-land on the south side, left by the Metropolitan Board, is gradually being filled up with shops. We notice two new blocks of white brick and stone in a rather nondescript style; in the first we come to, the windows are marked out from the front by a peculiar treatment, and each vertical tier is finished by a pediment, forming a series of narrow bays in the façade. The corner is simply canted off; but the manner in which the upper part is finished is simply "amazing," with its elongated corbels and blank space. There is a Manchester-warehouse look in the treatment, the effect being too stereotyped and mechanical to be good. Another block shows an attempt to introduce coloured brick and cement decoration. The latter ornament consists of a series of small panels of impressed cement in the piers of stock brick, and the effect is a trifle better. The harmony between the stock bricks of two tints and the brown mortar pointing is pleasing, and the treatment, despite its poor and meagre details, is an endeavour to do something fresh at least. Ornamentation in panels has not been attempted with any great success in London at present; but it has the advantage of enabling the architect to dispense with columnar and other forms of relief which are more costly, and cannot well be introduced in other materials than stone or brick. We see many gaps in this thoroughfare, and the very incomplete condition of its junction with Southampton-row and Red Lion-square is an unsatisfactory instance of the piecemeal way in which public improvements are carried on in London. Bedford-row, a fashionable locality in the beginning of the 18th century, seems slow to improve, though its old houses contain some fine panelling, staircases, and plaster-work. Between Southampton-row and Gray's Inn-road, many interesting specimens of old buildings still exist, if only an explorer be found to ransack some of the old houses before they are pulled down. In High Holborn we make note of a large new red-brick block of chambers, offices, and shops facing Dean-street, but without any architectural merit. The carved stone heads over the windows of first floor, and the meagre scanty cornice, give the façade a very commonplace warehouse effect, the only point of relief being a red-tiled roof. The shop-fronts are made slightly to project from the front of building. Before very long we may expect to see considerable reconstruction in this part of Holborn, and we hope that so fine a thoroughfare will not suffer from the change, as it will undoubtedly do if the warehouse style which threatens it prevails; and we should be sorry to see it transformed into a second Southwark or Queen Victoria-street. Taking a leap from south to north, we reach the neighbourhood of Euston-road, which is gradually improving. On the north side, next the Midland terminus, a nest of dilapidated houses has been demolished; in fact nearly the whole area known as Somers Town is open field again, Ossulton-street still remaining as the western boundary. We are glad to find this great thoroughfare, connecting the leading northern railway termini, is about to assume a new aspect.

MISUSE OF THE PILASTER.

In these days of architectural cribbing it is not surprising to meet with designs and buildings which exhibit little respect for recognised authorities. What the source of inspiration is, whether the designer borrows from good or second-rate examples, would seem to be immaterial questions to those who are content to copy features. But common-sense at least ought to have some influence in determining whether certain features can be applied or not. It should certainly decide the propriety or otherwise of using details which at one time were intended as intelligible and meaning adjuncts to buildings. For instance, a column or pilaster always, till the worst period of the Renaissance, expressed some kind of support, and it is obviously absurd, unless architectural forms are to be employed as meaningless jargon, to introduce such a feature without some apparent motive. As a pilaster expresses support, we take it that anything like a sham pilaster, used in total forgetfulness of this principle, is a violation of all architectural meaning. In all forms of literary composition, if we use a word or a phrase ambiguously, in defiance either of the rules of grammar or metrical arrangement, we are held up to deserved ridicule; in architecture alone among the fine arts rules of composition have lately been set at nought, and looked upon as the mark of inspired genius. It is not a sufficient excuse to appeal to the vagaries of the Renaissance to justify the irregularities we see repeated. The architects of that period were passing through a stage of transition, and their work we look upon as thoroughly representative of the 15th and 16th centuries, and as truly expressing a style of their own, as the poetry of Spenser or the essays of Bacon in the Elizabethan period of English literature. As the diction of that age was eminently striking and picturesque, so the architecture, by its admixture of English and foreign elements, became a distinct and pleasing combination of features. Architects have never done imitating the picturesque forms of Elizabethan building. What would be said of our authors and poets if they in like manner copied the style of the "Faërie Queen" or the "Shepherd's Calendar"? Now, the pilaster is essentially a feature borrowed from the Renaissance, but in all good examples we find it expressing support, even although it be reduced to a mere superficial strip of stone. But, by some freak of fancy, we have lately noticed it employed as a meaningless ornament, supporting nothing, marking no separation, and implying no structural function whatever. In a few recent buildings we have seen, the pilasters are placed as isolated ornaments, attached to the wall of the ground-story without anything above them; in another instance we find they have been introduced on the top of a string-course, carried by corbels below their bases; and a very common misuse of them consists in making them rest on the keystones of window-arches. To introduce pilasters as mere pedestals is, perhaps, the greater folly; but in all these instances the feature has been misapplied, and we question whether any good precedent can be found for it. A rather favourite device with some architects is to pile up narrow piers of brickwork upon pilasters, a practice only a degree better than stopping them at the capital; and we have even noticed the monstrosity of piling pilasters over one another without any intervening entablature; the base of one resting on the abacus of the lower. In the employment of the entablature as a horizontal separation between stories we find a confused sense of the meaning and value of its three component parts: the architrave is occasionally repeated in the heads of the windows, even if the two architraves are thereby brought close together; we frequently meet with a depth of entablature quite disproportioned to the façade; for instance, we often see the entablature between the ground and first stories proportioned without any reference to the heights of the stories or the order. If we notice any good building of the Revival, such as Inigo Jones's design for the façade of Wilton House, the observance of the rule we have hinted at is found. There is no order, but a broad pleasing effect of proportion is attained by omitting the frieze and architrave, and crowning the building by a block cornice. This feature connects the lofty angle blocks, and is well proportioned to the height of the façade. If the architect had introduced the full complement of the entablature, the height would have been reduced and the employment of an order or pilasters required. As it is, the composition is classical and elegant, while there is an avoidance of the mechanical appearance a row of pilasters would have had. In modern buildings we find very little consideration is given to these matters; whole entablatures are employed with and without an order of columns or pilasters below. What we contend is that architects have an interest in preserving the intention of these features, and that by misapplying them they bring the art and profession into contempt. We might point to the ridiculous manner in which arches are sometimes used; as, for example, the employment of a relieving arch over a thick lintel for a small opening, thereby exhibiting excessive precaution, one of the "fads" of the Gothicist; the incising of ornament on arches and lintels in which all idea of the true function of those structures is lost sight of, and a variety of other faults which would take far more space than we have at our disposal. If architectural features have a definite purpose in the formation of a style, if we look upon them as the outcome of wants expressed in stone or brick, let us at least be consistent in their use. But the question turns so intimately on style, that we may be led into a longer and more abstract discussion than we should care to enter. We suspect many of those who follow their own devices and conceits in these matters apply the motto of Buffon to themselves who said "Style is the man"; in other words, style is the simple reflection of an artist's personality found in the work of every artist who has any. But this definition does not apply to those who copy only to pervert, as the school does to whom we have been referring. The remarkable point in the misapplication we have alluded to is that its followers are chiefly copyists: they carefully mimic features for the purpose of employing them in any connection they like. If this misappropriation is the personality of the artist, we say no more: we can only say it is not art. Again, it would puzzle the future historian or lexicographer of architecture in describing or defining features that had lost their original import.

THE VICTORIA EMBANKMENT.—A CONSTRUCTIVE STUDY.

(*Continued from p.* 116.)

On proceeding to the western extremity of the Embankment, we find the more pretentious wall, shutting out from the view of the passers-by the aristocratic Whitehall quarter, better in character, although built of gault bricks and Portland stone. The bricks do not appear to have suffered so much, but the stone is very uneven in quality, and of divers shades and tints, much of it being already green from incipient vegetation.

This stretch of river-side Embankment may be regarded as the most convenient carriage and footway within the Metropolitan circle. It is well and judiciously planted with trees, which already afford good and grateful shelter from the summer sun. The carriageway is substantially formed, and finished at top with Guernsey granite "Macadam," and its well-rounded surface offers a ready and efficient means for the passage of the water during storms of rain. The footways are laid with York flag or paving, but it already shows signs of incipient decay, owing to the laminated character of the sedimentary deposit from which it is derived. It is almost impossible to so obtain the York landing or "flag" from the quarries as to secure its being laid in its quarry or natural bed. The result is, as we see in the dilapidated condition of both pavements, where there is hardly one stone free from damage caused by the action of water or frost. The stone is naturally absorptive in character, and when its original surface is cut through, it permits the passage of water between its thin and clearly-defined "leaves." Frost supervening under such circumstances exerts a too-easily acquired mechanical force, which readily degrades the stone, separating by its insidious action one lamina from the other. The fitful and irregular character of last winter had a most prejudicial effect on the York pavement of the Victoria Embankment, and frequently in the early morning after a slight frost, great quantities of loosened sandstone could be seen strewed all over its surfaces.

It is almost a pity that those who designed and carried out this great scheme did not consider whether the passenger-traffic would have been better had it been confined to the centre of its whole width, and a double row of trees planted. By such an arrangement the carriage traffic would have been split, and a wide and convenient promenade of goodly proportions secured for pedestrians.

In our traverse to and fro we have not taken notice of the buildings on the Embankment, or those which we may say flank its two ends. St. Paul's at the east, and the Houses of Parliament at the west, illustrate to the constructive student perhaps two of the most practical and profitable lessons he could read. The grand and imposing Metropolitan Cathedral, now nearly two hundred years old, was built with the famous and best bed of Portland stone from the Oolitic limestone formation, and, notwithstanding the neglect it has met with at the hands of its clerical custodians, continues to maintain a goodly appearance, and if the soot and other impurities with which its exterior is impregnated were removed, the pristine beauty of the fine old building would gladden the sight of Londoners and visitors from all lands. But at the western end of our stroll we find the nation's houses of legislature, although but recently erected and finished not much more than thirty years ago, in a chronic state of decay, requiring the utmost vigilance to maintain its crumbling parts in a safe and habitable condition. The stone used in building the Houses of Parliament was obtained from the Magnesian limestone deposits of the Permian formation, and before its selection a commission was appointed to examine and report on the best-known building stones of England, Wales, and Scotland. The examination was a most exhaustive one, and resulted in a report of great and interesting value; but it failed to secure a durable stone for the most important building in England, if not in the world. The accomplished architect of the Houses of Parliament, if he had not the trials of vexatious personal interference experienced by Wren, was surrounded by a large and influential crowd of advanced scientists, who were instrumental in almost forcing upon his acceptance a stone which, even before the completion of the building in which it was used, gave evidence of premature decay. Nearly every quarry producing building stone of any note in England, Wales, and Scotland, was most carefully examined, and a very valuable report from the commissioners employed published of the result of their labours—geologist, mineralogist, chemist, and practical constructor combining in their respective experiences and knowledge to produce the most accurate record of their investigations. Such report was received with confidence by the public from the well-known ability of those engaged in its compilation, and the architect accepted, without the least hesitation, the stone adjudged by so important a tribunal to be best for his great work. The result has been too often deprecated in these pages to need further mention.

The lesson to be read from a careful and studious examination of these two noble architectural piles is a useful one, and so far as the respective qualities of the stones of which they are built is concerned, of the utmost importance to the constructive student. The chemical analyses of the Anston and Portland stones, taken from the commissioners' report, are as under:—

	Anston.	Portland.
Silica	3·60	1·20
Carbonate of lime ...	51·10	95·16
Carbonate of magnesia ...	40·20	1·20
Iron alumina	1·80	0·50
Water and loss	3·93	1·94

While the weight of the two stones was, in their ordinary condition, as follows:—

Anston about 152lb. per c. foot.
Portland about 145lb. per c. foot.

Their absorptive proportions being the magnesian 0·174, and Portland 0·206, when thoroughly desiccated.

Another good example of the durability of Portland stone may be seen on our line of route at Somerset House, finished in 1780. Until the construction of the Victoria Embankment, our knowledge of this magnificent building was limited to the front in the Strand, for the river front was inaccessible except by boat at high water. The bold carving and rusticated quoins of what may be called the basement of Somerset House remain apparently, after a hundred years' exposure to a London climate, perfect in character, forming a marked contrast to the adjoining granite structure of Waterloo Bridge, which has not been built much more than half a century.

Another structure, the Temple Library, in the Temple-gardens, furnishes us with an illustration of the stone of which it is built being unable to withstand the London atmosphere. The stone is from the Oolitic formation, having been obtained from the Great or Bath Oolitic group, being below the Portland stone beds, from which it is separated by the Kimmeridge and Oxford clays. The Temple Library was finished in 1861, and is, therefore, not yet twenty years old; but at the present time it exhibits the most marked signs of decay, and the external faces of the buttresses especially, may be rubbed off with a slight pressure of the hand. There is no building that we know of in London where is a better, or rather a worse, illustration of the unsuitability of this particular stone of which it is built for a London site. Those intrusted with its preservation should lose no time in repairing, as far as possible, the ravages of this disease of stone, for we can call it by no other name. There are some buildings adjoining this structure upwards of 200 years years old, that show no such signs of decay as the Temple Library.

The School Board of London's new building between Temple Station and Temple Library already begins to indicate that the stone used is not proof against the insidious attacks of a polluted atmosphere.

We have said enough to show that much useful information may be obtained by a careful study of the building materials we have named, and there is perhaps no similar opportunity to be found in London for such an examination as a stroll along the Victoria Embankment. In describing the walls, &c., of this most important work we have not separated the artificial products from those obtained from natural sources. Although the bricks undergo certain manufacturing manipulation, the materials of which they are composed are natural clays. There is, on this same embankment, a very well-known artificial stone which, at the Temple Station, where it is used to a considerable extent as ballusters and coping, unfortunately shows marked indications of decay. The external efflorescence, accompanied by decomposition, of the more exposed ornamental lines, indicates either that artificial stone so made is unsuited for the climate or atmosphere in which it is thus placed, or that some errors were committed in its preparation. We have not found that this artificial stone from our own careful observation is competent to resist the wearing action of this climate in external works, although the examples we have seen in the interiors of buildings show its high capacity for internal decoration generally. The process by which it is prepared is a chemical one, and therefore, any mistake in the proportion of the materials, or carelessness in their final manipulation, would be sure to lead to the results above described.

The Victoria Embankment not only represents the best examples within our reach of building materials, but may be regarded, from a utilitarian point of view, as the most successful constructive undertaking of modern times. Primarily designed to secure a more uniform margin to the river shore, it, at the same time, utilised the unsightly mud banks, which, at low water, were both unsightly and unsavoury. Besides that, however, it provided for the main drain and subway, while, subsequently, the Metropolitan District Railway Company took advantage of its substantial surroundings to construct their line underground.

We trust that when plenary power is vested in the Metropolitan Board to control, without the chance of opposition from privileged gas and water companies, that the well-designed subways will be utilised and devoted to the purposes for which they were originally dedicated. When gas and water companies have the power which enables the obstinate officialism with which they are, unhappily, too frequently associated to reject the use of such accommodation, it denotes blundering legislation, the rectification of which should be at once set about. The vendors of gas and water to such a population as that of London should not hesitate to adopt every improvement, more especially when they are undertaken and carried out by a competent board, which will reduce the risk of accidents, and improve the means by which these indispensable supplies are distributed. By the use of subways, all chance of explosion or waste would be prevented, and certainly a great saving in the wear-and-tear of pipes, which now in their deeply-imbedded trenches are continually being damaged by oxidation, and under such circumstances, other unavoidable destructive causes.

The Victoria Embankment, therefore, secures the triple advantage of river, road, and railway accommodation, to say nothing of the great public benefit secured by the main drain, which conveys a large amount of the West-end sewage to the river outfall.

In the frequent reparation to the carriage-way of the Embankment, the best means are adopted for the maintenance of a first-class "Macadam" surface. The granite is carefully broken to the regulation size, and laid on the freshly picked-up and rougheued surface, which is afterwards coated with finely-broken granite, on which is put a thin covering of clean sharp pit-sand. On this well-proportioned mixture the steam roller is passed to and fro until it assumes a dense and solid character. When finished, the accurate contour of the road testifies to the care bestowed in its formation, and if these lines could be maintained for any length of time, the most exacting metropolitan ratepayer could not grumble at its cost. In a very short period, however, the traffic in its hammering action disturbs this fair and pleasant-looking road, producing ruts, mud, and dust, showing too clearly that it is only a question of time, and a very short time too, when this good and apparently substantial surface will have again to be repaired.

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A RECENT VISIT TO RUSSIA.

HAVING glanced at the inclosing walls of the Kremlin, at Moscow, we will pay a visit to the principal buildings in the interior. These are situate on the lines of the north-west and north-east walls, which form two sides of the triangle, the south side being occupied by the sloping terrace descending to the bank of the river. Of the age of these buildings it is difficult to speak; a great part are the work of this and the last century; but the churches and part of the old palace, although we are told that every portion except the inclosing walls fell before the great fire of 1737, bear evidence of considerable antiquity. The most conspicuous object, and one that occupies a very central position, is the

TOWER OF IVAN THE GREAT,

built by the Czar Noris Godunof in 1600. This is an octagonal tower of three stages, each of which in the upper part is pierced with arches for the admission of bells. This tower is terminated by a circular stage enriched with gablets of an Asiatic type, and capped with an ogee or bulb-shaped golden dome. This tower, with the surmounting cross, is 320ft. in height, and, being accessible to the public, is ascended in the same manner as our London Monument to the Great Fire. From the basement being occupied as a chapel dedicated to "St. John of the Ladder," it may, although grouping in with the Coronation Church, be considered a church of itself. Like the adjoining fabric, it is a brick construction, the face of which is stuccoed and finished white or light buff. Adjoining the entrance to this tower, and open to the court or terrace of the Kremlin, stands the

GREAT BELL OF MOSCOW.

From our boyish days upwards we have heard of this great and unfortunate bell; but we were scarcely prepared to find it so colossal in its proportions. It is truly called the "King of Bells," a title it by no means loses when compared with the greatest of the 34 bells, the Assumption-bell, of 64 tons, in the adjoining tower, for it is given as 200 tons in weight. This great bell is something over 21ft. high in the casting, and 26ft. 4in. to the top of the ball and cross. Its circumference at the top is 26ft. 3in., and at the rim 67ft. 11in. From the lower part a piece is detached; this, placed alongside, is 7ft. high, 2ft. thick, and 11 tons in weight. The value of the metal in this bell is given as £350,000. The founding of large bells in Russia has for many centuries been a matter of prime consideration. History records the casting of one at Moscow in 1553, the weight of which was about 16 tons, and a Polish traveller in 1611 relates having seen a large bell, the clapper of which was moved by 24 men. Another traveller records the casting of a great bell about 1600; half a century later this was recast, when its circumference was 54ft., and its weight over 100 tons. This bell was broken in a fire in 1706, and, with additional metal of gold, silver, &c., was recast as the present bell in 1733. Four years later it shared the fate of its predecessor, being broken in the fire that wrecked the Kremlin in 1737. This bell, in its fall, was deeply imbedded in the ground, where it lay for close upon a century; it was owing to this circumstance that Napoleon abandoned the idea of bearing it away as a trophy of war. Its exumation took place in 1836, when it was placed upon the present base of stonework, which is about 5ft. in height, and through which a gateway is formed to give access to the interior. The iron hammer, or clapper, lies on the ground beneath the bell, and the broken piece is placed against the outside of the base, immediately below its original position. The bright particles of metal in the section show how largely it is composed of gold and silver, and this has led to the supposition that the fractures were caused by the imperfect cohesion of the metal, owing to the ladies of the Court of Queen Anne, casting into the furnace their ornaments of gold and silver. An inspection of it clearly shows that it has been fractured by fire, for the lines of breakage may be traced in other parts than that where the great fault exists.

In the inspection of this great citadel we are impressed with its resemblance in arrangement to the Acropolis of Athens. It was the residence of the reigning prince or head of the State, in which he was surrounded by his relatives, his courtiers, his clergy, his nobles, and his ministers of war and justice, all of whom had their quarters or official residences, and their buildings of a public character, which were protected by every art then known to warfare.

OF THE ANCIENT PALACES

of the kings there is little to be seen, the fire of 1737 destroying all but the principal walls, some of which were removed to make way for new palaces, and others restored to somewhat of their former state. The most perfect is the portion called the *Terem*, or residence of the Queens of the older dynasties. In this building they and their children lived in a state of seclusion; their only participation in scenes of State being by looking down from a window into the King's Hall. This system of seclusion, set aside by that great reformer, Peter the Great, suggests the Eastern origin of the people; and although a custom dead to the outer world, it is one deeply-seated in the true Russians of to-day. You see it in the shops and bazaars of Moscow, which are exclusively peopled by the male sex. The custom of drawing assistance from females, or of the wife attending to a part of the customers, or of doing work that publicly exposes her, is practically unknown. This building consists of four stories, which, in the form of terraces, gradually diminish, until the upper one is only a single room. The principal apartments are the dining, reception, and throne-rooms. Outside a window of the latter apartment a box was formerly fixed, into which petitions intended to reach the hands of the Tsar, were placed by the people. Next to these come the oratory, and the council-chamber of the nobles; the original use of the latter was for the king's children, the nobles being then received in the Throne-room, the room in which the Earl of Carlisle, the Ambassador of Charles II., was received in 1664. These rooms are mostly vaulted, and decorated with Italian ornament, executed to the order of the late Emperor Nicholas, who restored the building between 1836 and 1849. There are other portions of the old palaces; but as they have passed through a severe restoration, in some instances at the will of the architect in charge, in others, based on drawings, &c., of the 17th century, they do not possess an interest that calls for a lengthy notice. One part of the old buildings is called the Hall of St. Vladimir. This is truly a Venetian building; the ground-story is stuccoed to represent blocks of stone, with sunk or drafted joints, the face of each block being raised to a point in the centre, in the manner common to us in our Elizabethan architecture. This rusticated work has been repeated in the walls of a church in the Chinese part of the city, where it has been the subject of native decoration, the rustications being coloured black, white, red, and yellow; one colour to each of the four faces of the individual blocks. In the case in point, there is no attempt at this savage style of decoration; the finish being the resemblance of stone. This lower part, as if for safety, is unpierced with windows; but in the upper story, the wall-facing of which is plain, there are numerous windows of Classic type, the details of which, in the form of sills, columns, pediments, &c., are very imposing. Ascending to this upper story is an imposing flight of steps, known as the "red staircase," "red" being the equivalent of "beautiful"—a term that appears again in the "red [or beautiful] square" outside the Kremlin walls. This staircase—used on State occasions, when the Emperor leaves the palace for the "Cathedral of the Assumption" or the "Coronation Church"—was in old times the principal outer entrance to the palace, in which position it was associated with some thrilling scenes of Russian history. It was here that "Ivan the Terrible" drove his spear through the foot of an unwelcome messenger, and pinned him to the ground whilst he read his despatches; and it was here that he gazed upon the dreaded comet which was believed to foretell his dissolution.

The palace proper of to-day is a large erection with a southern aspect, the building of which was commenced on the site of an older palace by the late Emperor Nicholas in 1838. The former palace, an erection in its turn of the great Catherine upon the site of a still older building, was, after being occupied in 1812, destroyed by Napoleon upon his retreat from the city. This is an extensive building of three floors, with a fourth occupying the centre, the latter being roofed with an ogee dome square in plan, surmounted by one of those truly national nedular spires. The architecture is inferior to that of any modern public building we have seen in Russia. Roughly speaking, the design, with its piazza on the lower story, is Classic; but the details have been handled by an artist largely influenced by the native style or type of architecture, and hence it is a building which in point of design is truly incongruous, and one the like of which it would be difficult to find in the new capital. This is known as "the Great Palace," and is the residence of the Czar when visiting the old capital of Moscow. Some atonement is made for these shortcomings in the interior of the building. The vestibule is supported on grey granite monoliths, which lead to a staircase of the same material. The drawing-room of the Empress is white and gold, upholstered in white silk. The study of the Emperor is fitted up with inlaid woods, and upholstered in red silk; and in an adjoining room is a mantelpiece of polished malachite. The state-rooms, on the first floor, are well appointed, and enriched with massive objects, such as vases, candelabra, &c., of crystal, manufactured at the Imperial Glass Works at St. Petersburg. The Hall of St. George, the patron saint of Russia, is an imposing apartment, 200ft. long, 68ft. broad, and 53ft. high. The granite columns are here surmounted with capitals of zinc, over which are shields supported by sculptured figures; these shields are inscribed with the dates, &c., of Russian conquests, extending over three and a half centuries. This room is furnished in black and gold, and upholstered in orange silk. The cost of lighting this hall is very great, for we are told that it requires 3,200 candles. There are several halls in this great palace which are but little inferior to the above in size, and in which the cost of lighting is, if anything, on a more extensive scale. Near this palace stands

THE TREASURY,

a building of three floors. The windows on each story of this building are symmetrically arranged, and between each are large attached columns, the lower orders of which take the ground as first story, and the shafts and capitals the two upper ones. The purpose of these columns is to support the cornice and the blind or plain parapet above. These shafts are remarkable in the drum of the same being enriched with an incised ornament, the outlines or bands of which are Saracenic or Moresque, and the filling-in, or wrought portion, an arrangement of the Greek honeysuckle. This building was erected in 1851, and in its contents it bears a resemblance to the Tower of London. The collection here carries us back to the old times, when Russia was classed as an Asiatic power, seated on the north of the Euxine; when her wealth was counted in costly works of art, in precious gems, and in valuable metals; when her tributes and complimentary gifts were received in articles of this description, which, as set out in our Biblical literature, was the primitive type of movable or exchangeable wealth. We have here works of Eastern art drawn from India, Persia, Armenia, and Greece, the gifts and tributes of princes, and the acquisitions of the wealthy nobles, and, last of all, the gorgeous trappings of the half-civilised but splendour-loving kings or emperors. These objects have been subject to many vicissitudes, one of which was the great fire in 1737, when many of the most interesting objects were destroyed; another was the moving of the seat of Empire to St. Petersburg, where they took rank amongst objects of Western civilisation.

Before the advance of Napoleon, the remainder of these household gods were removed east to the great trading city of Nijni-Novgorod, from whence they only partially returned to the ruined palaces of the Kremlin. One part of this great museum is devoted to ancient national armour of iron and steel, a collection, the loan of which, could such a thing be arranged, would be highly appreciated in this country; another part is devoted to ancient firearms, amongst which are some English fowling-pieces, presented to the reigning Tsar by one of our countrymen, of name Tobias Smith, in 1614. Here are also the coronation chairs of the early Romanoff kings, and here is the *baldacchino* still used in the ceremony of crowning the Emperors; and here also is the throne of Poland, removed from Warsaw in 1833. Near this is an old ivory throne, brought from Constantinople in 1472, when a princess of that house was espoused by the reigning prince of Russia—this is a fine work of art, rich with mythological subjects. This throne was brought into use so late as 1856, at the coronation of the present Czar. Alongside is a

Persian throne, brought to Russia in 1660—this is a costly object, being studded with 876 diamonds, 1,223 rubies, and numerous other stones of great value. Before these thrones is a magnificent orb, the gift of the Greek Emperor Basilius to the reigning Grand Duke Vladimir, better known as "St. Vladimir," who introduced the Greek faith into the country in 981. This gift was accompanied with a crown, a collar of gold enamel set with precious stones, and a chair with a piece of the true Cross. The orb is studded with 58 diamonds, 89 rubies, 23 sapphires, 50 emeralds, and 37 pearls. The enamels are fine works of Greek art, representing in their several plates scenes from the life of King David.

Allied to different associations are the crowns of conquered kingdoms. Here is that of Simeon, Tsar of Zazan, the date of which is about 1550. This is surmounted by a topaz and adorned with rubies, pearls, and turquoises. Here are some early associations of England, which bespeak the friendly relations existing between the Court of Russia and that of our Queen Elizabeth. It would appear that the Tsar, Noris Godunof, contemplated a war upon the infidel Turks, and that he sought the aid of our Queen. This aid she refused; but in place of it she lent her countenance to the movement by presenting the Russian monarch with a state carriage and eight horses. This large carriage is still preserved. The panels are painted with allegorical allusions to the crusade. It is an old pole carriage hung on straps, and the framework of the body is covered with crimson velvet. To this our Queen added the Order of the Garter, which, together with the patent for the same, is here preserved.

One room is set apart for the exhibition of old gold and silver work, some of which dates back to the twelfth century. Here are some examples of English workmanship, which reached the Russian Court as presents made by the ambassadors of James I., Charles I., and Charles II. The latter, through the hands of the Earl of Carlisle, the English ambassador, is far the richest, consisting, as it does, of two jugs of chased silver, two vases of *vermeil*, surmounted by armed cavaliers—the entire weight of which is 24lb.—two large jugs, two candlesticks, and four dishes of silver.

(*To be continued.*)

HEALTHY DWELLINGS.*

THE title at the heading conveys the object of a large and growing class of literature, in which recent improvements in hygiene form the staple of information. We are already besieged with books of this kind, by which their authors, with good intention, are endeavouring to instruct and enlighten a large community. As in other branches, they can be arranged into good, bad, and indifferent. Some seek to methodise and arrange the vast accumulation of facts and data, and to apply them to our wants, while the larger class are content to collect at second-hand and to publish information which has been better done by others. Captain Douglas Galton has just published a large octavo volume of Observations on the Construction of Dwellings, Hospitals, Barracks, &c., which is brimful of information obtained from a variety of authoritative sources, although we find nothing original or new in it. The object of the author has been to "present in a condensed form a short *résumé* of the very scattered information which exists bearing on the construction of healthy dwellings, whether houses, hospitals, barracks, asylums, or prisons"—information embodied originally in a course of lectures delivered to officers of the Royal Engineers at Chatham. The first chapters treat on the healthiness of a site, effect of soils, arrangement of dwellings on a given area, purity of air, &c. These are full of statistics interspersed with the enunciation of principles, though many of the latter are commonplaces, and would have been as well omitted, and the arrangement of the matter is rather disconnected and wanting in method. Generally, the book suffers from the "paste and scissors style," in spite of its usefulness. Chapter VI., on cubic space and floor-space, contains some valuable information for the architect. We perfectly agree in the conclusion that the best of ventilation arrangements give us only an approximation to the condition required, namely, in which the emanations from persons in a room are instantaneously and uniformly diffused through the whole space. Most systems give unequal parts of pure and contaminated air. From Professor Donkin's demonstration the size of a room does not affect the condition of the air in it, but the condition of air depends only on the rate of production of poisonous emanations, and that of the admission of fresh air, though, of course, the larger the room the longer it takes to reach a condition of impurity. Practical experiments show that about 1,200 cubic feet of air admitted per hour in barrack-rooms keep them in fair condition; that it is better to have outside walls to barrack rooms, and this principle of planning is now adopted. The porosity of walls is a point that is not much considered, though an important element. A very good remark is made respecting the height of rooms. Mere height, unless combined with means for the removal of the heated air at the top, is of little or no value, such, for example, as a lofty room with a space above the tops of the windows, where the expired air ascends, cools, and falls down. The proportion of floor-space in any room must depend, therefore, on the ventilating arrangements as well as the height and the planning.

In well-constructed wards, with opposite windows, 24ft. wide, the floor area can be minimised, and an area of 90 square feet per bed would be sufficient for ordinary cases of sickness. To a certain extent, floor-space should govern cubic space, for we might imagine a lofty room, but a space around the bed insufficient for nursing; hence in a hospital the existence of a clinical school supposes, of course, a larger area per bed than that given above. The dilution of air and its movement forms a separate chapter, the formulæ being given; a more practical one deals with the efficient ventilation of rooms. Capt. Galton says: "Air should not, as a rule, be introduced near the floor-level. The openings would be liable to be fouled with sweepings and dirt. The air, unless very much above the temperature of the air of room, would produce a sensation of cold to the feet." He recommends the orifices to be above the level of the heads of the occupants, and the current directed towards the ceiling and subdivided by numerous orifices. The following is a judicious observation:—"It is of importance not only to shut off the staircase from the basement, but to provide fresh air to the staircase; and when open fires are used, to supply each room in which there is an open fireplace with its own supply of fresh air. If the temperature of the room is to be kept up to a pleasant heat, this must, to some extent, be warmed air." Some useful hints are given regarding the inlets; these should be at least 2ft. from the ground, with paved and drained surface near; the channels for admission should be short, direct, and accessible for cleaning; long channels collect dirt. Underground channels for air modify the temperature of air; hence they are best of rectangular shape, so as to afford a large surface also made of conducting materials. But they should be impervious to ground-air and be perfectly dry. As a London fog is hardly perceptible at a height of above 100 yards, it is thought the best way of bringing pure air into a large town would be to draw it down a high shaft. The Victoria tower has not been utilised as it might have been to supply the Houses of Parliament. Speaking of the temperature of the inflowing air, it is thought from 68° to 75° a desirable one to prevent it feeling cold on entering; the air should also not be too dry. A good air-filter is sliced sponge, which may be readily washed. A few useful cautions are given respecting extraction-shafts that may be worth more attention from architects than they are likely to receive. Capt. Galton says: "It is advisable that, as far as possible, extraction-shafts from different rooms, the operation of which depends on temperature, should be independent of each other." By this means a reverse current cannot enter another room. Descents in the shaft ought, too, to be compensated for by increased height of shaft or increased temperature. The chapter on simple ventilation will be found pretty exhaustive of the chief methods in use, and the principles are clearly pointed out; but we notice the omission of several recent contrivances. The effect of wind blowing against an outer wall of a room, with apertures on each side, is to cause the air to force its way in on the windward side, and to cause it to be extracted on the opposite side. Sherringham's ventilator is recommended; indeed, the author does not say much in favour of the vertical tube admission plan, inasmuch as it forms receptacles for dirt, insects, &c., which affect the air; but it is only fair to say this objection might be easily obviated, as dust will collect more readily in a ventilator placed near the ceiling. Rooms with only one outer wall alter the conditions of ventilation, and a vertical tube carried from near the ceiling above the roof is recommended, when an Arnott valve cannot be used. The principles upon which such a tube operates, and the disturbing conditions which often turn outlets into inlets, are pointed out, and will be found of value. For instance, the conditions which will favour the application of those forms of shafts, which are supposed to act both as inlets and outlets, as Watson's, Mackinnel's, and others, are clearly stated. All these ventilators, as Capt. Galton shows, can only act in a closed room, but when other openings occur, as when doors and windows are opened, both parts operate only as outlets. For churches and chapels warmed by stoves or hot pipes, and with closed doors, they answer. We are rather disappointed at not finding any allusion to such useful forms of ventilators as Boyle's, and other systems of extraction. In the Chapter on Warming, the author alludes to conclusions we have lately referred to—the effects of warming by open fire, and by warmed air—and the remark is worth making again that the condition of comfortable warmth is to introduce means to warm both the walls as well as the air. High-pressure steam is preferred to hot-water pipes. A few interesting diagrams are given to illustrate the action of open fireplaces. The chapter on Ventilation, in combination with warmed air, is one of the most interesting in the book; this is illustrated by some experiments made by Professor E. Wood, of Harvard University, upon the effects of currents in a hospital ward at Boston, in the United States. The effect of admitting warm air at the lower part of the ward on each side, and allowing it to escape at a central opening in the ceiling, is shown by a diagram to leave the air stagnant at the upper corners of ward over the beds, and also in the centre of ward for a height of

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[*] Observations on the Construction of Healthy Dwellings, &c. By Douglas Galton, late Royal Engineers, C.B., Hon. D.C.L., F.R.S., &c., Oxford: Clarendon Press.

about 8ft. from the floor-level. These facts show the advantage of extraction shafts in other parts besides the centre of a ward, and the use of stoves to create a circulation of the air. Ventilation of prisons on Jebb's and Morin's plans is touched upon; but the author prefers the removal of air from the upper part of each cell by a shaft with openings at the floor and ceiling, the upper or lower one being closed according to the weather. To warm the air at some central part, and to distribute it through the building, is, no doubt, the most economical for large buildings.

In speaking of internal arrangements of buildings, a good hint is thrown out—viz., to insert fireclay slabs, projecting all round the walls of a room 6in., to receive the beams and to finish the plaster ceiling. It would act also to check the passage of fire from story to story. Many of the other suggestions are somewhat stale, though they will be found useful to many students, particularly the remarks on ward construction. We quite agree there should be a unit of size for all workhouses, asylums, schools, and barracks, which may be increased according to requirements. Conditions affecting materials in construction, such as the loss of heat through walls of different kinds and construction, form an important chapter into which we cannot enter. The purity of water, refuse removal, house-drains, sewerage works, &c., are the subjects of the concluding chapters of Capt. Galton's useful *résumé*.

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THE REPORT OF THE METROPOLITAN BOARD OF WORKS ON THE RECENT GAS EXPLOSION.

At the meeting of the Metropolitan Board of Works, on Friday last, the Works and General Purposes Committee brought up a voluminous joint report by the engineer and the consulting chemist on the subject of the recent gas explosion in the neighbourhood of Tottenham Court-road. The report commences by describing the works as laid down by the Gas Light and Coke Company and the number of explosions that took place at different points, and then goes on to say:—

"The circumstances which seem most worthy of note in connection with this explosion are—First, as to the means by which the gas found its way into the new main, from which it was supposed to be cut off by a sound and efficient valve; secondly, as to the way in which seven successive explosions occurred with an interval of time between them respectively. With regard to the first point, two theories were raised to account for the presence of sufficient gas in the new main to produce the explosive mixture of air and gas. One of these supposed the gas to have entered the main by leakage from without; the other that the gas entered at the Howland-street end of the new main in consequence of a defect in the valve, which was situated at that point. There seems very little probability that the gas could have entered the new main by leakage from without, and no reason seems to have been given to support that view. In our opinion there can be very little doubt that the gas found its way into the new main through the valve at Howland-street, which might by some means have been slightly injured; in that case a leakage of no great amount would be sufficient to admit enough gas to account for the mischief. The cubical contents of the whole main involved in the explosion were between 14,000ft. and 15,000ft., and as it is obvious, from the circumstances that explosions occurred only in certain points in the course of the main, that the whole of the contents were not explosive, probably less than 2,000 cubic feet of gas were in the main in more or less complete admixture with the air, and it would not require a great leak in the valve for 2,000ft. of gas to pass in the course of the time during which the new main had remained unused after its completion. The coroner's jury took the view that the gas had entered the new main in consequence of some defect in the valve at the Howland-street junction, and this appears to us to be the correct view. Unfortunately, the valve and its fittings were entirely destroyed by the last explosion, so that there were no means of making any investigation concerning the previous state of the valve; but all the circumstances of the case seem to point to the valve as the origin of the mischief, whereas there seems to be nothing to support the theory that gas found its way into the new main by leakage inwards, such gas having previously leaked out of other mains in the vicinity of the new main. If it be admitted, as most probable, that the gas passed by the valve from the fully-charged main in Howland-street into the new main in Charlotte-street, the formation of an explosive or inflammable mixture of gas and air was a necessary concomitant; whether such mixture would be explosive or merely inflammable was only a question of proportion between the gas and air and the completeness of the admixture or diffusion of the gas; if the gas were in less proportion than about 7 per cent. by volume, or more than 25 per cent., it would burn away quietly and not explode; but if it were in the proportion of something between 7 and 25 per cent. the mixture would be more or less violently explosive. With respect to the second point for consideration it is very interesting to observe that a number of distinct explosions took place in regular order and with a clear interval of time between them. It seems, at the first view of the matter, remarkable that this should have been the case, as it might have been expected that the gas would have diffused itself into the air contained in the main during the considerable time that had elapsed after the main was finished up to the plugged end, and that a uniform mixture would have been formed either simply inflammable or explosive in its nature. If the mixture were explosive, then it might have been expected that one general explosion of the whole of the contents of the main would have taken place at one moment, the iron pipe probably giving way in any spot in which it was weakest, or in which the pressure of the earth above and about it happened to be least. This, however, was not the case. When the light was applied to the top of the stand-pipe in the end of the main at Bailey-street an immediate explosion followed, the effect of which extended only to that particular spot; after an appreciable time had elapsed a second explosion occurred in the course of the pipe, then another, and so on, up to seven, the distances between the points of explosion varying from 180ft. to 880ft. With the exception of the fourth explosion, at the corner of Charlotte-street and Percy-street, the points of disruption were in the straight run of pipe, and the effect was exactly as if a mine of gunpowder had been laid at each point where the explosion occurred. If such mines had been connected by a match they would have exploded in succession, as the match burned away, exactly as the gaseous mixture exploded in the main. It is not easy to understand why the mixture of gas and air should have been formed in such different proportions in the different parts of the pipe that in some places the mixture should be explosive, in other places only inflammable. It has been suggested that the mixture was uniformly explosive throughout the whole length of the main, but that the disruption or bursting of the main only occurred in certain comparative weak places; this view, does not, however, bear examination. If the mixture of gas and air had been uniformly explosive it can only be believed that the explosion would have been momentarily from one end of the pipe to the other, and that the bursting of the pipe in the seven different points would have been almost or quite simultaneous. This, however, was not the case. Testimony shows that the seven explosions followed each other with a distinct interval of time between them, just as would be the case if an explosive mixture of gas and air had existed at the seven points of disruption, and a simply inflammable mixture along the pipe between those points, such inflammable mixture only serving as a means of carrying the fire from one collection of explosive mixture to the other, and the time which elapsed between each explosion being consumed in the progress of the flame along the pipe. Flame does not travel with very great rapidity under such circumstances, and the interval between the explosions would be thus fully accounted for. After all, the most important question now is as to the practical lesson to be learned from this accident. It is obvious that considerable danger may exist in connection with the practice of testing gas-mains before they are brought finally into use, and that when the mains are of the large size now generally laid down, and where the cubical contents are consequently great, the danger may be very considerable, as has been shown in the case now under consideration. In the first place, the application of a light to test the unknown contents of a main which is in connection with another main charged with gas, is an act which seems to us to border on temerity; it is quite impossible to know that leakage from a charged main into a new main may not take place at any time; under such circumstances the formation of an explosive mixture is only a question of degree, and to suppose that fire will not travel down a pipe, even of small diameter, is a very dangerous error. In the second place, the danger of applying a light may be entirely avoided. The Davy lamp affords an illustration that flame may be applied to test a gaseous mixture provided that proper arrangements be made to prevent the direct contact of the flame with the inflammable explosive mass. If on the top of the standpipe screwed into the main at the blank end in Bailey-street there had been applied a contrivance analogous in principle to that of the Davy lamp, or like what was known as Maughan's jet in connection with the oxy-hydrogen blowpipe, no danger in applying a light would have existed, and no accident would have occurred. It is desirable that the attention of gas companies should be directed to this point; to apply a naked light to the top of a stand-pipe connected with a main in the manner in question was a most dangerous act, and such a thing ought never to be repeated without precautions quite easy of appliance, and which would be effective in obviating danger."

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BRIDGE - BUILDING AND AMERICAN ENGINEERS.

In the course of his annual address delivered at the Annual Convention of the American Society of Civil Engineers at St. Louis, on May 25, the Vice-President, Mr. O. Chanute, made the following remarks on the progress of Bridge-building in America:—

While it is true that bridges were built centuries before engineering was recognised as a distinct profession, it is true equally that engineers, admittedly to-day, are the bridge-builders of the world. Our predecessors of earlier days worked in wood and stone, and their rules of construction were founded upon the cut and dry method. We have now added iron and steel as constructive materials, and it becomes a part of our duty to determine upon scientific principles the proper distribution of strains, and the due proportioning of materials to resist them, so as to secure the greatest amount of efficiency at the least cost.

As a temporary expedient, wooden bridges were early built in this country, under the familiar names of the Burr truss and the Town lattice, but after the introduction of railroads, it became necessary to provide a more efficient system of counter-bracing than could be attained in the earlier forms of trussing. The Howe truss was invented, and was found to be the simplest and best arrangement that could be adopted. This bridge is undoubtedly the best of its kind in the world, and has been of immense service in facilitating the development of our railway system through what may be called its pioneer stage. From data obtained in the railroad reports of the States of Pennsylvania and Ohio, it is estimated that there are now in the United States about 900 miles of bridges upon our railroads, of which, perhaps, one-third are permanent structures, of stone and iron, and two-thirds at least are temporary structures of wood, which will have to be rebuilt by our engineers.

The demand for more permanent structures has brought about the substitution of iron for wood. As might have been expected, the forms of trussing, with which we were most familiar in wood, were the first upon which experiments were made in iron; while, however, our English brethren 30 years ago were building plate girders and tubes, our venerable honorary member, Squire Whipple, was studying the subject, and with characteristic modesty, laying down the principles of a science of bridge-construction based upon determining the action of the forces, in skeleton structures, by rigid mathematical calculation. His book, printed by his own hand in 1847, contains nearly all that is vitally important connected with the theory of fixed spans, and his bridges stand to-day as monuments to his skill, and reminders to us of the debt we owe to that distinguished engineer.

The concentration of the material into a few parts resulted in the use of the pin connection at the joints, in contradistinction to the rivet, as used in other countries. For compression members, cast iron very readily adapted itself to top chords and posts, and until late years, was considered satisfactory. To resist tension, it became necessary to forge bars with enlarged heads, now known as eye-bars, and to determine the proper proportion of pin and eye, to the section of the bar, so as to develop its full strength. In this we have been reasonably successful, and with the introduction of improved machinery, we have been enabled to make and secure uniformly reliable bars at a very low cost. To this fact, perhaps, more than any other may we attribute the success which has attended the labours of American bridge-builders. The eye-bar is the distinctive feature of the pin-connected bridge, and upon it depends in a large measure its economy. A bridge which can be taken upon the staging in pieces and made self-sustaining, between daylight and dark, would seem to need little more to be said in its favour, as compared with the tedious and expensive methods rendered necessary in the erection of riveted structures. It must not be assumed, however, that American bridges are all pin-connected. Many of the best railroads in the country prefer riveted bridges on account of their superior rigidity, particularly in short spans, and from the fact that they are not easily knocked down by derailed cars, a point which has not received that attention which it deserves. Our shop practice in riveted work is generally good, and we have effected some improvements on the European methods, in general design; but we are yet deficient in experimental knowledge as to the value of the rivet connections, particularly when applied on one side of an angle bar, and we have not yet been able to avoid cross strains upon the chords, at the intersection of the diagonals.

The English practice of drilling all holes on the ground where splices occur, has not been found necessary here, when a proper system of automatic spacing is employed.

The chief defects in our bridges have arisen from the weakness of the floor, and when it is remembered that locomotives have increased in weight within the past few years about forty per cent., and that the floor is subjected to its maximum strain every time that a locomotive passes over the bridge, it will be apparent that a decided increase in strength must be given to this portion of the structure, and in all probability, it will be necessary to renew many of our earlier bridges in this particular. Again, there should be more efficient provision against disaster from the derailment of cars. The less wood we have on iron bridges the better; ties are, of course, a necessity, but they should be supported on at least four iron stringers, and be spaced 8in. to 10in. apart, and secured against spreading. Joint boxes should be avoided. End posts should be continuous to the masonry supports, and secured to the top chords, and to each other by efficient portals. Horizontal bracings, to resist vibrations and wind pressure, should be made more effective than they are, particularly at the chord connections. There are many other minor details, it is safe to assume, which will be perfected in due time, but upon the broad question of experimental information, we must look for aid to every member of the profession. A testing machine of the very best description, belonging to the United States Government, is now in working order, at the service of all such as may desire to avail themselves of it. I believe the time has arrived when a committee of this Society should be appointed for the purpose of inviting the co-operation of manufacturers, in the effort to obtain more accurate knowledge of the metals and manufactured shapes which enter into our important structures. Particularly is this the case in regard to the material which we call steel. Of late, the manufacture of steel by the pneumatic and open hearth processes has been undergoing a prodigious development, and we may now assume that a metal can be obtained by either of these methods, more uniform in its character than the best iron yet offered in merchantable quantities, possessing an elastic limit of 40,000 pounds per square inch, and an ultimate strength of 65 to 70 thousand pounds per square inch, and capable of being manufactured into any of the required shapes for structural purposes, at a cost which, taken in connection with the saving involved in dead weight, must insure its substitution for iron in the larger spans at least; and it is confidently asserted by those whose experience entitles them to speak with authority, that the day is not far distant when steel will be produced at a less cost than iron is at present by the hand-puddling process. All the more important, therefore, is it that we should inform ourselves by the most thorough tests of the characteristics of steel, if we would maintain the high standard of American bridge-construction. We have thus far applied this metal to but few structures. It has been used in the bridge at St. Louis, in the bridge at Glasgow, and is now being used in the East River Bridge, designed by Mr. Roebling, of 1,600ft. span, and in parts of the Plattsmouth Bridge, which you are invited to visit. It is hoped that the engineers of these pioneer structures will communicate to the Society the information which their experiments have elicited concerning this material of the future.

The day cannot now be far distant when the merits and economy of the American type of bridges will be recognised by other nations. Already, notwithstanding the fact that labour and materials are cheaper in other countries than in this, we are enabled to compete successfully in Canada and in South America. I believe that a well directed effort to make known abroad what we have accomplished in this branch of engineering during the last fifteen years, would open a market for our bridges and designs in Europe and in Asia.

SURVEYORS' EXAMINATIONS.

WE published last week, p. 120, the scheme of examinations established by the Institution of Surveyors, by which it will be seen the programme of the Institute of British Architects was not commenced a day too soon. It has long been the custom to look upon the surveyor as a particularly useful, though somewhat intermeddling and officious, member of the building profession, at least among a certain section of architects who affect to despise the more prosaic and arithmetical duties of the surveyor. By some he is looked upon as the real enemy to the architect, inasmuch as he can prepare plans and specifications for any class of buildings in a more economical manner, and occasionally comes in for a large share of estate building. In all but art qualifications a surveyor is practically an architect, and it is the absence of the element of taste that has been so magnified as the separating-line between the two professions. It is this element in the case, moreover, which has operated so prejudicially against the establishment of an architects' examination; but with the surveyor all is dry fact and law, and there is nothing whatever to prevent an examination from becoming a test of the student's capacity.

The division proposed under Classes I. and II. seems to be a good one, as it will compel every student desirous of entering the Institution to become a fairly-educated young man in the essentials of knowledge; while Class II. will make it necessary for every student elected (after the 31st July, 1880) in future to undergo an examination in one or other of the usual branches of a surveyor's practice with which he may be conversant. That is to say, he may elect to be examined under any one of three sub-classes of a table which has been laid down to embrace the professional acquirements of a surveyor, so that in most cases it will not be necessary for the student to go through a system of cramming at all, but only to furbish up his knowledge acquired incidentally in the office in some one branch. Thus the student has three branches from which he can choose: there is land agency, valuation, and building, and these three form sub-classes. As some of our younger readers may like to know what each of these sub-classes contain, we may give the subjects in each. In land-agency they are book-keeping, the use of valuation tables, land-surveying and levelling, law of landlord and tenant, agriculture, construction of farm-buildings, forestry, land drainage, geology, and composition of soils. In sub-class II., the compulsory subjects comprise, besides the first four in the last, the enfranchisement of copyholds, law of fixtures, dilapidations, agricultural law, law of casements and riparian rights; and in sub-class III., relating to building, the following: modes of pricing work, estimation of quantities, and measurement of artificer's work, constructive and working drawings, and the law of fixtures, of dilapidations, of easements, and light and air, in addition to the three first subjects in sub-class I. In addition to these, a report on some special subject named by the council, will be required of students passing in sub-classes II. and III., and a knowledge of some special science, as algebra, hydrostatics, metallurgy, mechanics, road-making, &c., a list of which is given in the code of rules. By this division into sub-classes, the student is limited to that branch of his profession which he likes the best or which he has studied, so that really little more is required of him than getting up those subjects in which he may feel himself rather backward. As regards the laws of fixtures and dilapidations, casements, &c., the elements only are necessary to be learned—a task that might be accomplished in the course of a few days' diligent reading. A building surveyor, unless he is chiefly engaged in quantity taking, often has to prepare valuations and land surveys, particularly in the provinces, so it is necessary that he should be acquainted with the elements of the valuation of freeholds, leaseholds, and the law of landlord and tenant. We do not see in the last sub-class any mention of the preparation of a specification—a most necessary accomplishment for the building surveyor, which might be added to or substituted for one of the last subjects. It will be noticed that book-keeping, the use of valuation tables, and land-surveying are required in all three classes, and these are doubtless the A B C of a successful surveyor's practice. The legal and miscellaneous subjects are at present picked up in practice, hence the very different and conflicting views held by surveyors on some of these topics, and the diversity of practice found to exist. The Council have selected their subjects with judgment, but the student would be greatly aided if a list of books were added, acknowledged as authorities in the subjects mentioned.

THE OUTER COLOURING OF HOUSES.

IT is easier, writes Mr. Meynell, in the *Magazine of Art*, to decide what is not, than what is, a fitting hue for the painting of London houses. A glance at what has already been done helps us as to what we should avoid. So far as we have observed, no kind of blue has been attempted; and this is well. We also dismiss the heavy dark grey which has been used in several instances on both sides of the park, as a needless addition to the burden of existence in an age which asks itself whether life is worth living, for this colour is intolerably dismal. We must also condemn for the same reason the black which has been tried in the neighbourhood of Brompton; neither is the red of Herbert House, Belgrave-square, so largely imitated, precisely felicitous in effect. And yet it is to red that we must turn for the principal solution of our difficulty. How happy is the effect of the red-brick houses which are springing up in all directions, and promise to be soon numerous enough to leaven the mass of London mud-colour, all who have an artistic sense must feel. They warm up the very chills of a November sky, they form strong but pleasant contrast with the trees in summer, and combine really well with the greys and browns of winter boughs, pavements, and mud; there is no sky with which they can form discords; they suggest warmth and charming furniture within; and if uniform paint could give the same effect as the dull broken surface of brick, we should recommend that houses which are unfortunate enough to be dependent upon paint, should imitate the tint, though, of course, not the appearance, of honest red brick The colour in oil-paint must, however, be lighter, duller, less positive, and more mixed—the dire necessity of constant newness and the heavy unctuousness of surface being borne in mind. In no case, and under no possible circumstances, should a house be painted red without the relief of cream-white dressings to the doors and windows. The effect of a block of London houses coloured with the right red and the right white would be as excellent as is consistent with inartistic architecture; and if the inhabitants would once for all exchange every sash-window in the block for French casements, large or small paned, and have their doors painted a good dull dark green (composed of black and white and yellow without any blue whatever), with brass appointments, they would have dwellings as good as adverse circumstances allow. Another block might be painted in a warm creamy yellow, much toned down in the mixing by means of white and grey, yet decided enough to be relieved with warm white lintels. Next, an experiment might be tried with sage-green. Why should the colour which is so pleasant to live with indoors not help to make our streets agreeable? Much taste, however, or, failing that, much docility under advice, is necessary in the choice of sage-green; for a good sage-green is at least a tertiary colour, and of course, the more compound the tint, the more room for diversities. Following our rule, we would have no cold greens; the colour should at once be warm and greyish; as in the other cases, we would not use it in one mass, but break it slightly with cream-white lintels, and the doors should decidedly be black, with brass appointments.

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OUR COMMONPLACE COLUMN.

NATURAL BED OF STONE.

It is a rule, founded upon observation and experience, that the stones used in a building should be placed so that the laminæ be in planes parallel to the horizon, and perpendicular to the face of wall. The reason of the rule is that as the connecting substance of the laminæ is of a more friable nature than the laminæ themselves, they are apt to scale off, and thus produce rapid decay. In the mechanical process of disintegration, there is much to fear from inattention to the laying of stones in their "natural bed." The freezing of water, which enters the stone through fissures or pores, and finds its way between the laminæ, is a constant source of mischief in masonry. Thus the importance of setting stones with their laminæ, or, as the workmen call it, "bed," in a horizontal direction, cannot be over-estimated. If work be "face-bedded," the water freezing causes the laminæ to scale off in succession, so that in course of time the space the stone occupied is left vacant, and farther damage by the intrusion of moisture is caused. The natural bed of a stone should particularly be attended to in the fronts of buildings facing the south and west. Under the present contract system of inviting builders, it is almost impossible to exercise the amount of care necessary to have all stones laid on their proper bed, and architects often neglect to provide a due supervision, even when they can do so. In the specification for masonry the architect should always insert a clause to the effect that the stones are to be properly marked by the stone-merchant, and to be laid on their natural bed. It is not unusual for the upper bed of stone to be so marked at the quarry, but the precaution is next to useless under the ordinary supervision of buildings. We may observe, for the guidance of the young architect, that sandstones are particularly liable to decay, or the scaling of their surfaces; there are generally laminated plates of mica intervening between the beds. Limestones are less liable, though varieties occur, such as in shelly limestones, where the planes of lamination are visible. In the report of the Commission appointed to select a stone for the Houses of Parliament some valuable observations are made. We quote those paragraphs bearing upon the "bedding" of stones. "Sandstones, from the mode of their formation, are very frequently laminated, more especially when micaceous, the plates of mica being generally deposited in planes parallel to their beds. Hence, if such stone be placed in buildings with the planes of lamination in a vertical position, it will decompose in flakes, according to the thickness of the laminæ; whereas if it be placed so that the planes of lamination be horizontal, that is most commonly upon its natural bed, the amount of decomposition will be comparatively immaterial. Limestones, such at least as are usually employed for building purposes, are not liable to the kind of lamination observable in sandstones; nevertheless varieties exist, especially those commonly termed shelly, which have a coarse laminated structure, generally parallel to the planes of their beds, and therefore the same precaution in placing such stone in buildings so that the planes of lamination be horizontal is as necessary as with the sandstones above noticed."

NAVE.

The nave is the body of a church extending from the west entrance to the transepts, or to the choir or chancel, if there are no transepts. It usually has aisles, one on each side, though in the naves of some churches, such as those in the South of France, of Aquitania and Anjou, for example, there are no aisles, but the naves are exposed on both sides, and are covered with domical roofs. The width and proportions of naves is a study of more value to the architect than has been generally thought. In France the naves of churches gradually assumed a majestic width of from 50ft. or upwards, and in churches of only one nave, as the Cathedral at Toulouse, the width between the walls was 63ft. The width of English naves is generally less; a large proportion of old churches says the "Arch. Dict," will be found to be under 30ft. between the centres of the piers; the modern ones about 25ft.; Lichfield is about 33ft.; Hereford, 38ft.; Chichester, 37ft.; York, 48ft.; Westminster, 38ft. 6in.; Ely, 30ft; Old St. Paul's, 39ft. In Germany, Ulm Cathedral is 56ft. wide, over treble in height; Spires Cathedral is 51ft., over double; and Trèves Cathedral has a nave of 60ft. In Italy, Milan is 63ft. between centres of columns; Florence, 60ft.; Sta. Chiara, Naples, is 104ft. wide, and has no aisles. Spain has many wide naves. Gerona Cathedral has one 73ft.; Palma Church, 95ft. Many modern churches have been built with wide naves and narrow aisles. Mr. Street built a church at Clifton upon this plan, and several recent churches by that architect, by Mr. Pearson, Mr. Hansom, Mr. Blomfield, Mr. J. Fowler, and others, exhibit a greater width of nave than was formerly thought judicious. The advantage of a wide preaching area is beginning to be felt, and architects now frequently reduce the width of their aisles for the purpose, thus throwing all the central area open for seats, the aisles serving merely as passages. For other particulars of naves, see art. in "Architectural Dict." and a paper on the subject of wide bays in Building News, XVIII., 1870, p. 352. The proportion of the height to the width of naves varies much; in town churches it seems desirable, for more than one reason, to make the nave lofty chiefly because it enables the architect to introduce lofty clerestory windows, by which means he can dispense with or reduce the aisle windows. But the beauty inherent in a well-proportioned nave is a point that should not be overlooked. The nave of Amiens Cathedral is three squares in height, and it has been shown by Mr. E. Cresy in Gwilt's "Encycl." that the entire nave of Amiens may be placed within an isometrical cube. Each side of the cube is divided into 36 squares, each of these is 23ft. 6in. on each of its sides. The walls and buttresses occupy the outer six squares of this division, the adjoining inner squares occupy the space of the aisles, and the two middle divisions the nave. The nave occupies thus 12 squares, and the aisles the same. The same author shows also that Amiens and Salisbury Cathedrals were both set out with the perch measure of the respective countries. The squares set out as above each measure 23ft. 6in., the royal French perch. The development of the nave from Romanesque examples is interesting. In the earlier Norman churches the triple division into arcade, triforium, and clerestory was defined by string-courses, and each horizontal division was treated more or less distinctly; as the style advanced, these horizontal lines were broken through, the pier-shafts run up to carry the vault and divide the three parts into compartments, till, in the Perpendicular, the vertical lines appear more prominently, and the bay becomes a more decided vertical compartment from the floor to the vaulting. We refer the reader to Viollet-le-Duc's Dictionary (see arts. "Architecture," "Cathédrale," "Nef"); see also Walcott's "Sacred Archæology" for elaborate notices of the subject.

NECKING.

Necking is usually applied to the upper portion of a column, or the space between the lower annulet and its junction with the shaft. In the Parthenon the junction is a slight groove; in other instances of Doric it consists of two or three grooves; these are often chamfered or sloped on one or both sides. The Greek Ionic has rarely a necking. In the Roman orders the necking became an astragal, and is generally part of the capital, though the real neck is the space between the astragal and cap, and both these are often of different marble to the shaft. In Gothic the neck-moulding separates the capital from the shaft.

BUILDERS' BENEVOLENT INSTITUTION.

The thirty-third annual meeting of this Institution was held at Willis's Rooms, St. James's, on Thursday, the 29th ult., the President, Mr. F. J. Dove, in the chair.

The report for the past year stated that if means should be found to make an addition to the annuities now given (£30 to men, and £24 to women), the comfort of the pensioners (many of whom had no other means whatever) would be materially promoted. The Committee had confidence that increased funds would be supplied by the powerful interest which the Institution represented, if it were decided to increase the pensions. The Committee express their thanks to Mr. F. W. Keeble, the hon. secretary of the annual ball, and to the stewards who assisted him, in making that gathering a success, and warmly acknowledge their indebtedness to Mr. F. J. Dove, the retiring President, for the energetic manner in which he has served the Institution during the past year. During the year ten pensioners (an exceptionally large number) have been elected on the funds of the Institution, and two widows of pensioners have been added to the list without election. Seven pensioners died during the year.

The balance-sheet, audited by Messrs. J. H. Hunter, J. Cruttenden, and R. J. Ward, showed the receipts to be £3,221 19s. 2d. (including £846 10s. 7d. balance brought forward from last year). The annual subscriptions amounted to £786 10s.; the donations to £861 12s.; the dividends on funded property to £632 7s. 5d.; and the profit on the ball was £94 19s. 2d. The expenditure included £1,346 6s. 6d. paid to pensioners; and the burial-money for pensioners, £35 1s. 6d. After deducting expenses of management, and expending £700 in the purchase of Three Per Cent. Consols, there remained a balance of £788 1s. 4d. at the bankers'.

On the motion of Mr. George Plucknett, seconded by Mr. Richard Head, it was resolved, after considerable discussion, to increase the pensions of the men to £39 a year, and those of the women to £27 a year. It was stated that there were now twenty-two men and thirty-one women receiving annuities from the Institution, and that the Committee hoped in a few years' time to increase the amount of the pensions to £50 per annum for the men, and £30 per annum for the women. To enable them to do this, increased subscriptions would be needed.

It was resolved to alter section 2 of Rule III., so as to allow applicants for pensions to be in receipt of an income of £50 per annum (independently of the amount of the pension), instead of £30 as at present.

The report and balance-sheet were adopted, and votes of thanks were accorded to the President for the efficient way in which he had performed the duties of his office during the past year; to the vice-presidents; to the trustees (Mr. George Plucknett, Sir S. Morton Peto, Alderman Sir J. C. Lawrence, M.P., and Mr. C. T. Lucas); to the Committee; to the auditors; and to the honorary solicitors.

The Treasurer (Mr. George Plucknett) was re-elected, as were the members of the Committee, who retired by rotation, and the auditors. Mr. Howard Colls was also elected a member of the Committee.

Mr. Thomas F. Rider was unanimously elected President of the Institution for the ensuing year, and it was announced that under his Presidency the annual dinner will be held at the Freemasons' Tavern on Thursday, November 11th.

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THE SPA, SCARBOROUGH.

After the fire in 1876, which destroyed the Spa Saloon, erected from the designs of the late Sir Joseph Paxton, in 1858, the Committee having obtained the advice and assistance of the late F. P. Cockerell, Hon. Sec. R.I.B.A., in drawing up the necessary conditions, invited architects to send sketch designs in competition. This was responded to by twenty-six designs being submitted, of which the authors of four were selected by Mr. Cockerell to furnish further drawings, in elucidation of their designs, and also an alternative design for the restoration and readaptation of the existing buildings. This gentleman having reported upon these finished designs, selected that sent in by Messrs. Verity and Hunt, of 27, Regent-street, London, who were thereupon instructed by the Committee to prepare the necessary working drawings and estimates. The work of rebuilding commenced in October, 1877. The Grand Hall, a room capable of holding 3,000 persons, was opened to the public on the 1st June, 1879, and the whole of the buildings are now completed, and were opened on Monday. The attention of the architects was particularly given to preserving, so far as possible, the old associations of the place, and such features as the balconies and colonnade, and a portion of Paxton's Hall, were carefully retained, so that it is difficult at first sight to realise that such an entire re-construction has been effected. The old Gothic Hall, built by Wyatt, in 1837, has been entirely demolished to make way for the present buildings. After the removal of the old buildings, it was necessary to execute a most extensive system of massive retaining walls, in order to secure the Cliff in the rear of the buildings. This, owing to the nature of the ground, was a work of extreme difficulty. Some idea may be formed of the extent of these works when it is stated that nearly 30,000 tons of earth had to be removed. The foundations of all the walls have been carried down to the solid rock, and every precaution has been taken to secure the durability of the structure. The first portion of the actual building work entered upon was the Grand Hall. The site of the Grand Hall is 140ft. by 100ft., and 56ft. in height. The area of the hall is 54ft. by 64ft., and it is capable of accommodating a seated audience of about 1,000 persons.

In addition to the accommodation provided in the Grand Hall, there is on the first floor a hall 100ft. by 60ft., and 40ft. high, which was originally intended for a floral lounge; but this has now been fitted up with a small stage, and the auditory arranged so as to serve either the purposes of dramatic or musical representations. On the ground-floor immediately below this hall is a buffet, 100ft. by 30ft. A central vestibule and staircase, 50ft. by 30ft., giving access to the two halls, and to the buffet, leads likewise to a reading-room, or billiard-room, 30ft. by 30ft., with a conservatory at end. On the upper terrace, which forms the roof, and immediately over this portion of the building, is a cafe, 30ft. by 30ft., with an open loggia overlooking the sea; a separate servants' staircase, and a lift, are provided for communication with the kitchens, &c., below.

Connected with the interior of the two halls, the buffet and the cafe, are several retiring and cloak-rooms.

The total length of the building is 242ft. The general height of the whole corresponds with that of the old saloon. Additions have been made to the towers by an extra story and Mansard roof. The central block rises to a height of 75ft. above the promenade. The whole of the works have been carried out from the designs, and under the superintendence, of the architects, Messrs. Verity and Hunt; Mr. F. T. Reade, C.E., being the engineer for the structural ironwork. The general contractor was Mr. John Barry, of Scarborough. Messrs. Dennett and Co., of Nottingham and London, have constructed the floors, terraces, and tower stairs in their patent concrete. The tile-work is by Messrs. Simpson and Sons, London. The ornamental plaster-work is in Geo. Jackson and Sons' patent fibrous material. The stone-carving has been done by Mr. Seale, of Walworth. Mr. H. N. Taylor has acted throughout as clerk of works.

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MR. RUSKIN ON GLOVES AND PICTURES FOR MUSEUMS.

MR. RUSKIN, in the *Art Journal* this month, writes on "Museums." In introducing his subject, he has the following reference to the difficulty in getting good leathern gloves:—

"I can't give you any talk on detail yet; but, not to drop a stitch in my story, I want to say why I've attached so much importance to needlework, and put it in the opening court of the six. You see they are progressive, so that I don't quite put needlework on a level with painting. But a nation that would learn to 'touch' must primarily know how to stitch. I am always busy for a good part of a day in my wood, and wear out my leathern gloves fast; after once I can't wear them at all; but that's the precise difficulty of the matter. I get them from the shop, looking as stout and trim as you please, and half-an-hour after I've got to work they split up the fingers and thumbs like ripe horse-chesnut shells, and I find myself with five dangling rags round my wrist, a rotten white thread draggling after me through the wood, or tickling my nose, as if Ariadne and Arachne had lost their wits together. I go home, invoking the universe against sewing-machines, and beg the charity of a sound stitch or two from any of the maids who know their woman's art; and thenceforward the life of the glove proper begins. Now, it is not possible for any people that put up with this sort of thing to learn to paint, or do anything with their fingers decently; only, for the most part they don't think their museums are meant to show them how to do anything decently, but rather how to be idle, indecently. Which extremely popular and extremely erroneous persuasion, if you please, we must get out of our way before going further."

After this Mr. Ruskin, who some time since attacked Mr. Frith's "Derby" picture in reference to the Leicester Museum, explains away his criticism:—

"I owe some apology, by the way, to Mr. Frith for the way I spoke of his picture in my letter to the Leicester Committee, not intended for publication, though I never write what I would not allow to be published, and was glad that they asked leave to print it. It was not I who instanced the picture; it had been named in the meeting of the committee as the kind of thing that people best liked, and I was obliged to say why people best liked it, namely, not for the painting, which is good and worthy their liking, but for the sight of the racecourse and its humours. And the reason that such a picture ought not to be in a museum is precisely because in a museum people ought not to fancy themselves on a racecourse. If they want to see races, let them go to races; and if rogues, to Bridewells. They come to museums to see something different to rogues and races."

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THE ART-GALLERY AND MUSEUM FOR BIRMINGHAM.

THE munificent offer of Messrs. Tangye to contribute £10,000 towards art examples for an art gallery and museum for the town of Birmingham, on the condition that the Council would provide a permanent public building for such gallery commensurate with the necessities of the town, has led to a very gratifying result. The difficulty which presented itself to the Council arose out of the circumstance that they had no legal power to defray, from any existing funds at their disposal, the cost of erecting the proposed gallery. The General Purposes Committee, to whom the matter was referred, having fully considered the subject, reported on Tuesday that, at the rear of the present council-house, there was land which, as far back as 1865, had been appropriated by the Council for assize courts and judges' lodgings, but which would form a most convenient and suitable site for an art gallery and museum, fully adequate to the requirements of the town. If the original intention of building assize courts were adhered to, the further concentration of municipal business would be suspended, if not rendered altogether impracticable, and the Committee therefore recommended that the minutes of the Council appropriating the land in question for assize courts should be rescinded. The expenses authorised by the Public Libraries Act (under which alone the Council had power to provide an art gallery and museum) were limited to the penny rate which might be levied under these Acts. But under section 18 of the Public Libraries Act, 1855, the Council might, in addition to the said rate, with the approval of the Treasury, appropriate, for the purposes of the Act, any land vested in the corporation, and on such land might erect buildings for public libraries or museums, or both; or for schools of science and art. The Committee therefore recommended that the site in question should, with the approval of the Treasury, be appropriated for the purposes of the free libraries department, on the terms that offices for the gas-department, at present located in another part of the town, should be erected at the cost of that department, as a consideration for the use of the land, and that the first floor of the building should be made available for an art gallery and museum. Under the plans of the proposed building, prepared by Mr. Yeoville Thomason, the accommodation for this purpose (on the first floor) would consist of three galleries of the following dimensions: West gallery, 71ft. by 50ft., 4,180 square feet; central gallery, 157ft. by 52ft., 8,164 square feet; and east gallery, 83ft. by 45ft., 3,825 square feet; or a total area of 16,178 square feet; while on another floor there would be an additional space of 6,332 square feet available for use. In order to assure themselves of the complete legality of the proposed scheme, the Committee had submitted a case, embodying all the facts, to the Solicitor-General and Mr. R. S. Wright, who expressed the opinion that the scheme could be legally carried out, and drafted the requisite resolutions for adoption by the Council. As the erection of the building would necessarily occupy a considerable time, the General Purposes Committee recommend the Council to authorise the Gas Committee, who, as well as the Free Libraries Committee, cordially concurred in the recommendations made, to proceed at once with the necessary levelling work, the putting-in of the foundations, and the brickwork and concrete for the latter, and that they should also empower the Gas Committee to cause the necessary plans for the buildings to be prepared, to obtain tenders for the works, and to take for these purposes such measures as they might deem necessary or advisable. The Mayor (Mr. R. Chamberlain), in moving a resolution for the adoption of the proposed scheme, and for conferring upon the Gas Committee the requisite power to proceed with the preliminary work, explained that although he had felt it necessary to consult Mr. Thomason, the architect of the existing Council House, on the subject of what could be done with the land, the present resolutions did not involve the adoption of any particular plan. The elevation in pencil before the Council was only made to show the style in which an extension of the present buildings could be effected, and a sufficiently imposing entrance to the art gallery provided. It was considered that a mean entrance might damage the popularity of the proposed institution, and lessen the chances of securing gifts from parties interested in art progress. The Mayor added that the space at disposal might be enlarged to 20,000 square feet if it were determined to erect a gallery round the principal room. The resolution was seconded by Mr. Alderman Lloyd, and carried unanimously. The preliminary work will at once be proceeded with. A memorial from the Birmingham School of Art, praying that provision should be made for the accommodation of the school in the proposed new buildings, was referred to the General Purpeses Committee, but the Mayor remarked he feared want of space would prevent the committee from reporting favourably on the application.

At a meeting held in Birmingham yesterday about £3,000 was collected towards the £5,000 required to secure the additional sum of £5,000 conditionally promised by Messrs. Tangye for contributions to the art gallery. The Mayor, who presided, and headed the subscription list with £500, said that the main gallery would be on the model of the South Kensington Museum. Subscriptions will not be limited, and are expected to reach at least £10,000.

◆

CHIPS.

The South London Tramways Company have let the contract for the construction of the tramways in Battersea to Messrs. Dixon and Horne, of Lawrence Pountney-lane, City, and the work has already been commenced. This firm's tender was not the lowest received, but was accepted because Messrs. Dixon and Horne were able to begin the contract at once.

At the Derby Police-court on Tuesday, during the hearing of a case under the Vaccination Acts, Mr. Wills, architect, appeared for the defence, but was refused a hearing by the bench on the ground that an architect had no *locus standi.*

The Bible Christian chapel at Mevagissey, Cornwall, is undergoing renovation at a cost of £300; Mr. Blamey, of Veryan, is the contractor.

The foundation-stone of a new mission church of St. Andrew was laid on Wednesday week at Four Lanes, Wendron. The building will be in the Early English style, and will consist of a nave and chancel, two vestry and north organ-chamber, under the latter being the heating chamber. The fittings will be of pitch-pine varnished; the roof of yellow deal stained and varnished; the walling will be of local stone with granite dressings. Mr. T. Goodchild, of London, is the architect, and Mr. A. Jeukin, of Hayle, the builder.

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ILLUSTRATIONS.

NEW TOWN HALL, BANK, HOTEL, AND MEMORIAL FOUNTAIN, SAFFRON WALDEN.—BOYS' HIGH SCHOOL, PLYMOUTH.—HAVEN-GREEN CHAPEL, EALING. — ST. CATHERINE'S CHAPEL, ABBOTSBURY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE MARKET SQUARE, SAFFRON WALDEN.

Gibson's Bank at Saffron Walden, which was built a year or two since from the designs of Mr. W. Eden Nesfield, architect, is shown on the left-hand side of the double-page view which we give to-day of the Market-square of that place, which same drawing includes the new town-hall, just now erected at the expense of Mr. Gibson by Mr. Edward Burgess, architect, of Bedford-row. The Rose and Crown public-house is a genuine old structure, very carefully restored by Mr. Eden Nesfield at the time the bank was built. The memorial fountain was presented some few years since by Mrs. Gibson to the town. It was exhibited at the International Exhibition, 1862, and was executed by Mr. Earp, from the designs of Mr. J. F. Bentley, architect. Our view is chiefly made from photographs taken by Mr. Bedford Lemere.

THE BOYS' HIGH SCHOOL, PLYMOUTH.

In the laying out of a scheme for the accommodation of the Plymouth High School for Boys, the governors determined to make provision for future as well as present requirements. The structure is part of a whole—a fragment in fact. The entire design comprises 15 large class-rooms, each capable of accommodating 27 boys; an assembly-hall, 40ft. by 75ft.; a library and head-master's room, 40ft. by 27ft.; spacious principal and secondary stone staircases, board-room, assistant-master's room, and pupils' day-room; commodious drill-shed, three fives-courts, and large workshops, or chemical laboratory; a residence for the head-master, a serjeant's-lodge, and a dining-hall with all necessary culinary offices. The portion now in progress contains eight class-rooms, six being to the north, and two to the south of the central front entrance; the library over the entrance-hall and the back wing containing the board-room, &c. The principal front of the building faces south-west, and consists of a central entrance projecting four feet, flanked by a two-storied façade containing 24 large mullioned and transomed windows, lighting 12 class-rooms. At the southern extremity will be the head-master's residence, extending over a carriage archway, which unites it to the main building; and at the northern end will be the assembly-hall—standing at right angles—octagonal turrets rising up at the points of junction at both ends of the front, and also at the south-west angle of the assembly hall. The hall will be on the upper floor level, and underneath will be a range of three large class-rooms, each 36ft. by 24ft. Over the spacious arch of the central entrance vestibule is a large oriel window, which will be the chief feature of the library or head-master's room (to be used *pro tem.* as an assembly-hall), and above this window will rise a gable flanked by chimney stacks, which are so designed as to play a very important part in the architectural composition. The entrance vestibule is lined with Bath stone, and has a room on either side for the secretary's office and the porter's use respectively. The hall within is 27ft. square, and spacious corridors, 9ft. wide, extend from it right and left, and are lined with arched recesses throughout the entire length, with a depth of 4ft., for cloaks, hats, &c. From the central hall swing-doors lead out to the court in the rear of the main building, on the opposite side of which—and forming the boundary up to Mutley-lane—are the drill-shed, fives-courts, laboratory, workshops, &c. At the north end of this inclosed court or play-space (205ft. long by 50ft. wide) is a covered way connecting the class-rooms corridor with the drill-shed, lavatory, and conveniences, &c. In front of the building will be a level terrace, or fore-court, conterminous in width with the length of the Assembly Hall block, and supported by a retaining-wall which the fall of the ground necessitates. The walls are faced with limestone and Portland stone throughout. The works are being executed by Messrs. Blatchford and Son, of Tavistock, under the superintendence of the architects, Messrs. Paull and Bonella, of No. 9, Montague-street, London, W.C., and No. 1, St. Peter's-square, Manchester. Mr. Siddell is clerk of the works.

HAVEN-GREEN CHAPEL, EALING.

This chapel is being built near the Ealing Broadway stations, under the auspices of the London Baptist Association. Its extreme internal dimensions are 83ft. by 51ft. Accommodation is being provided for 900 adults in the chapel (including galleries on three sides), and for 250 children in the school buildings, which include (besides the main school-room) three class-rooms and a separate Bible class-room. It was considered advisable to allow the small house adjoining to remain standing; this involved a somewhat unusual arrangement of the building, which will, however, have the effect of placing it to better advantage with respect to the roads which converge upon the site. The memorial-stones were laid on Aug. 3rd by the Rev. John Clifford, M.A., LL.B., B.Sc., Ex-president of the Association, and by Sir Thos. Chambers, Q.C., M.P., President of the Sunday School Union. The buildings are being executed in Portland cement concrete, faced externally with red bricks, with dressings of moulded brick and Bath stone. The chapel roof (the ridge of which is 65ft. above the ground) is in one span 51ft. between the walls, partly wro't, and with a groined and waggon-shaped ceiling of white deal with yellow deal ribs. The cost of the freehold site has been nearly £1,500, and the cost of the buildings is expected to be about £5,500. The works are being executed by Mr. Thos. Nye, of Ealing, from the designs and under the superintendence of the architect, Mr. J. Wallis Chapman, 11, Sutherland-gardens, Harrow-road, W.

ST. CATHERINE'S CHAPEL, ABBOTSBURY, DORSET.

We now give, supplementing the letter of our correspondent which was published in the Building News of July 2nd, illustrations of the above ancient building. Inasmuch as descriptive explanations of its different parts occur on the plates themselves, it will suffice to refer to these for particulars. Attention may, however, be specially drawn to the stone roofs; also to the upper stage of the octagonal staircase being larger than those below, and to the possible reason for this—whether it served, on occasion, for "beacon" purposes, or not?—an idea which the detached and elevated position occupied by the building would seem to favour, rather than otherwise. No use whatever is now made of the structure.

◆

The *Academy* states that the bare expenses of bringing over and erecting the obelisk known as Cleopatra's Needle did not exceed the estimate of Mr. John Dixon, the engineer, about £11,500; but to this had to be added £3,500 law costs, and net loss on the appeal to the House of Lords of £5,000, making the total cost of the obelisk £19,500, of which £10,000 was paid by Professor Erasmus Wilson.

IMPROVEMENT AND DISTRIBUTION OF SOUND BY STEEL WIRES.

It has been found that a semicircular building, lined throughout with pine-wood, is the best known structure for producing the conveyance of sound, and for the following reasons:—1st. The various return-waves of a sound come back so quickly, and almost at one and the same time, so as to combine with the original note, and render it full and rich. 2nd. The pine-wood has an affinity for absorbing the vibration of the air produced by a note, and increasing the same in a similar way to the sounding-board of a piano. 3rd. The travelling-speed of sound in pine-wood is about four times greater than in common air. This quick distribution of sound, combined with the absorption, almost entirely prevents the after-sound, so that every word spoken, or note sung, is heard distinctly.

There are not many buildings, however, that have a semicircular shape, or a pine-wood lining, and the practical difficulty has always been to overcome such enemies of sound as large stone walls, arches, domes, recesses, projecting buttresses, and many other obstacles. These are simply destructive to sound, each of them giving one or more return-waves, not coming back together as in the semicircular building, but at different times, according to distance and the various angles they have to make, causing the return-waves of sound to be often heard from four to five seconds after the note has been emitted. This greatly interferes with the following words spoken, and they, in their turn, naturally increase the confusion in the air. The audience hears but imperfectly, indistinctly, or often not at all, the speech, the sermon, or the song, which, by proper arrangement, might easily have been conveyed to them.

Hitherto no adequate cure has been found for this evil, except in a very partial degree by such contrivances as double ceilings, hangings, or drapery. Listeners have grown accustomed to hear but a few disjointed words, the thread of the discourse is often hopelessly lost, and a great deal of discomfort and loss has been inflicted on the world at large.

Mr. A. C. Engert, of 75, City-road, claims to have discovered an entirely new method of conveying sound, which is to be tried to-morrow afternoon at his premises, for the benefit of architects and others who choose to attend. In a hall constructed as above described, three causes were given for the excellence of its acoustic properties:—The semicircular form, the absorption of the vibration in the air by the pine-wood, and the velocity of sound therein. The first of these, that is the shape, is not perhaps very necessary, and need not be now regarded; but both the absorption and the velocity can be supplied artificially, and in a higher degree, as Mr. Engert claims already to have proved in his former invention of vibrating steel plates. These are so very sensitive as to take up the most gentle vibration, and render the speed of sound infinitely greater than in the pine-wood structure. In air, sound travels but 1,100ft. in a second, but in steel the speed increases to 16,000ft. in the same time. Steel plates, however, cannot be employed in all instances, but steel wires may, and are admirable for this purpose.

To properly apply the invention, one or more layers of steel wires are stretched along a building lengthwise, connected by cross-wires the spiral springs, and properly tuned, so that and vibration may be absorbed and conveyed from one to another, and instantaneously spread over the whole building. This entirely prevents any after-sound, as the naturally slow speed of sound in the air has been so accelerated that the words of a speaker, or the notes of a singer, reach the audience about fifteen times more quickly than under ordinary arrangements.

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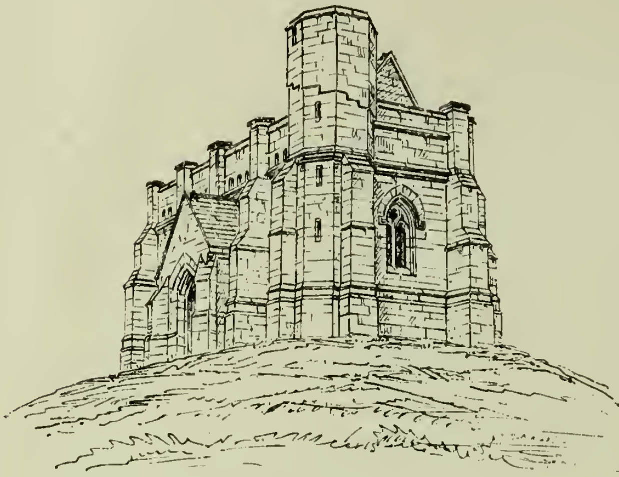
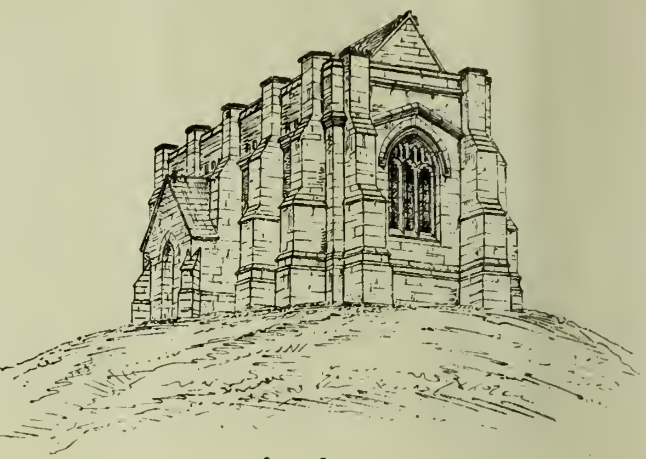
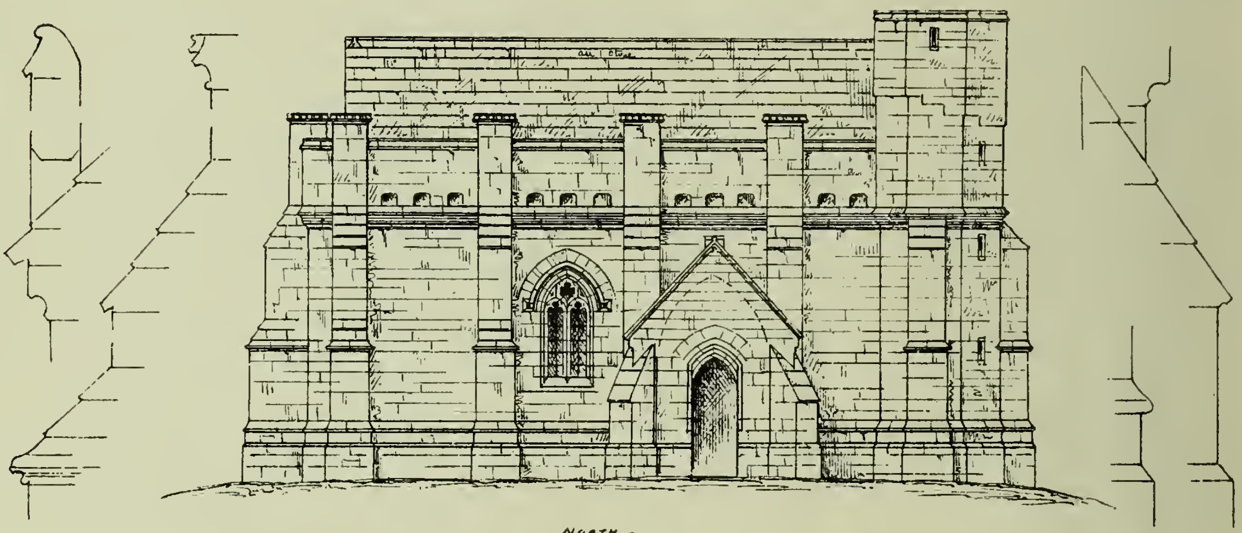
The Congregational church at St. Austell was reopened on Thursday week after renovation. The gallery is now supported by cast-iron columns in place of larger wooden ones, new open benches, Communion-platform, table, and seat, all of pitch-pine, have been erected, the organ enlarged by Mr. G. Tucker, of Plymouth, and the case decorated, and the floor of the schoolroom beneath the chapel has been lowered 18in., and a new entrance provided. Mr. S. Trevail was the architect, and Mr. Thomas J. Smith, of St. Austell, the contractor. Mr. Hawke, of the same town, did the plumbing work.



NORTH WEST –



SOUTH EAST –



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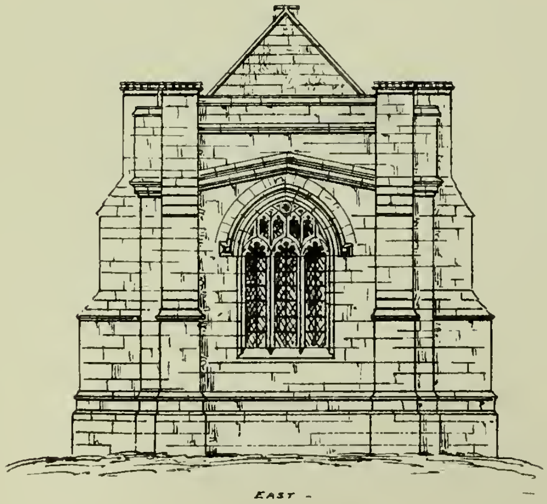
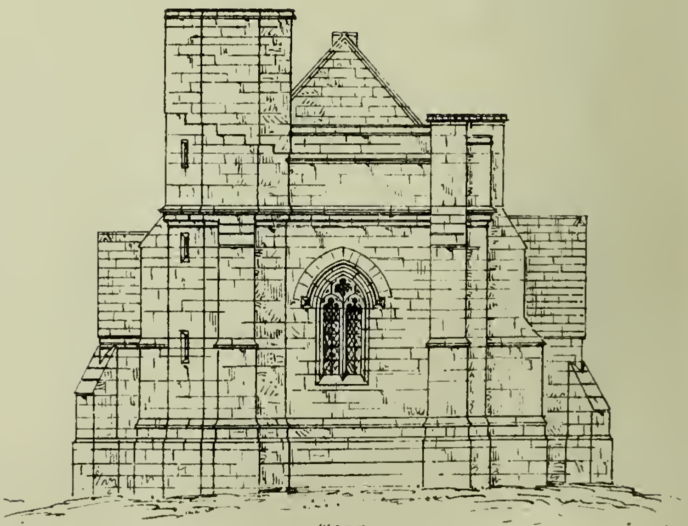


EAST –



WEST –

S: CATHERINE'S CHAPEL – ON THE HIGH GROUND OVERLOOKING THE CHANNEL –

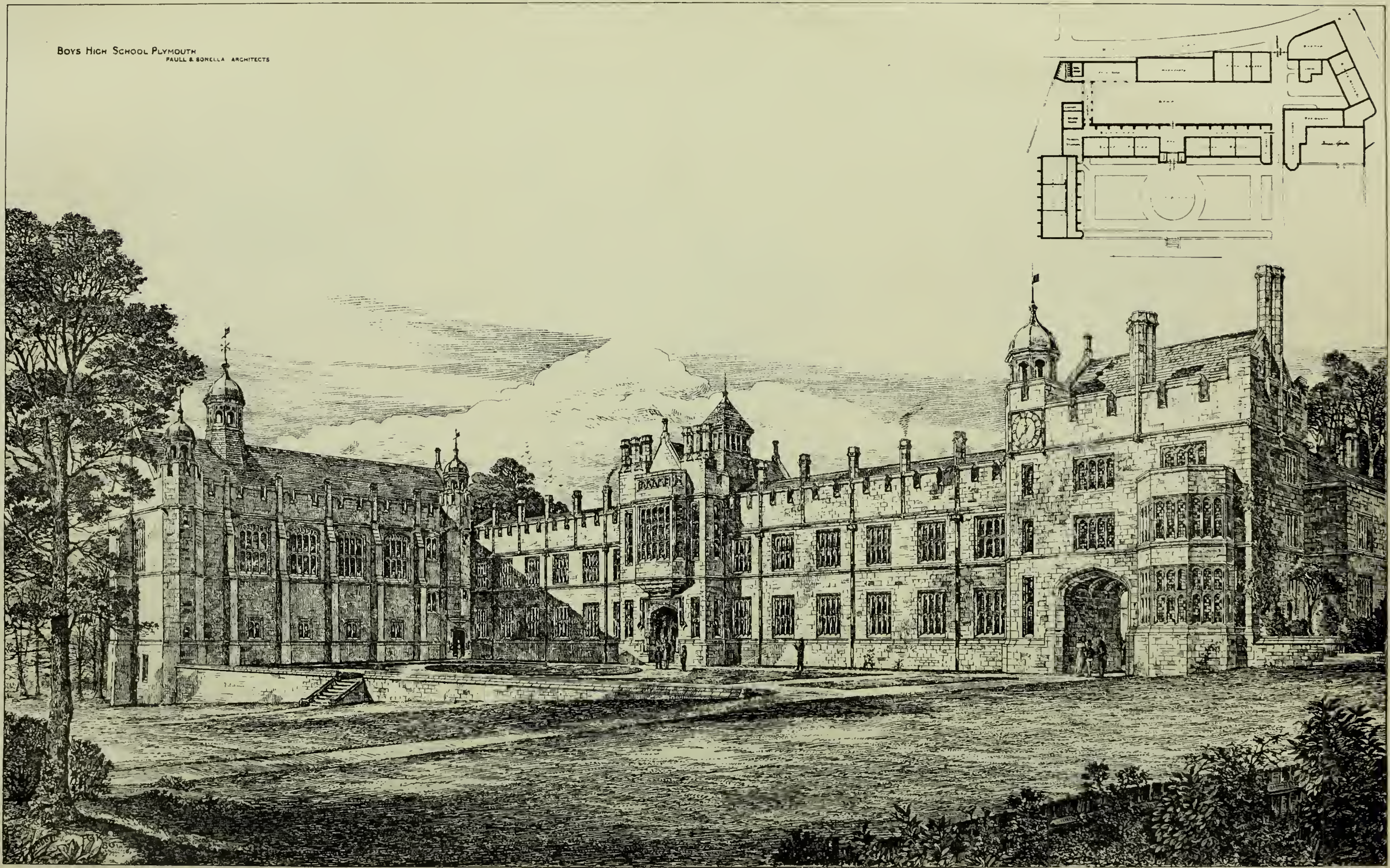
The Building is of Stone, within and without, the roofs as well as the walls.

ABBOTSBURY . DORSET – LOWER PART ROUGHLY MEASURED, UPPER PART SKETCHED –

Elevations Eighth Scale.
Details, Half inch Scale.

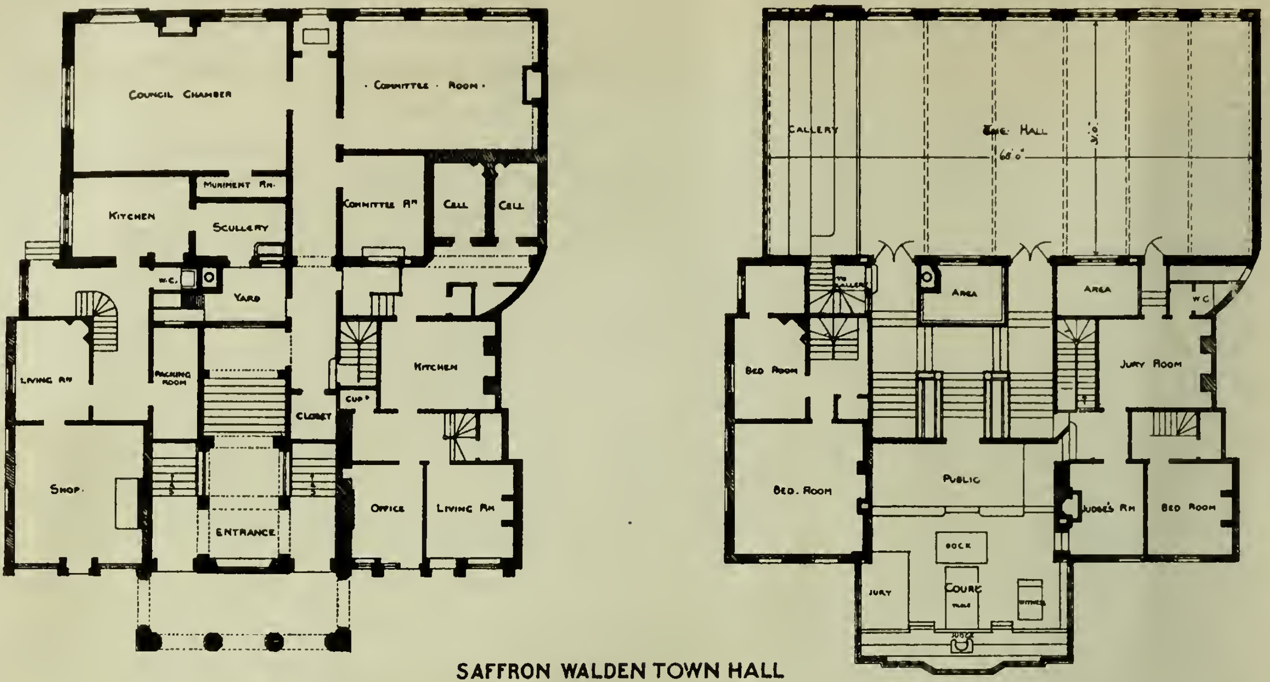
J. Drayton Wyatt, mens. et delᵗ

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W C



BOYS HIGH SCHOOL PLYMOUTH
PAULL & BONELLA ARCHITECTS

Photo-Lithographed & Printed by James Akerman, 6 Queen Square W C

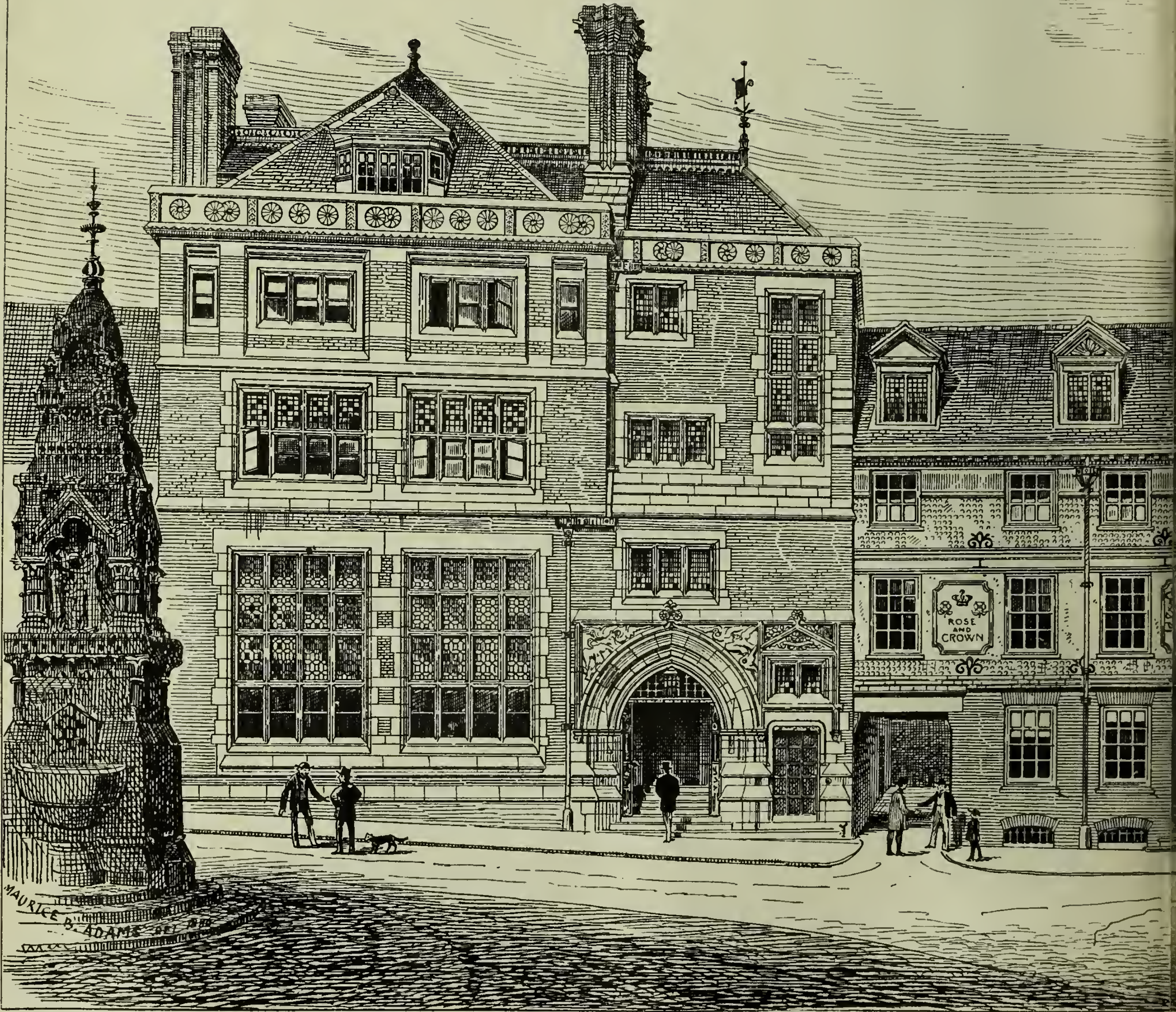


SAFFRON WALDEN TOWN HALL

SCALE OF FEET

· GROUND · FLOOR · PLAN ·

· FIRST · FLOOR · PLAN ·



THE MARKET SQUARE SAFFRON WALDEN

VIEW SHOWING THE

NEW TOWN HALL	*Edward Burgeſs* Architect
GIBSON'S BANK	*W. Eden Neſfield* Architect
"ROSE & CROWN" (RESTORATION)	*Ditto*
MEMORIAL FOUNTAIN	*J. F. Bentley* Architect

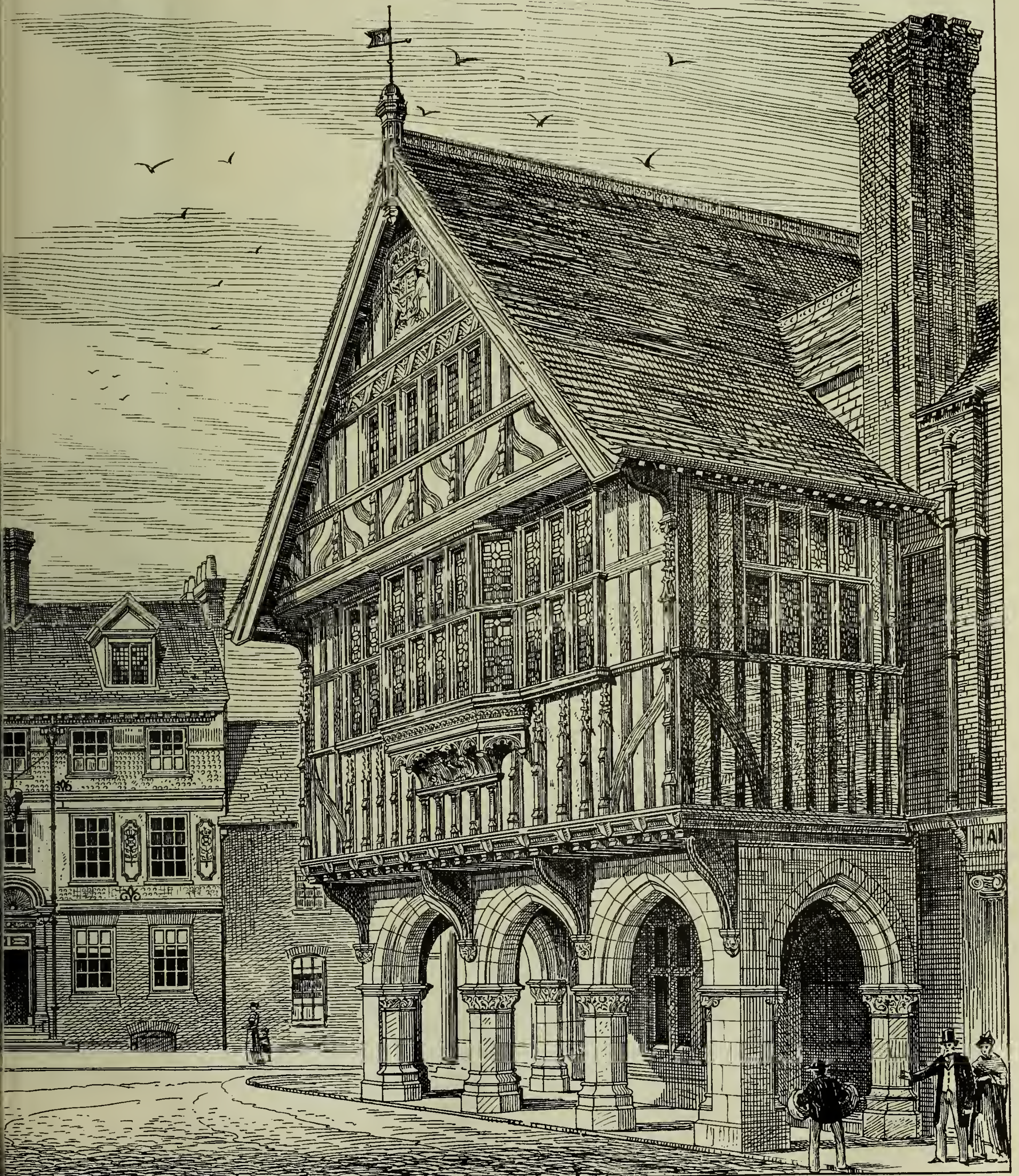
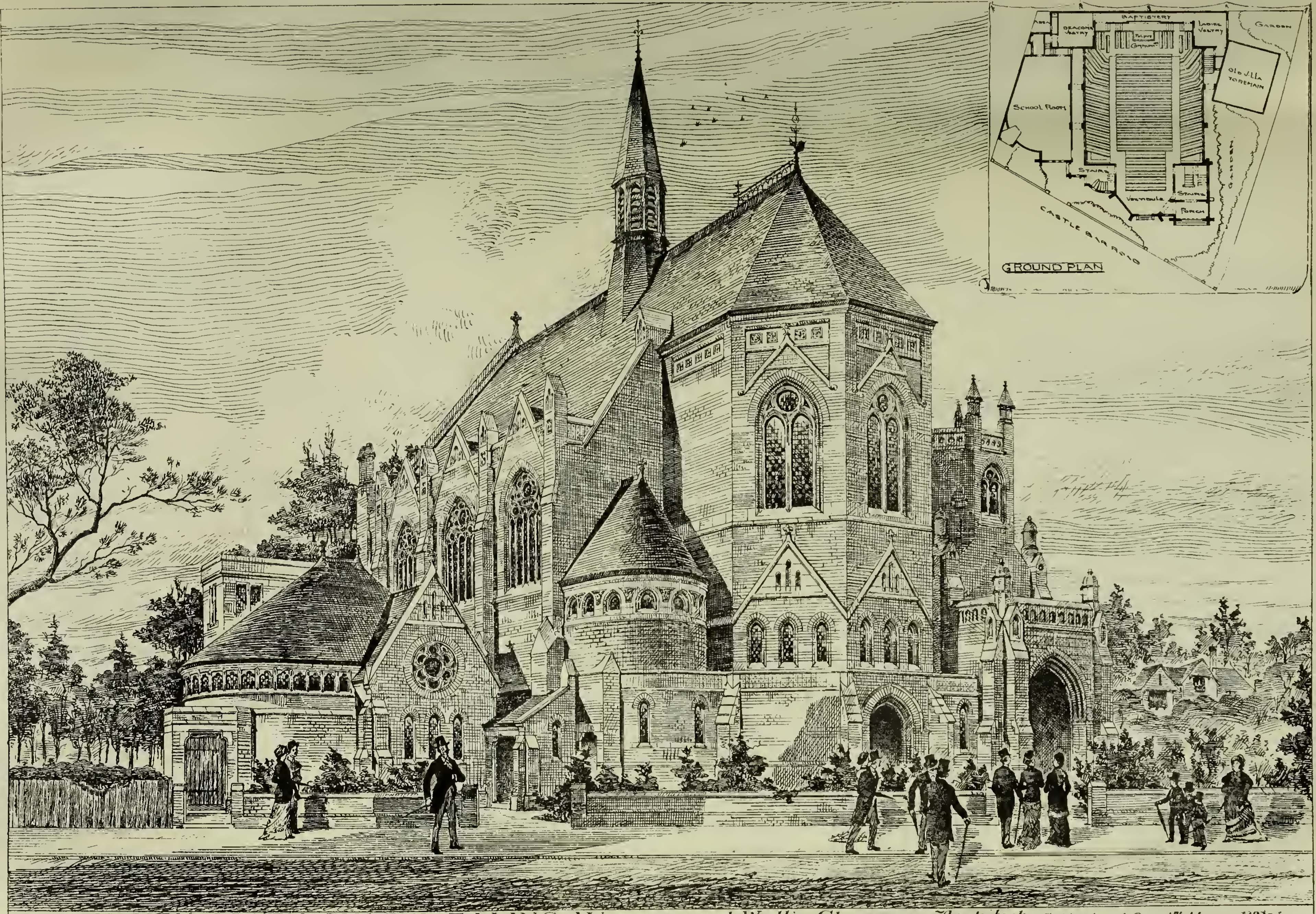
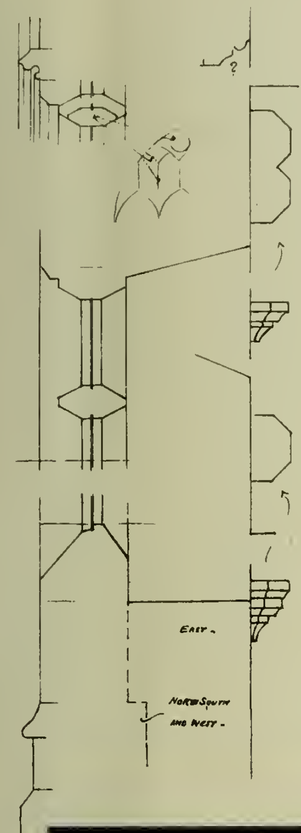


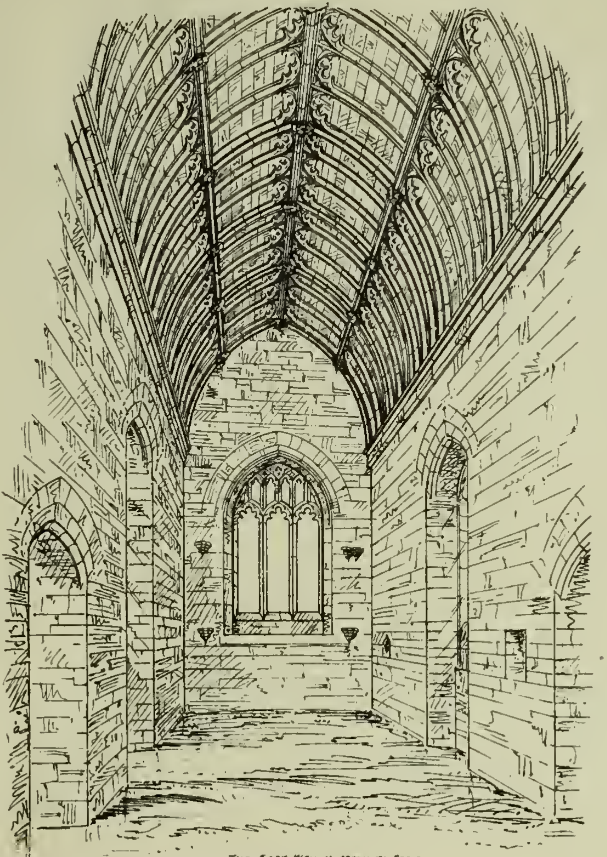
Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C



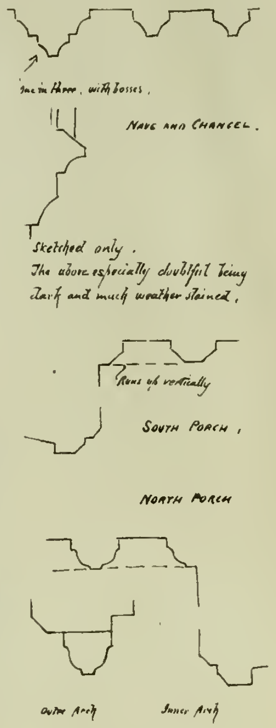
HAVEN·GREEN·CHAPEL·EALING·W —— J Wallis·Chapman Architect·11 Sutherland Gardns·Harrow Rd W.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square W.C.

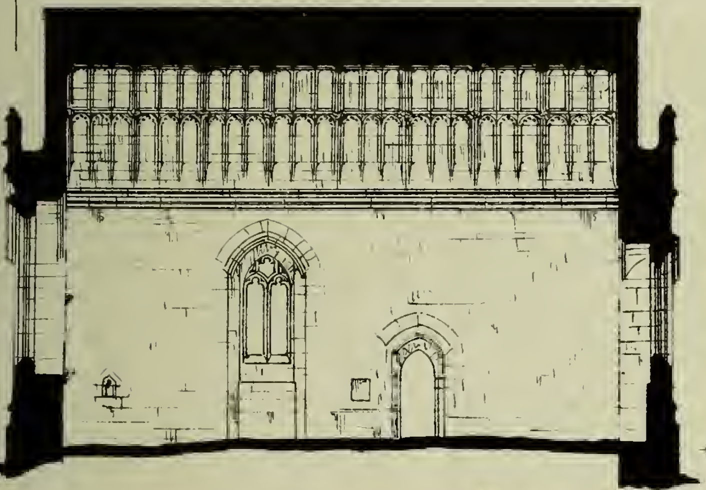


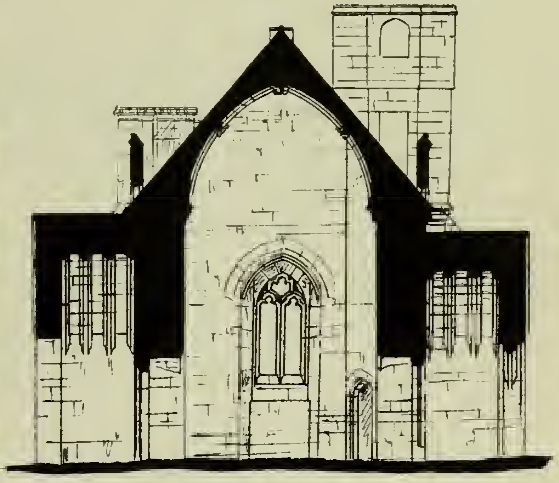


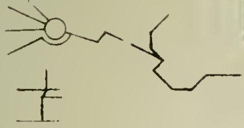
The East Wall is about to scale.

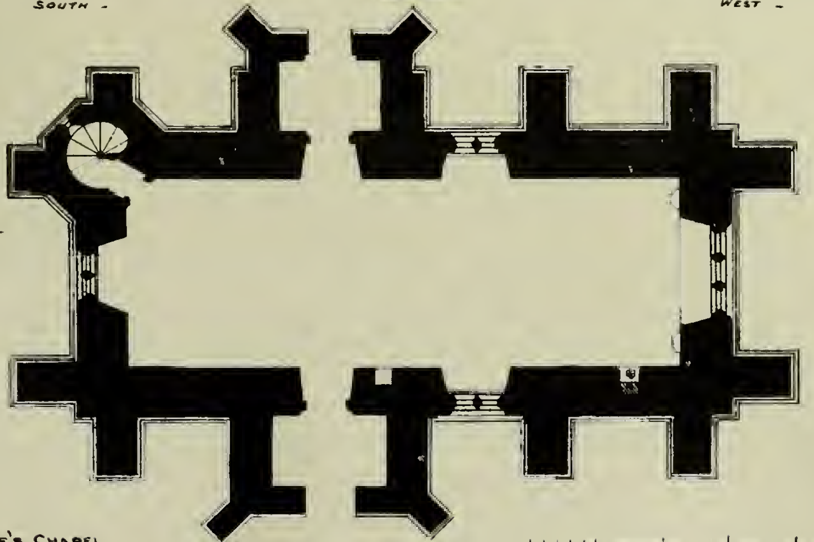


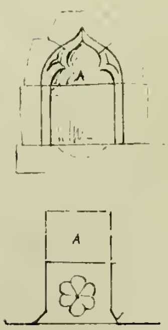
Sketched only.
The above especially doubtful being dark and much weather stained.











See Note on other drawing.
Note also that the jointing is
for the most part imaginary.
Turret enlarged above roof
perhaps only for bells, possibly
for a beacon light, or a recluse.
Inaccessible, the steps destroyed.

S: Catherine's Chapel.

Abbotsbury. Dorset.

Plan and Sections. Eighth Scale.
Details. Half Inch Scale

J. Drayton Wyatt, mens. et delt.

Photo Lithographed & Printed by James Akerman, 6 Queen Square W C

CIVIL ARCHITECTURE IN THE EIGHTEENTH CENTURY.*

THIS quaint old book contains so much practical information bearing on the present *revival* called "Queen Anne Architecture," that the reproduction of parts may be of service to some (groping in the dark) in working out its practical details. The author in his preface says: "If any one should traduce me for discovering the secrets of the building branch relative to the prices of work, I must inform him that I considered these the first rudiments of my plan. I humbly dedicate my endeavours to all in the building branches." The prices are only interesting as comparative, and we shall give a few of these to show the mode of measurement. The book is divided into 81 lectures, and concludes with a dissertation on the late Building Act. In this the author reasons, the insurance-offices ought to pay the fees of district surveyors. With this, no doubt, many builders will agree.

There are only two illustrations to the work, but these show the mode of working the continuous handrail with newels, ramps, and swan-necks, *but without wreaths*, that so many of the modern imitators fail to grasp.

Passing over the author's remarks on the History of Architecture and Mechanical Powers and Foundations, remarking on the way that his rough-and-ready rule of 1-14th part of their length as a scantling for piles in foundations is worth remembrance, we will see what he says of brickwork (so largely entering into the composition of the architecture of his day) in his own words: "Another great defect is the bulging, or convex situation, we often see arches in, after the houses are finished, and sometimes loose in the centre bond or key. The first of these defects is, in reality, no more than a fault of the practice of rubbing bricks too much off on the inside" (to make front joint close). "The observation of camber arches not being skewed enough is an egregious fault, because it takes greatly from the beauty of the arch as well as its significancy. The proper method of skewing all camber arches should be one-third of their height; for instance, if an arch should be 9in. high, the skew (back) should be 3in.; if 12in., 4in.; if 15in., 5in.; and so of all the courses. Observe, in dividing the arch, that the quantity consists of an odd member; by so doing you will have a proper bond and the key-bond in the middle of the arch." Vaults—all piers, or abutments to be one-sixth of the width of span is the author's rule. So many niches in brickwork are executed in horizontal courses by some of our principal disciples of this school, that it will be well for them to study the following:—"A niche is the inner or concave quarter of a globe, and usually made in walls on the exterior parts of a building to place figures or statues in. The practice of this in brickwork is the most difficult part of the *profession*, on account of the very thin size the bricks have to be reduced to down at the inner circle (called by bricklayers the pad block), as they cannot extend beyond the thickness of one brick at the crown or top, it being the usual, as well as much the neatest method, to make all courses standing. The most familiar way to reduce this point to practice is to draw the front back, &c., and make a template of pasteboard. The reader is to observe that one templet for the standing courses will answer for the front, and one for the side of the brick, and at the top of the straight part, from whence the niche takes its spring, make a circle of 8 or 9in. (the modern pad-block), and cutting this out of paste-board also, divide it into the same number of parts as the outward circle, from which you get the width of your front template at the bottom. The reason of this inner circle is to cut off the thin conjunction of points which must all finish in the centre, and which in bricks could never be worked to that nicety. It will be necessary to have one template made convex to try the faces of bricks and the setting. The stone you rub the bricks on must be cut at one end, and the exact form of the niche, or it will be impossible to form the faces properly. The level of the flat sides of the bricks is got by dividing the back into the number of parts of the front, and all struck to one centre. From the circle of the front of one brick set your bevel, which will answer for the whole. Observe that the bricks hold their full gauge at the back, or when you come to set them you will have much trouble.

"*A Circular Arch upon a Circular Plan.*—The best practical method I can give is, after you have divided the arch, and settled your bond in front, to make two moulds to the sweep of the wall and fix two uprights of wood a little above the top of the arch, one at the top and the other to be moved down to the top of the courses as they gradually rise; after which, with a rod with a prick in the end clapped close to these two ribs, strike the top sides of every brick (the under side may be marked by the preceding brick), and in this manner proceed all the way till you get to the top, which will give the exact curve required to the wall, and perpendicular to the ground plan." The author proceeds to instruct the bricklayer to level his walls every 3ft. or 4ft. in height, and be careful to plumb his groins and chimneys. He laments the ignorance of the *profession* in regard to the proper dimensions of chimneys and their openings, and in consequence the great disturber of a family, *smoky chimneys*; and states regretfully, "even Palladio only guessed at its properties."

Starting with the statement that a room too glaring with light is as defective as if it had too little, he gives the following rule: Multiply the length and breadth together, and the product by the height; the square root of the last product will be the quantity of light required.

The price given as the prime cost of a rod of brickwork, with bricks at 30s. per m. is £9 3s.

Speaking of plain tiling, he calls attention to the judgment required in getting the exact pitch of the tilting fillet at the eaves, a point I have no doubt many modern workmen, since the revival of plain tiling, have found themselves brought in contact with, and in more than one instance I have found the error overcome by plastering each lath with hair-mortar to make the tile bed, and the poor architect wonders why old plain tile roofs are water-tight, but modern ones not so.

Our author says:—"Plastering is a most useful invention, and has greatly the preference of wood, for cornices, &c., but we see it often loses its effects when mixed with wood, as in base mouldings, &c." After complaining of plaster enrichments being laid on wood mouldings as bad taste, he proceeds:—"To the immortal credit of the present age, it may be affirmed that this branch of business is in its full meridian of lustre, on which head the Messrs. Adams deserve particular honour, being themselves the originals of many capital designs, which almost beggar description, from the spring of which the whole mass of surveyors and petty mixturers have found matter to supply their own want of genius and invention." He then regrets that Messrs. Adams ruin their work by want of projection. He gives the prices of ribbons and roses at 1s 6d per foot superficial, and trophies, cases of arrows, &c., at 5s. super, and festoons and flowers at 3s. 9d., and friezes to chimney-pieces, enriched, at 3s. 6d. super. This is interesting as showing the cost of some of the really good work we see done about this date.

Carvers' work contains nothing interesting except prices. These are given—Ovolo to deal framing, carved egg and tongue per foot run 4d., on hard wood 6d. Friezes fluting 6in. wide and upwards, 1s. 6d. super. Corinthian capitals 9s. per foot super. Ionic capitals 6s. per foot super. Festoons from 4s. to 8s. per foot super.

Lecture 22 treats of the construction of the Dado, and this is a very important lecture, and as the dado is now thoroughly believed in by the majority of architects, and so few understand its construction, I will give this lecture rather fully.

"Dado is the die or the entire part of an order, between the base and cornice of the pedestal, and by architects is attributed to that plain part of a room between the base and surbase mouldings. The chief theory to be considered in the practice of dado is the manner of putting it up, which requires some thought in order to secure it from casting; the method of keying only being found insufficient without a proper manner of placing the keys.

"When you key your dado, leave the keys long enough at the broad end to reach the joists or floor, and put the broad ends of them downwards for this reason, that there is a proclivity or tending downwards in all work, which can never be detrimental to dado thus done: for if the key goes to the floor, there it stops, and if it should shrink, the proclivity of the dado will ever keep the work straight. If the broad ends were upwards, the dado might drop from the keys, and render them of no use."

In putting dado round windows mind to keep up the front of the elbow a little that the shutters may open easily. Dado in all angles must be grooved; observe also that no nails be put in the bottom edge of dado; let it receive no fastening but what it has from the keys; if it be confined both at top and bottom, it is sure to break. As to the height of dado the window is to be the guide. Some architects propose a fifth part of the height of the room, but this will not suit very low nor very high rooms. I think dado should never be higher than 3ft. 9in., nor lower than 30in. If rooms were all about 12ft. high, a fifth part would do very well. If there are columns or pilasters, the dado should in every respect be subservient to the pedestal of the order. I hope, after this careful specification, I shall see no more dado *nailed through the front to grounds*, and afterwards rent in twain, calling for the attention of the painter with his hard stopping, that shrinks and drops out.

The author then cautions his readers not to spoil their mouldings by too many members, and describes this as the fault of the age, and to consider their position, and tells them never to exceed the following bounds, viz: To make the cornice 1-24th part of the height of the room, nor to project less than two thirds its height. The other branches of joinery, such as doors, sashes, floors, &c., are practically treated. With regard to doors he describes the meaning of a double margin door, that it represents a pair of folding doors, and describes its proper construction. In connection with floors, he calls attention to the proper thicknessing the ends of boards next the wall before laying as it is not possible to do so afterwards; that in all tongued-beading joints the tongued board should be laid first, as the joint could then be fitted with a smoothing plane; and in laying dowelled floors to give the *least* possible draw to the dowels to prevent bruising the ends. Writing on sashes, he warns the workman to make the dowel not less than 4″ long, and on shutters he gives what is afterwards given more elaborately by Nicholson, viz., how to cut shutters in two heights. I fear there is not one joiner in a thousand that could do this.

"If shutters be hung double, that is to say, cut in the middle, they must always be hung the whole length first, and then taken down and cut; observe also with regard to this last particular, that you do not cut your joint by the range of the middle bar (meeting head), but square from each outward stile till they both meet in the middle; the reason of this is obvious—if the sash-frame should incline either way they will not open if cut otherwise than square."

The wood doorways we so frequently see in work of the period are treated on exhaustively; and prices for Corinthian, Ionic, and Doric given, and the construction described. As these are not likely to come into use, we will pass on to wood chimney-pieces, and these are interesting as showing prices.

	s.	d.
Plain chimney-pieces, per foot	1	0
Ditto with breaks	1	3
,, ,, dentils	1	6
Frets to friezes, per foot run	2	0
Common fillet dentils	0	4
Flutings in friezes, 6in. wide, per foot ...	2	6
Flutings and beads in friezes, run	0	2

The author seems weak in his masonry, and only gives a few prices, as follows:—

	s.	d.
Portland paving, per foot super	1	6
Purbeck in random courses	0	7½

	ft.	in.
Key and ashlar fronts of Portland stone, super	1	6
Portland astragal steps, charged at 3s. per foot cube, and 1s. superficial, measured over faces.		

	s.	d.
Mouldings of Portland stone, super. ...	1	7
The shafts of columns in Portland ...	1	2
Bases and caps to ditto	3	0
Ditto fluted and cabled, labour only ...	1	9
Dorick entablatures	5	6
Carving capitals of Corinthian and Composite orders, per foot super	11	0
Portland geometrical steps	10	0
And the stone added at (cube)	3	6
Purbeck ditto	2	6

The author follows with a long list of prices for task work, which indicates that piece-work was more general in the building trade in his time than now.

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* A Key to Civil Architecture; or, The Universal British Builder. Likewise, A New Criterion, or Universal Estimator. By THOMAS SKAIFE, P.A. Third Edition. (Printed for R. Baldwin, 47, Paternoster-row. 1788.)

Piece work—Common brickwork per rod	£1	3	0
Camber arches, rubbed, gauged, and set, per foot		1	0
Circular ditto, per foot		1	2
Ditto to a niche		3	6
A circular arch on a circular plan ...		2	0
Brick cornices, per foot super		2	6
Carpenters' and joiners' work—Roofs per square ... ... 6s. 6d. to		9	0
Bridged floors with binders, per square		8	0
Naked floors		5	6
Plates, bond lintels, &c., per 100ft. run		3	0
Door cases, per foot		0	1½
Clean dowelled floors, per square ...		17	0
Straight-joint ditto, per square ...		8	0
Folded floors		6	6
Doors, ovolo and flat, per foot super...		0	6
Door, bead and flush both sides ,, ...		0	8
Sashes and frames, with oak casings, sills, beads, &c., per foot super ...		0	7
Ditto, with mahogany sashes ,, ...		0	8
Fir sashes and frames, together ...		0	5
Gluing-up Ionic caps for carver, each		2	0
Ditto Corinthian, per foot super ...		0	6

The author closed with a lecture on the Building Act, and the following is too good to be overlooked. "The terrors of a fine . . . would have deterred many builders in Marylebone from attempting matters they had neither the means nor experience to carry out. Many to my knowledge turned builders who never served any time to the business, and without the possession of one requisite in the science, unless a thirst for money may be called so. And to the lasting shame of the London builders, it may be justly affirmed, that there are hundreds of buildings about the town which are of less value when finished than the materials were before being used."

In taking leave of our author, I think we may all learn a lesson from him of thoroughness in practical details, and also in knowing that there were pretenders in his days as in ours; and now when professional feeling tends to examinations and diplomas, and making what is really an artistic profession into a close trades union, that, after all, the best diploma is a well-executed building, and that he that does his work better than the pretender will in the end reap the harvest.

R. P.

THE DORÉ GALLERY.

As a delineator of character, M. Doré wields a powerful pencil. His "Neophyte" was a marvel of composition representing convent life. It depicted a young monk, recently admitted, seated in the choir during service, and surrounded by other older monks who are grown careless and indifferent, and whose expressions are intended to convey the restrictions and blighting influences of a monastery. We have just seen a companion picture to this, entitled a "Day Dream," in which a young man clad in monastic robe and cowl is seated, playing the organ in the choir of a church. At the left of the picture we see the half-darkened choir thronged by a procession of monks carrying lighted tapers, while raised in an organ gallery is a young Carthusian before the instrument playing a chant. On the further side of the organ a stream of light comes through the window, and in the gleam of radiance the artist has depicted in faint but iridescent hues, the fair form of a young girl, who is evidently the dream of his imagination. The strains of music have conjured up the fair spectral image in the mind of the youthful devotee, whose head is turned aside. The expression of the face is intellectual and meditative, and denotes, moreover, the purity of the novice. The drawing of the accessories is a little harsh; but the composition and the colouring are both masterly, and the spectator, as he stands before the canvas, can almost realise the religious and poetic fervour of the scene depicted.

"Rainbow Landscape, Loch Carron," is another recent work by M. Doré, in quite a different direction. It is a boldly-painted view of a Scotch lake, which is half-hidden in the depths of the mountains which rise around it. The foreground stands out in realistic power, and the blue water of the loch is just discerned below the mists and clouds which envelop the opposite mountain, while the rainbow which spans the chasm helps to irradiate the scene, and to throw over it an almost Alpine effect of sunlight and cloud. The picture certainly sustains the artist's reputation as a powerful painter of effect. Another picture shows a grand sunset scene. In the foreground is dark hilly ground, broad, and deep in shadow, while the distance of hills are bathed in a rich red glow of the setting sun. The light and dark shadows are truthfully managed, and the whole scene breathes the quiet stillness of a sunset. In striking contrast below this picture we see a companion subject, a mountain chasm down which a relentless torrent is rushing, sweeping in its passage the *débris* of a pine forest which clothes its sides. It is a masterly performance, as vigorous in handling as the conception itself. Those who have an hour to spare, and who can appreciate the grand style of painting, whether in historic, imaginative, or landscape subjects, will enjoy this new accession to the Doré Gallery, which the proprietors have opened to the public.

THE A B C OF ART.*

We have read many introductory treatises on drawing and design, but our experience has been that while some of them may simplify and methodise the student's first attempts, others not unfrequently bewilder by placing before him dry definitions and rules which render drawing tedious. We have read through Mr. Robert T. Stothard's "A B C of Art," but we cannot say that he has been more successful than his predecessors in smoothing the paths, or pointing out a royal road to art. We waded through more than half the treatise before we came to the principles of Mr. Stothard's teaching, and even now we are not sure that we have fully grasped the system which he declares is simple enough. Why such a long preface is introduced with quotations from Shakespeare, Lavater, and the late Prince Consort we are at a loss to see; nor can we precisely understand the bearing of physiology and physiognomy upon the system proposed. We are afraid if a knowledge of these sciences were required, it would frighten many people away from drawing. Mr. Stothard's formula we give in his own words:—"The A B C, being the first letters of the alphabet, will rule all applicable to the form; the second three, D E F, will confine itself to light, shade, shadow, and refraction (? reflection); and the third three, G H I, will comprise colour." In a section called "Deductions" the author proceeds to show how a ball is shaded, and describes by diagrams the progressive stages or sittings required to make a shaded drawing. Reference is often made to a "law before laid down," but what this law is does not appear however, and we can hardly follow the author through his nine stages of shading, as any task may be similarly divided into arbitrary stages. Having gone through the process of representing light and shade, a similar division of the second stage of drawing is proposed, and again colours are subjected to the same process of treatment. The latter stage is simple and obvious enough. The treatise concludes with remarks on fashion as detrimental to art, and we take leave of it with the observation that while the author's principles are very likely good, he has rendered them so ambiguous by mixing them up with metaphysical ideas having no direct bearing on the subject, that we are not disposed to exert ourselves very much to find out what they are.

CARIB ART.

Prof. Otis T. Mason, of Columbian College, Washington, D.C., communicates the following notice of some interesting observations recently made by him to the *American Art Review*:—"The student of archæology often finds himself upon the brink of a wide chasm which separates the proximate from the remote past. In America we have the aborigines, whose shadow has but recently passed across the Continent; and, far back of them, the mound-builders, the cliff-dwellers, and the architects of Middle America and Peru. The same is true of the Eastern world; back of the past lies antiquity. It is very difficult, at times, to find the bridge which connects these epochs of civilisation; but when such a viaduct exists, it leads to most important consequences. It has been my good fortune, lately, to connect the Carib artists of the days of Columbus with those who sculptured the stone collars and mammiform stones of Porto Rico. Herrera informs us that, when a company of Spaniards in Cuba visited a certain *cacique*, he caused them 'to sit down on a seat made of a solid piece of wood, in the shape of a beast with very short legs and the tail held up, the head before, with eyes and ears of gold.' Two of these very stools have been found in a salt-cave in Turk's Islands, ornamented just as described in Herrera. Now for the connection. In the Latimer collection from Porto Rico there is a stone stool, carved from a single slab, and corresponding in every particular to the wooden stools on which the Spaniards sat. This stool and others of varied pattern were found, with stone collars and mammiform stones, on the island of Porto Rico. So that the connection is complete between the old polished-stone-workers and the wood-carvers of Columbus. This leads to a further discovery. In nearly every archæological museum are stone implements resembling *metates* (cocoa mortars), but ornamented with scroll patterns on the inner surface. Now, no savage would be so foolish as to spend months in carving an elaborate pattern which a muller would destroy in the preparation of a single breakfast. These ornamented so-called *metates* are seats, one and all, and belong to the class above-described.

CHIPS.

The new Roman Catholic schools for St. Walburge, Preston, were opened on Wednesday week. They are built of brick, and measure 120ft. 4in. in length, by a uniform width of 34ft. 6in. Accommodation is provided for 520 boys. Mr. Tomlinson, of Preston, was the principal contractor, and the subcontract for brickwork was taken by Mr. Bickerstaffe, of the same town.

A new gas-holder is approaching completion at Louth, Lincolnshire. The excavation of site has been carried out by Mr. W. Nicholson, and the contract for brickwork by Mr. S. Harrison, both of Louth, while the ironwork for the tank is being supplied and erected by Messrs. Clayton, of Leeds.

Extensive additions are about to be made to the Walsall workhouse, from the designs of Mr. T. H. Fleeming, of Walsall, architect to the board of guardians.

At a meeting held at Brentwood, on Wednesday, Mr. Ernest C. Lee produced and explained his plans and designs for the rebuilding of the unsightly brick church of St. Thomas, and it was decided to proceed at once with the first section—the western part of nave. We illustrated Mr. Lee's design on July 25, 1879.

The Louth Commissioners of Sewers last week adopted a scheme, prepared by Mr. J. Maughan, surveyor to the court, for draining the Upper Marshes. The estimated cost is £4,700.

Tenders were accepted last week for the erection of a new church at West Vale, Halifax. The architect is Mr. T. H. Rushworth, of Carlton Chambers, London.

A new organ, in pitch-pine case, was opened on Sunday week at Westgate United Free Methodist Church, Bradford. Messrs. Couacher and Co., of Huddersfield, were the builders.

An inquiry was held at East Dereham on Tuesday week, before Captain R. C. T. Hildyard, an inspector of the Local Government Board, respecting an application from the local authority for sanction to borrow £5,000 for works of sewerage and sewage disposal, and £4,000 for water-supply. Both schemes were unopposed, and the inspector promised to recommend the loans.

The local board of Keighley have decided to purchase 71 acres of land at Marley, at a cost of £10,500, for the purposes of sewage disposal.

The open space near the Victoria-station, Norwich, known as Chapel-field, is being improved at the expense of the town council, the outlay being about £1,500. The work is being carried out by Mr. Lake, the city surveyor, in conjunction with Mr. Elphinstone, horticulturist. The whole area has been retrenched and sown with grass-seed. The iron railing round the field has been made more secure by iron netting, executed by Messrs. Barnards, Bishop, and Barnard, and the children's playground has been fenced in, Messsrs. Boulton and Paul being the successful tenderers for the latter contract; a lodge for the keeper is about to be built. Amongst the special gifts are gymnastic apparatus, seats, a drinking-fountain and water-supply; and Messrs. Barnards, Bishop, and Barnard have handed over to the city the iron pavilion shown by that firm at the Philadelphia and Paris Exhibitions for the nominal sum of £500, including construction and repainting, and it is now in course of re-erection. The field is to be opened as recreation-grounds and gardens, by the mayor, in the course of a few weeks.

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* A B C of Art; being a System of Delineating Forms and Objects in Nature, &c. By Robert T. Stothard, F.S.A., &c. London. W. H. Allen and Co., Waterloo-place.

COMPETITIONS.

Beverley.—On Tuesday a new church erected in Holmechurch-lane, Beverley, on the site of the old parish-church, was consecrated. The style is Geometrical, or Early Decorated, and the tower, when finished, will have a peal of bells. The church comprises a nave 70ft. long by 23ft. wide, and 47ft. high to the ridge, a chancel 25ft. by 23ft. wide, a porch, organ-chamber, and choir-vestry on the south side. The tower is 12ft. square, 94ft. high, and rises at the south-west angle. The building is erected of Bradford stone, with Whitby Crag Moor stone dressings to the window tracery, sills, copings, &c. The interior of the wall is lined with red stock bricks. Messrs. Simpson and Malone, of Hull, and Mr. Elwell, of Beverley, are the contractors. The design of the building is by Messrs. Smith and Brodrick, of Hull, who have also superintended the erection of the church. Accommodation is provided for 360.

Exeter Hall.—The designs prepared by Mr. Alfred R. Pite have been selected by the Committee for the proposed additions and improvements to this building. The property is now in the possession of the Young Men's Christian Association, and will speedily be adapted to their requirements, while the large hall will still be retained as the great centre for public meetings with increased facilities of exit.

St. Matthias' Church, Upper Tulse Hill.—Since our review of these designs last week was written, a difference of opinion has arisen in the committee respecting the decision, which we had just time to record at the moment of going to press last week. It will be remembered that in our issue of July 23, an announcement appeared in our advertisement columns from the building committee thanking the numerous competitors for their trouble, and announcing "that the selection had been made, after careful regard to the committee's requirements." We thereupon lost no time in obtaining information regarding the decision, and were informed that the design marked "Red Cross" had been selected conditionally, though "Experientia" had been preferred by two or three others. A subsequent meeting on Tuesday week last confirmed this decision by a decided majority, and the architects of that plan were then communicated with, and were given to understand that their designs were favourably regarded. For some reason, the chairman has endeavoured to overrrule the committee's selection, and we now hear that another design, with the motto, "R. K.," has been brought forward in opposition. We have not been enabled to gather on what grounds the chairman or a small section of the committee have attempted to overrule the decision previously arrived at, but it is rumoured that an influential donor has something to do with the matter. To appease the authors of "Red Cross" an offer of £25, we hear, has been made to them, which they have declined to accept—a proceeding which, if it is true, rather compromises the affair. So the matter rests at present. We are, of course, not in a position to vouch for the correctness of all we hear; but there will be another committee meeting to-day, at which the question will be fully discussed, and we hope—as we have every reason to believe—justice will be done. We may mention, in addition to our notes, that "R. K." shows two designs, and the future extension is proposed to be made on one side. The style is more florid than the others, while no builder's estimate has been sent in—reasons which probably influenced the committee in putting this design aside. A letter appears elsewhere from a competitor, calling in question the action of the committee on other grounds.

SCHOOLS OF ART.

The Crystal Palace School of Art.—The 20th session of the school closed on Saturday last, when the works of the lady students were examined and the prizes awarded by the judges—Mr. Yeames, R.A., Mr. Hine, of the Institute of Water-colour Painting, and Mr. Woodington, A.R.A., the sculptor. The general classes have lately increased to nearly 500 students in the division for ladies alone receiving systematic instruction in literature, science, and art, conducted under the syndicate appointed by the Senate of the University of Cambridge, and entitling them to the Vice-Chancellor's certificate upon passing the examination. In the Art classes a scholarship of £30 is awarded annually to the student showing the greatest proficiency in any one of the departments of water-colour painting, drawing from the antique and from the life, and modelling from the figure. These classes are directed by Mr. E. A. Goodall in landscape and architectural subjects, and by Mr. Smallfield in figure subjects; while Mr. O. Von Glehn superintends the drawing school and M. Vinoelst the modelling in clay from the antique. The judges awarded the silver medal in water-colour painting to Miss E. M. Merry, for her drawing of part of the Hall of Columns, taken from Karnak, in the Egyptian Court of the Palace. The certificate of honour was gained by Miss Holmer for her drawing from the same subject. In the class of figure-painting from the life, in water-colour, the silver medal was awarded to Miss M. Bedale, for a picturesque figure of a man in Italian costume; two drawings by Miss Bethune being highly commended. In the class of chalk-drawing from the antique and of the head from life, the silver medal was taken by Miss F. Marsh, and the certificate by Miss A. M. Cowper. In the sculpture class, the certificate was awarded to Miss B. A. Brown, for her model from the antique draped statue of Euterpe in the Munich Museum; and this work being considered to be that of the highest merit in the school, gained for Miss Brown the scholarship of the year. The other works in modelling were from the Venus of Milo and the Discobolos of Naukydes, reduced to about half life-size, all of which showed excellent study. The sculpture students may be said to bear off the honours of the school, as might be expected, when they have before them constantly examples of all the greatest works in existence. In painting, the instruction has not hitherto been equally extended to the highest form of oil-painting, though this might well be done, now that the Crystal Palace contains, in the picture-galleries, so many remarkable examples, particularly of the modern schools of France, Germany, and Belgium, and some works of the old masters.

PARLIAMENTARY NOTES.

Labourers' Residences.—Mr. Hubbard, on Monday, asked the Secretary of State for the Home Department whether, in view of the deficient residential accommodation for the labouring population within the metropolis, aggravated by the demolition, under Improvement Acts, of unsuitable habitations not hitherto replaced, he would consider and propose some means through which, at the earliest period, a remedy might be applied to an evil so prejudicial to the health and morals of the people. Sir W. Harcourt said that the matter was a very serious one, and required a great deal of consideration. Every exertion would be made to carry out the objects stated in the question.

CHIPS.

The Cutler's Company, at a meeting held at Sheffield on Tuesday, elected Mr. William Chesterman, of Bow Works, Sheffield, as the Master Cutler for the ensuing year.

On the 22nd ult., the parish-church of Wormshill was reopened after partial restoration. The roofs of the chancel and nave, together with all the seats throughout the church, have been renewed, and the walls strengthened and repaired. Old windows have been opened out, and new windows made, together with an entirely new floor of encaustic and other tiles. A very interesting old oak pulpit, of the Tudor age, has been cleaned of paint, and has been set upon a new base after the design of the architect, and made of the stoutest portions of the old oak beams of the chancel aisle. The works have been carried out by the architect, Mr. J. Clarke, F.S.A., and the contractor, Mr. J. Lawson, of Whitstable. The total cost was about £1,200.

The memorial-stone of the second section of the restoration of St. James's Church, Exeter, was laid on Tuesday week. Mr. R. M. Fulford, of Exeter, is the architect, and Mr. J. R. Gibbard, of the same city, is the builder; the cost of the present work will be £2,500.

Truth asks: Can it be true that when the chapel of New College was undergoing restoration, one of the authorities caused petticoats to be painted over several of the stained-glass figures who were scantily clothed?

It has been decided to hold the Annual Congress of the Cambrian Archæological Association at Pembroke, under the presidency of Mr. C. E. G. Phillipps, of Picton Castle. The meeting will be held towards the close of the present month.

Building Intelligence.

Helensburgh, N.B.—The new Hermitage School at Helensburgh, erected by the school-board for Row, was opened on Monday. The building is divided into two portions for girls and boys, and is Gothic in style; the main frontage is 115ft. in length, and is broken up by turrets, iron-crested steep roof, and central belfry. There are eight rooms in all, so separated by movable partitions that they can be thrown into three large apartments. The upper parts of these partitions are glazed. There are four other class-rooms. The windows are placed high, and are fitted so as to allow heated air to escape without causing a down-draught. The heating is by hot-water pipes. Adjoining are large playgrounds, and a janitor's house. The total accommodation is for 500 children. The architects are Messrs. William Spence and Son, of Glasgow.

Ilfracombe New Swimming-Baths.—In the autumn of last year the directors of the Ilfracombe Hotel Company, Limited, decided to increase the attraction of their beautifully-situated hotel by constructing a swimming bath, and accordingly instructed their architect, Mr. W. M. Robins, of Ilfracombe, to prepare designs and obtain tenders for the work. The bath is situate at the west end of the marine terrace of the Ilfracombe Hotel, and stands on a portion of the foreshore, leased from the Commissioners of Woods and Forests, and is protected by a massive concrete sea-wall 56ft. thick at the base, from the top of which a fine sea view to the westward is obtained. Owing to the peculiarities of the site, about 11,000 tons of rock had to be removed, and this, together with the sharp sand and shingle on the beach, supplied sufficient materials, save lime and cement, for the construction of the whole of the masonry and concrete work. The building is 160ft. long by 56ft. wide, and the water surface of the bath 138ft. by 34ft. The depth at one end is 9ft. and at the other 3ft. The floor is lined with white grooved tiles and the sides with white glazed bricks. Around the sides are arranged over 60 dressing-rooms, each 5ft. by 4ft., constructed of varnished pitch pine and fitted with mahogany shelves, brackets, and seats. Each room has a window and sash door in tinted glass, and is furnished with mirror, hat-pegs, comb, and brush, &c. Upon the tops of the dressing-rooms is a large promenade capable of holding 500 non-bathers. Spring-boards, diving tables, w.c.'s, and lavatories are provided, and ample facilities for heating the bath for tepid bathing is secured.

Jersey.—The nave of the new church of St. George, Jersey, which is the only portion at present completed, was opened for divine service on Tuesday, the 20th July. St. George's Church, the foundation-stone of which was laid in 1876, has been designed by Mr. P. B. Hayward, son of Mr. John Hayward. It will consist, when completed, of a nave 58ft. long by 22ft. broad, north porch, chancel 24ft. by 18ft. 6in., and tower, with a saddle-back roof of high pitch, the north side forming an organ-chamber and vestry. It is designed in the simplest form of the Lancet period of architecture, partly on account of economy, but more especially on account of its suitability to the material employed in its construction—viz., granite, which is the principal building stone of the island. The side windows of the nave are of single and double lights, and a lofty triplet occupies the west gable. They are filled with cathedral glass of various tints, given by Mr. Drake, of Exeter, who has also presented to the church a small stained-glass window in the west gable. The cost of the building hitherto has been about £1,000.

Manchester.—Considerable progress has recently been made in the Gothic stone building which is being raised, from the designs of Mr. George T. Redmayne, for the Manchester School of Art, in Cavendish-street, All Saints, Manchester. The cost of the building, irrespective of internal fittings, will be about £11,000. The basement of the building contains a modelling-room, the dimensions of which are 16ft. by 26ft., a casting-room, 14ft. by 26ft. and a committee-room, 26ft. by 26ft. On the same floor are the residence of the custodian and other offices, and adjoining this suite of offices it is proposed to erect a dining-hall, 38ft. by 24ft., for the accommodation of the students. The ground-floor is occupied with four studios —two of them being 38ft. by 24ft., another 64ft. by 24ft., and the fourth, 53ft. by 26ft. The same floor has, in addition, the head-master's room, 15ft. by 17ft., the second and third masters' room, 17ft, by 15ft., and the custodian's room, 13ft. 6in. by 13ft., with a range of lavatories, &c. The first floor contains an art gallery, the dimensions of which are 88ft. by 25ft. and 22ft. in height. Two other studios (No. 5 and No. 6) occupy a large portion of the first floor, the former being 54ft. by 26ft., and the latter 64ft. by 25ft., each having an altitude of 24ft. 6in. Over the entrance is an oriel window, composed of four lights, enriched with Gothic tracery, which lights are to be filled with specially designed stained glass. We have illustrated the exterior of the building.

Pinhoe.—The fifteenth-century church of St. Michael, at Pinhoe, Exeter, was reopened on Saturday week, after restoration. The chancel has been almost entirely rebuilt, and a vestry and porch have been added. The new chancel roof is of English oak, picked out with gold, vermilion, and green, and covered externally with slate, and a ridge of Bath and Hamhill stone. The nave and aisle roofs have had colour applied, as a groundwork for future embellishment, and the walls are stuccoed a warm colour throughout. All these decorations, and the reglazing of the windows, are the work of Mr. F. Drake, of the Cathedral-yard, Exeter. The carving is by Mr. Harry Hems, of Exeter, and includes the placing of angels bearing shields at the intersections of ribs in nave-roof; the restoration of the grand old rood-screen, which runs without a break from wall to wall, the partial re-erection of the pulpit, and the addition of seating in solid oak, modelled after the old bench ends. The nave and aisles are lined with memorial stones, the spaces filled with coloured tiles, and the chancel-floor is laid with encaustic tiles by Messrs. T. and R. Boote, of Burslem. The organ has been cleansed and refixed by Mr. Hawker, of Exeter. The chancel has been restored from the designs of Mr. Ewan Christian, of London, the nave, aisles, and tower from those of Mr. R. M. Fulford, of Exeter. Mr. James O. Fleming was clerk of works.

Plymouth.—On Monday week the Mayor of Plymouth opened the new Board-schools in Oxford-street, built by Messrs. Lethbridge and Foot, contractors, from the designs of Mr. Silvanus Trevail, architect, of Truro. The schools are comprised in a block of buildings measuring about 180ft. long by 60ft. deep, and are divided into two separate departments. Gas is laid on throughout the building; the heating is by open fireplaces; and Tobin's vertical system has been adopted in the ventilation. Internally the walls are dadoed in pitch-pine throughout to the level of the window-sills, and the main timbers of the roof are left open and varnished, the work being of a plain and substantial character. Externally the treatment has been that of Early Domestic Gothic in style; the walls are of blue limestone, with dressings in the same material of a lighter tint, the contrast being effective. The roofing is of Delabole slate, relieved by fancy cut bands, and is surmounted by a wooden bellcote, rising about 30ft. above the ridge.

Radcliffe Bridge, near Manchester.—The New Jerusalem Church, Stand-lane, was opened on Wednesday week (July 28th). The new church, which stands upon the site of the old one, is in the Free Classic style, from designs by Mr. Thomas Thorpe, architect, of Whitefield. It is of stone externally; the dressings are from the Slaithwaite quarries, and are polished, and the wall-spaces are filled in with Lightcliff parpoints. The whole of the woodwork is of varnished pitch-pine, except vestibule and communion furniture, which are of polished oak, and has been executed by Mr. John Allen, of Radcliff. Messrs. Williams and Hope, of Dinting, have been contractors for the masonry. The cost of the church is nearly £5,000.

Shipston-on-Stour.—Memorial-stones have been laid of a new Wesleyan Chapel now in course of erection at Shipston, near Banbury. It is Early English in style, and is being built of Armscote stone, rock faced, with Bath stone dressings. The chapel will be 40ft. long by 23ft. 6in. wide, and will seat upwards of 200 people; attached will be a schoolroom 20ft. by 16ft., with class-room, minister's vestry and offices. The chief front to the road will have a four-light window with cinquefoil tracery, and on either side will be a buttress finished with pinnacle and carved finial. Behind the rostrum will be a chancel lighted by four lancet-headed windows. The beams of the open roof will be of pitch-pine, stained and varnished, and the seats of the same material, but varnished only. Mr. John Wills, of Derby, is the architect, and Mr. James Pickering is the builder; the outlay will be about £1,000.

Wesleyan Chapel Building.—During the year 126 new chapels have been built, 60 of which are in places in which no Wesleyan chapel before existed, and the rest supersede smaller and inferior buildings. There have also been 96 enlargements, and altogether above 30,000 additional sittings had been provided at an average cost in the case of the new chapels of less than £6. Twenty schoolrooms have been erected and thirteen manses. The total cost of all the erections and enlargements and of forty-two organs has been £318,175, and the temporary debt is £75,807. The Chapel Fund has given £13,439, and lent without interest £10,310. Sanction has been given to the erection of 173 chapels, 18 ministers' houses, 17 schoolrooms, and 23 organs, with 110 enlargements, the estimated cost of the whole being £253,655, and the increased number of sittings in the chapels 23,480.

West Kilbride, N.B.—The foundation-stone of a new Free Church was laid in Main-street on the 24th ult. The church will be 65ft. 6in. by 37ft. inside main walls, and will accommodate 450 persons in area, and a gallery over entrance lobby. To the rear are placed the session-house and vestry. The masonry is of red freestone, the chief frontage being in bull-nosed rubble and polished dressings. The chief consists of a projecting doorway, with gable above, and recessed and panelled jambs. This is flanked by buttresses, and behind the gable is a rose traceried window. On the left hand and west front will be a tower, containing stair to gallery, and finished by a spire, rising, in all, 120ft. from ground. The ceiling will be coved on the side walls, and waggon-headed in the centre, plastered between the couples, the tie-beams of which, and of exposed parts, will be of dressed timber. The platforms, pews, and fittings will be of pitch-pine. Mr. James Ritchie, of Glasgow, is the architect, and the chief contractors are, for masonry, Mr. J. MacFarlane, West Kilbride; joinery, Mr. Miller, Glasgow; plastering, Mr. J. Boyd, Saltcoats; and glazing, Messrs. J. and J. Kier, Glasgow. The total cost will be about £3,000.

Whittle-le-Woods.—The foundation-stone of St. John's church, Whittle-le-Woods, near Chorley, was recently laid. The church is in the Early English style, and comprises nave 82ft. long by 32ft. 6in. wide and 45ft. high; south aisle, 82ft. long by 13ft. 6in. wide and 30ft. high; north transept, 19ft. 9in. long by 30ft. 9in. wide, the roof intercepting with the nave. The chancel will have an octagonal apse 37ft. 9in. by 25ft. by 32ft., and will accommodate a choir of 40. The organ-chamber will be 15ft. by 15ft. and 30ft. high, and the vestry under the tower 15ft. by 15ft. and 19ft. 6in. hgih. Accommodation will be provided for 572 persons. Adjoining the north transept a lofty tower will be erected, sufficiently spacious to contain a peal of eight bells. The internal dimensions of the tower will be 15ft. by 15ft. and 90ft. high. The whole of the work has been designed by Messrs. Myres, Veevers, and Myres, architects, of Preston, Blackpool, and Westminster, who are carrying out the work. The contractors for the work are the Victoria Timber Company, Chorley; the amount of their contract being £5,428. Mr. John Bowen is acting as clerk of works.

* * *

On Saturday last there was opened at Wigan the first section of a tramway system to be constructed in the town and suburbs. The stables and offices, built by Messrs. W. and A. Bywater, of Pemberton, from plans prepared by Mr. R. A. Busby, architect, of Lord-street, Liverpool, comprise accommodation for over 50 horses, also engine and boiler rooms, hay-lofts, offices, &c., together with a house for the manager or foreman. The cost of the buildings, inclusive of house, fittings, &c., is £2,465, which sum gives a total cost per horse of under £50.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Received.—F. L., Birmingham.—E. W.—J. S.—T. of J.—G. S. S. and Co.—J. W. B.—S. and Son.—J. T.—A. C. and P.—M. B.—S. G. and Co.—A. of Oxford.—G. H.—M. E. T.

"BUILDING NEWS" DESIGNING CLUB.

We hope to publish our award in the above next week. The names, ages, and addresses of the members, and the time they have been engaged in architectural offices, must be forwarded by Wednesday next to this office.

Drawings Received.—J. B. Fowler, J. L., J. B. G., J. P. J. P. J., J. P. S., and H. R. G.

* * *

Correspondence.

THE ST. PAUL'S ECCLESIOLOGICAL SOCIETY AT SWANSCOMBE CHURCH, KENT.

To the Editor of the Building News.

Sir,—I should be obliged if you would correct the very incorrect statements, published in your paper of June 25, with regard to the visit of that society to the above church.

1st. They state "the restoration was carried out under the superintendence of Mr. Freeman, of Greenhithe, acting in conjunction with Mr. George Vulliamy, the architect to the Board of Works." Now neither of these gentlemen had anything whatever to do with this work. I was the architect for the whole of this work, also for the schools near the same. I made every drawing with my own hands, and wrote the specification. I found the work was of such interest that it demanded much care and attention. I visited the work nearly every week at my own expense. Mr. H. Saunders was my clerk of works.

2nd. The richly-sculptured tomb, also my design, is alabaster, not marble.

3rd. The spire and tower are covered with oak shingle, and not slated.

4th. The rector's name is the Rev. T. H. Candy, B.D., not Dandy.

With regard to the various points of interest I should have been glad to have been present to point them out, also to exhibit the tracings I made of the various figures and painted work I found upon the old plaster. A most interesting pamphlet has been written by Mr. J. A. Sparvel Bayley, F.S.A., giving a correct history of the church and the work of restoration.—I am, &c., JABEZ BIGNELL.

Wimbledon, Surrey.

P.S.—I have just read in your paper of to-day Mr. John W. Warman's letter, complaining of the blunders made in the report of the society's visit to Canterbury.

ST. MATTHIAS' CHURCH (TULSE HILL) COMPETITION.

SIR,—Living in the neighbourhood I think that it is only right that those gentlemen who have competed for the above church should know that a rumour is abroad to the effect that an endeavour is being made to throw out the design which has been selected. That the committee have acted fairly, your article in last week's paper fully bears out, and it is to be hoped that this competition, which promised so fair at the beginning, may not become a scandal.—Yours, &c., ONE INTERESTED.

SIR,—Without in any way questioning the decision of the Committee in this competition, I wish to draw attention to the following :—

It was stated in the conditions that no perspectives would be required. On reading through your account, in last week's paper, of the successful designs, I was greatly surprised to see that three or four of them had perspectives, and the one placed first had one fully coloured. So that those who did not send in perspectives were placed at a decided disadvantage.

If competitors wilfully ignore conditions in competitions, all fairness is at an end, and it will be hopeless for the Institute to try and bring about a better state of things.

I append a copy of the conditions, and a letter I received from Mr. Gadsdun.—I am, &c.,
R. J. H.

ST. MATTHIAS' CHURCH, UPPER TULSE HILL, BRIXTON.

INSTRUCTIONS TO ARCHITECTS.

THE Building Committee, in desiring to receive designs for the above, beg to call the special attention of Architects to the following requirements :—

1. The church is to be solidly built of red-brick or stone, with stone dressings. Any attempt at unnecessary ornament is undesirable.
2. The plans, elevations, and sections, which should comprise the church, with chancel, tower, spire, seating, and necessary fittings, boundary wall, gates, and approaches, heating, &c., to be drawn to a scale of 8ft. to 1in. on imperial drawing-paper, and mounted on strainers.
3. All ⅛ scale drawings, with the exception of plans, must be in line only. *No perspective required.*
4. The plans showing accommodation for 800 sittings to be arranged with a view to an economical enlargement.
5. As it is not intended to spend more than £7,000, including architect's commission, a detailed specification and estimate of cost from a responsible builder, who would execute the whole of the work according to submitted drawings and specification, should be sent in with designs.
6. The drawings are to be sent in *under motto only.*

When the selection of design has been made, an advertisement will be inserted in the *Builder* and BUILDING NEWS, announcing the motto of the design which has been chosen, and asking for the name and address of each competitor.

7. No premium is offered, but the Committee undertake to employ the architect whose design is placed first. The Committee do not pledge themselves to accept any design.
8. The Committee undertake to return all unsuccessful drawings, but will not be answerable for any damage in transit.
9. The Committee desire it to be understood that the church will probably be built in three sections.
10. Designs to be sent, carriage paid, to the Rev. J. T. Gadsdun, Honorary Secretary, 24, Elm Park, Brixton-hill, on or before the 1st day of July next.

24, Elm Park, Brixton Rise.
3rd June, 1880.

DEAR SIR,—Yours of yesterday duly arrived this morning, and, in reply, I can say that the Building Committee of St. Matthias' Church endeavoured to draw up the paper of Instructions for Architects as fairly as possible. If perspectives are sent in they will be put on one side. The principal approach should be at the corner of Tulse Hill, and the road shown in the site-plan.—I am, yours truly, JOHN T. GADSDUN.

LIGHT AND AIR.—LAYBOURNE v. KIDSTON.

SIR,—In answer to Mr. Banister Fletcher's letter of the 23rd ult., I beg to say that I did not for a moment expect that my short experience would have the same weight accorded to it as Mr. Hesketh's; but so as to let my client have the opinion of a more experienced man, I called in Mr. John Whichcord (the president of the Royal Institute of British Architects), whose experience, you will allow, is quite equal to Mr. Hesketh's or Mr. Banister Fletcher's in such matters, and he in his report confirmed mine in all its material points.

Mr. Banister Fletcher informs us that to test the quantity of light in one of the rooms he used the *Times* newspaper, and this could be read without difficulty. I myself should not say this was any criterion, as it is a well-known fact that the *Times* has such clear type that it can be read in a dark room by means of a farthing rushlight.

He also informs us that a glass panel in the lavatory floor has been boarded up to prevent the light descending into the shop. Now Mr. Banister Fletcher can hardly have used mature judgment when he said this, for it stands to reason that it is an utter absurdity, for who in their senses would block up light for the sake of doing it, as he implies, when all the light that can be got is required at that part of the premises, and of which there is already insufficient?

But I should rather say the panel has been boarded up to prevent people being seen from the shop while using the lavatory.

The deep shadow mentioned in Mr. Thomas's affidavit is a fact (and a very stubborn one), as it is there now to be seen, and will remain so as long as the defendant's building is its present height.

No account has been taken of the sunlight that used to shine on the skylights nearly the whole of the day previously to the erection of defendant's buildings, which now is wholly obstructed.

And it is also my opinion that the case is a miscarriage of justice.—I am, &c.,
WALTER J. N. TOMLINSON.

August 4th.

UNDERWRITING DWELLING-HOUSES.

Sir,—I do not wish to disturb the sanguine feeling entertained by "Architectus" as to the readiness or ease with which the existing machinery of building may be subordinated to meet the requirements of Mr Cresswell's undoubtedly desirable scheme. Before, however, any useful progress can be made, the exact qualities of the materials to be used must be defined, and a complete specification of the salient features, which should regulate their selection. A brick must not only be described as such, but its porosity and capacity of resistance to extremes of temperature, as well as its value in withstanding compressive strain, should be assured. Lime and cement should only be used on their own intrinsic merits, and not loosely received as the production or the manufacture of certain makers. Stone, regardless of the quarry from which it was extracted, should be challenged and submitted to the most reliable tests, competent to prove its fitness to withstand all the strains to which it may be subjected in its destined position in the building of which it is to form a part. I merely refer to these "leading articles," and for the present purposes disregard all questions of timber, iron, and the other materials used in building. But where is the architect to find the accurate means of testing even these few building materials? He cannot do it himself, for his experience does not qualify him for such a task. The clerk of works is even more dangerous in the matter, for the rules by which he is usually guided are both empirical and occult. The establishment of ready and cheap means of testing, conducted by those versed in all the details of material, both natural and artificial, can alone meet the difficulty, and no material should be accepted unless officially certified to be of the proper standing and fitness. Even after the difficulty of quality of material has been overcome, the more important question of supervising their proper combination has to be met. A visit "two or three times a day," is not calculated to meet the requirements of the case, and I almost fear, and judging from past and present experience, that a superintendent constantly on the job would not succeed in checking the desire to "scamp" the work. I doubt even if he slept on the premises, and took the additional precaution of imitating the weasel's vigilance, he would succeed in checking the chronic condition of indifference to quality of work of the modern builder. There is of course no insuperable obstacles to prevent a right and proper system being inaugurated; but Mr. Cresswell must not flatter himself that progress is possible in the absence of vigorous testing of the material, of which the new certified or classified houses are to be built.—I am, &c., CIVIL ENGINEER.

ANCIENT BUILDINGS IN HALIFAX.

SIR,—In your review of my book, "Ancient Buildings in Halifax," in your issue of yesterday, you made several remarks which, as they contain errors of fact, I trust you will permit me to correct. You express an opinion "that the drawings in many cases have been copied from photographs." In one instance only, that of a building now destroyed, has such been the case. Your insertion of this letter may remove an impression which is certainly calculated to deprive me of any credit due to my pencil.

The bay-windows in Plate VI. are not, as you think, out of perspective, their covers being placed in the building at a considerable angle to allow the rain to run off. They can, therefore, be seen from below, which gives an odd appearance on the spot. I surely am not to be censured for this.

The table in Plate XXV., which you think "quite modern in spirit," is obtained from one in a fourteenth-century MS., "The Romance of Alexander," in the Bodleian Library.

The house in Shibden-park was removed by Mr. Lister to prevent its destruction by the railway company, and has been most truthfully restored. It now presents exactly its original appearance, and I am sorry you do not like it.

The coved woodwork in Plate XIII., which you think so singular as almost to doubt its existence, is, in fact, not an unusual feature in timbered architecture. Examples of it are found at Agecroft, Samlesbury, and Speke Halls, Lancashire; Little Moreton Hall, Cheshire; St. Mary-le-Wigford, Lincoln; Harrietsham, Kent, and other places innumerable. In the building I have depicted at Halifax it actually still exists, though covered with plaster.

In conclusion, I may say that my book scarcely aims at elaborate architectural *detail*, which might have been destructive of artistic effect; and is intended rather to give the *spirit* of the buildings which it represents.—I am, &c.,
Halifax, July 31st. JOHN LEYLAND.

NEW WESLEYAN SCHOOL AT TRURO.

SIR,—In your impression of last week, with reference to the new Cornish Wesleyan Middle-class School about to be erected at Truro, you state that the architect for the above building is Mr. Edward Kendall, of Truro. This gentleman is the much esteemed secretary to the association. The architect (the design of whom was selected in open competition) is—Yours, &c.,
ELLIOT J. ETTWELL.

West Bromwich, August 4.

CHIPS.

Mr. Stephen Isaacson Tucker, Rouge Croix Pursuivant of Arms, a well-known writer on archæological and genealogical questions, has been nominated by the Duke of Norfolk, hereditary Earl Marshall, to the patent office of Somerset Herald in Ordinary, so long held by the late Mr. J. R. Planché.

An iron church, erected by Messrs. Broad, contractors, of London, was opened at Bridport, on Tuesday.

The church of St. Peter-the-Less, in North-street, Chichester, is undergoing restoration. A new reredos has been erected as a memorial to the late rector, the Rev. Prebendary Brown, to whom a brass has also been laid in the chancel. The reredos is composed of patterned encaustic tiles, the central portion being of alabaster, with cross in gilt mosaic. The church is being reseated, the pulpit and reading-desk have been rearranged, and a vestry is being added. Mr. Gordon M. Hills is the architect, and the work has been carried out by Mr. F. M. Vick, builder, of Chichester.

Intercommunication.

◆◆◆

QUESTIONS.

[6184.] — **Wall-Linings.** — Would some of your readers be kind enough to give me full information as to the best kind of tiles for wall-linings, with prices, mode of laying, references to writings on the subject, &c.—Ignoramus.

[6185.]—**Preservation of Stone.**—Will some correspondent give me his practical experience of the efficacy of any stone-preserving process? What is the present state of the portions of the Houses of Parliament which were experimented upon some years ago, I believe, by different processes? Oil is apparently being largely used to the new masonry during the repairs to York Minster, under Mr. Street. I have understood that oil is not more permanent in its effects than painting, and requires renewal similarly. Can anyone throw light on this question from actual experience?—One in Doubt.

[6186.]—**Railway Companies and the Value of Land.**—A railway was made some 20 years since through an estate running along the sides of and near the bottom of a hill, which is loaded with large quantities of green sands, through which the head water above percolates. In making this railway those green sands were cut into from 15 to 20ft. in depth, for a length of nearly a quarter of a mile, and the consequence is that those sands have been constantly running out ever since to a very considerable extent, and in all probability will continue so for years to come. The result has been that as those sands discharge themselves from the bowels of the earth a vacuum is thus formed, and after a while the upper strata or top crust breaks away and settles down, and so very materially interferes with the cropping of the land and the vegetation thereon, as well as destroying several orchards of a thriving and excellent kind. An action was recently brought against the company for compensation for the damage so done to the lands by the landowner. The damages were set by the landowner's surveyor at so much, based as follows: — The *original* agricultural annual value of those portions where the slips and subsidences had taken place, having been put at what they were fairly worth had no disturbance of such lands occurred, at the usual 30 years' purchase for the fee simple thereof. Against this the present value was obtained by taking the same portions of lands at what they were considered worth for agricultural purposes at the present moment per annum, and the value in fee of the same reckoned at from 13 years' to 22 years' purchase, according to the nature and dangerous state thereof. The railway company's surveyor objected to this mode of computing the value of the alleged damage as made by the landowners' surveyor, on the ground that it was inconsistent, and an unknown basis to go upon. That having reduced the agricultural value in the first instance, the landlord's surveyor had no right to lessen the years' purchase also thereon. The landowners' surveyor contended that inasmuch as those affected portions of land were not stationary but movable, and in a running-away state, they ought to be treated more like house-property than otherwise. It would be a matter of great satisfaction to have the opinion of some of your readers, being experienced land surveyors, on this matter as to which of these two surveyors may be considered correct in his theory.—R. C.

[6187.]—**Measuring Old Gothic Work.**—Would any one kindly inform me if any small guide to measuring old Gothic work has ever been named in the "Intercommunication" column, or elsewhere, that would assist me in making measured drawings of an old abbey, with probable materials, drawings, paper, &c., required for such work?—Chas. G. Killmister.

[6188.]—**Making Black Bricks.**—Is there any cheap and easy way of making black bricks out of red ones? Would making the bricks hot and dipping them in coal tar answer the purpose and stand the weather?—J. Sparrow, Napier, N.Z.

[6189.]—**Fifteenth-Century Dr. Tanners.**—In the church of St. Mary, at Bury St. Edmund's, I am told, is an altar-tomb surmounted by a recumbent figure of a starved man, the details of which are well executed and ghastly enough. It was erected to the memory of John Baret, who died of starvation in 1463, while attempting to fast forty days and forty nights. Have any of your readers ever sketched this monument; if so, perhaps you would publish it?—L. R. D.

[6190.]—**Footings of Tank.**—What kind of bond is best for footings of a large brick circular tank, 40ft. diameter? Four courses of footings three bricks thick. Is all header the best or quickest?—G. C.

[6191.]—**Imitating White Marble.**—I have a large white marble ornament broken into a number of pieces, and wish to join them together again, but having lost some small pieces I want to know if there is some kind of composition I could get to imitate white marble.—Middlesex.

[6192.]—**Spring to Close Church Door.**—I want to make a heavy door of an old church in a poor parish self-closing. Can any of our many intelligent readers help me to do so? I would have them bear in mind 'tis a heavy door, swinging on rides about ⅝ths of an inch thick, and this simply on hooks leaded almost beyond hope of removal in stonework. There are two steps of stone at doorway, and the door shuts against the face of one of them about 2in. down it, so that a spring at bottom of door won't apply. The old rides are necessarily so fixed that it is almost impossible to introduce rising butts, and to obtain the effect by pulley and cord is objectionable on account of noise they make in working.—T. R. P.

REPLIES.

[6167.]—**Pitch for Tile Roof.**—To insure water being kept out, the pitch should not be less than an angle of 45 degrees.—C. F. M.

[6180.]—**Brittany.**—I have just returned from an architectural tour in Brittany, and had with me Murray's "Handbook to France," and found it all that I could desire in regard to architectural features. I had also a Bradshaw's "Continental Guide," but the former was by far better for any one interested in architecture.—Chas. Mason.

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LEGAL INTELLIGENCE.

A Builders' Partnership Dispute.—Rogers *v.* Manley.—On Tuesday Vice Chancellor Malins gave judgment in this case reported in our issue of June 11. His Lordship said the plaintiff and defendant entered into partnership together as builders and contractors in the year 1859. Their business was carried on in St. George's-road, Camden-town, and the partnership was dissolved in August, 1878, under circumstances to which he would more particularly advert. The question in this action was as to the rights of the plaintiff under that dissolution. It appeared that the plaintiff and defendant had commenced life as journeymen carpenters, and were friends and companions together. The partnership which they entered into became eminently successful and was carried on in a most honourable manner and with great kindness to each other, for they both agreed in stating that no difference had ever taken place between them till the occasion which gave rise to this action. It was provided by the articles of partnership of the 21st of May, 1862, that annual accounts of the partnership affairs should be taken, and that appeared to have been adhered to. The balance-sheet from 1875 to 1877 showed a large surplus over debts and liabilities. That of 1875 amounted to £66,000, and the consequence was that a large property, consisting principally of houses and shops, was divided between them. In 1876 the surplus was £32,000, and in 1877 it was £31,977. That account was signed by both partners in April, 1879. In consequence of a strike in the building trade and general depression, the business profits in 1878 were considerably diminished; so that, while the wages paid in 1877 averaged £400 a week, they were reduced to £200 in 1878. In this state of affairs the plaintiff fell into bad health in the summer of 1878; he was certainly unwell nearly if not the whole of July; and upon the evidence his Lordship was satisfied that in the early part of August in that year he was in a serious state produced by want of sleep, which rendered him incapable of conducting business; and in consequence of this state of health he suddenly became possessed of an overwhelming desire to retire from business. It was on the 19th of August that the first transaction took place which was brought in question in this action. The plaintiff's account was that on that day, after his visit with Mr. Manley to Dr. Burnett, he went home and lay down on the sofa for the rest of the day till about half-past 6, when he went to the office. The defendant's account was that, on the contrary, the plantiff returned to the office and they spent the afternoon in looking into the accounts, and the result was that they both determined to sell the whole concern and go out of business. The plaintiff swore that, having gone to the office at half-past 6, they both walked on Primrose-hill for about two hours, and the result of the conversation they then had was that the plaintiff should retire from business, and that the defendant should give him one-third of the value of the surplus assets of the partnership. The defendant denied this and said that the plaintiff came to the office at half-past 8, the next morning, and made a proposal to him that he (the defendant) should give the plaintiff 11 houses then lately built by the firm and which had been transferred to him as his private property, and should indemnify the plaintiff against any further liability of the partnership business, and that as these houses were of greater value than one-third of the assets of the firm the plaintiff should transfer to him a sum of £2,000 then standing in his name in the public funds. His Lordship found it quite impossible to reconcile these conflicting statements, but, having very carefully considered the evidence on each side, he had come to the conclusion that the plaintiff's statement of the result of the negotiations was the correct one, and that it was agreed between the plaintiff and defendant that the latter should take the business upon the terms of paying the plaintiff in money or money's worth one-third of the value of the surplus assets of the partnership. The parties having come to an agreement to dissolve, it was the common case between them that they went on the morning of the 20th to the office of their solicitors and there saw Mr. Whitfield. They then told him what they had agreed upon, and a deed of dissolution of partnership was prepared and executed the very same day, by which the plaintiff released to the defendant all his interest in the business, and the defendant agreed to assign over to the plaintiff all his interest in the 11 houses, and the plaintiff was to transfer to the defendant the sum of £2,000 Consols. After this transaction was carried out the plaintiff left town for several months and his health became restored, and when he returned he was dissatisfied with the arrangement come to, and upon looking into the books he complained to the defendant that he had not been fairly dealt by, and that, instead of getting one third of the assets, he had not received more than one-sixth part, and he required a further payment to be made to him. This the defendant resisted, and contended that the plaintiff had received all he was entitled to, and more even, because the value of the houses was greater than the sum he had fixed. This dispute led to the present action, which had been heard at great length, and his Lordship's opinion upon the evidence was that the plaintiff's statement was the correct version of the contract, and that he was not in such a state of mind on the 20th of August as to be capable of entering into such an arrangement: and, further, that the defendant ought not to have allowed the business to be concluded in such haste. Being of opinion, however, that the plaintiff was entitled to one-third of the assets of the business, the only question was whether he had, in fact, received that amount. The plaintiff's strict right would be to have the value of the assets taken as they were on the 20th of August, 1878, and to have the difference, if any, made good to him: but, after going through the evidence which had been given as to the value of such assets, he came to the conclusion that the plaintiff would have had about the value of one-third of the assets if he had not paid to the defendant the £2,000 Consols, and if that sum had not been so paid there would have been no justification for this action. It was clear from the evidence of Mr. Whitfield, the solicitor, that the plaintiff was from the first dissatisfied at having to pay that sum, and this opinion his Lordship had expressed during the hearing of the case. He could not help feeling great regret that this dispute had arisen between two persons who had been so long connected in business and who had acted with such kindness and good faith towards each other during their partnership. With a view to some compromise being effected he had ordered the case to stand over for a fortnight, and at the end of that time the defendant had expressed his willingness to submit to a decree to the effect he had himself suggested—namely, that the defendant should return the £2,000 Consols to the plaintiff and pay the costs of this action. The plaintiff had declined to accept that offer; but as the offer, in his Lordship's opinion, would meet the justice of the case, the decree would be in accordance with it. He felt satisfied that if the alternative course was adopted of having an inquiry in Chambers, it would cause great delay and expense and would not in the end produce a more favourable result for the plaintiff. He considered that he was consulting the best interests of both the plaintiff and the defendant in refusing to order a reference to Chambers, and in making the decree he had stated.

The Brickmaking Season.—At the Brighton county-court, on Friday, the action of Goatcher v. Clayton was heard, this being one to recover £5 13s., alleged to be due on a contract by the defendant to make bricks. Plaintiff deposed that he contracted to make bricks for the defendant at 6s. per 1,000. He made 226,000, and upon that number 6d. per 1,000 was kept back to recoup defendant for any damage which might be caused to the bricks. He entered into no contract to make bricks throughout the season. When he had made the number mentioned he told defendant that the clay was very hard to work, and asked for 3d. per 1,000 extra, which defendant refused to pay. The defence was, that the plaintiff agreed to make bricks for the whole of the season, and as he had not done so the 6d. per 1,000 had been forfeited. Defendant's son said the contract, which was in writing, was read over to plaintiff, and was that plaintiff should make bricks throughout the season; the custom was, if men left before the brickmaking season was over, they forfeited the 6d. The judge (Mr. Martineau) did not consider the plaintiff was entitled to claim the 6d. per 1,000 before the end of the season, and perhaps not then, and he therefore dismissed the case.

Notice to Adjoining Owner to appoint a Surveyor.—Wadd v. Croll.—This was a motion heard before the Master of the Rolls, on Wednesday last, to restrain defendants from acting under an award to pull down a certain party-wall, situate in Basinghall-street, City, on the ground that a proper notice had not been served on the plaintiff requiring her to appoint a surveyor to act for her. Defendant had given the usual three months' notice, on the form authorised by the Board of Works, and had also written plaintiff, saying he "should be obliged" if she would appoint a surveyor; but she having failed to do this, he proceeded to appoint a surveyor for her, under Section 85, sub-section 9, of the Building Act, and the two surveyors so appointed had appointed a third surveyor. The three surveyors awarded that the wall should be pulled down, but the plaintiff moved to restrain defendant from doing so. Mr. Karslake, who appeared for the defendant, contended that three months' notice first served required the plaintiff to appoint a surveyor, and he showed by an affidavit that no other form for doing so had been issued by the Board of Works.

Sir G. Jessel said that the "three months'" notice contained no requirement of the plaintiff to appoint a surveyor, and the letter was insufficient, as it did not require the plaintiff to do so, but simply said that the defendant "would be obliged" if it were done. He granted the injunction, on that ground; but reserved the question of costs.

A Prima Donna and her Builder.—Heard v. Patti.—At the Glamorganshire Assizes, on Tuesday, the following case came before Lord Justice Thesiger in the Nisi Prius Court. Mr. M'Intyre, Q.C., and Mr. Jeffreys were for plaintiff, and Mr. Bowen, Q.C., and Mr. Percy Gye (specially retained from the South-Eastern Circuit) for the defendant. Mr. Jeffreys, in opening the pleadings, stated that the Marquise de Caux, the defendant, employed Joseph Cook Rees to do certain additions and buildings to her house, Craig-y-Nos Castle. Rees did work to the amount of £14,000, and on the 18th of May, 1880, defendant was indebted to him in the sum of £2,500. This sum Rees assigned to Heard, the plaintiff. Defendant had notice of the assignment, and was frequently requested to pay this amount, but she had not done so. She stated that the employment was according to contract, that she had paid £8,435, and that no further work had been done. She also stated that the £2,500 claimed for additions had not been ascertained by admeasurement to be due, and the amount was not payable until three months after the completion of the whole work. She further denied the assignment of the debt by Rees, and set up a counter claim under an agreement of the 18th of March, 1880, by which Rees undertook to finish the buildings by the 4th of April, or to pay a certain sum per day if they were not completed by that time. Mr. M'Intyre opened the case. He said plaintiff was a timber merchant carrying on a large business at Swansea, and defendant was the well-known singer, Madame Adelina Patti. Madame Patti purchased an old house in Breconshire, near Ystalyfera, which she found to be inconveniently arranged and not sufficiently large. She therefore determined to have the whole house reconstructed, and a gentleman named Peck, of 29, Gray's Inn-square, on her behalf, entered into a contract with Rees to do certain works for £4,250, and there were in the contract provisions with respect to extra works, and as to the terms on which money was to be paid both for the contract and the extras. Mr. Peck was to entirely control the work, and be the sole judge of any dispute which might arise. Rees commenced the work, and alteration after alteration was made in the buildings by the defendant. The work went on, and payments amounting to £14,385 were made on certificates given by the architect of the actual work done. Defendant had paid £8,535 on the contract work, which was a sum vastly in excess of the contract price. On March 18, Mr. Herbert Gye appeared on the scene, armed with a letter from Madame Patti, and superseded Mr. Peck. Mr. Gye was dissatisfied with the work, and seemed to dispute the amounts which had already been settled. The work was so much greater than Mr. Rees had expected that he borrowed money from Mr. Heard, who also supplied him with a quantity of material. Rees gave Heard a cheque upon the sums of money which would become due to him, and in March, 1880, a sum of £2,000 was paid over by Mr. Gye to Heard. Mr. Bowen, for the defendant, said he had never seen the assignment, and he wanted it proved. Then he disputed the items in the charge of £5,900, and under the agreement of the 18th of March, 1880, defendant claimed £3 3s. per day for the delay in completing the work. The work should have been completed by the 4th of April, whereas it was not finished until about the 18th of June. The learned Judge said that if the items of the account were disputed, it would be best to bring in Rees as a party to the action. The counsel on both sides agreed, and his lordship discharged the jury and referred the question of fact to the arbitration of Mr. Arthur Lewis, the legal queries being left to the consideration of the judge in London.

WATER SUPPLY AND SANITARY MATTERS.

The Water Supply of London.—The Select Committee appointed to consider the question of the water supply of the metropolis on Tuesday agreed upon their report. This will be found to recommend the creation of a Water Trust, to be elected from the Corporation of the City of London, the Metropolitan Board of Works, and the other bodies representing water districts outside the jurisdiction of these corporations. The Committee arrive at the conclusion that "the "agreements" with the water companies accepted as a basis of Sir Richard Cross's scheme for the purchase of the existing water-works should be placed out of court. They do not oppose the purchase of the water-works upon reasonable terms, but suggest that favourable consideration should be given to the possibility of obtaining a supply from other sources. This, however, is a matter that will be left entirely to the proposed Water Trust, which will be created by Act of Parliament.

STAINED GLASS.

Houghton.—A three-light window has just been placed in Houghton Church, Walsingham, Norfolk, the subject being, in the centre, "The Crucifixion," and in the side-lights the figures of "The Blessed Virgin" and "St. John." The window is treated in an emblematic manner on a rich ruby background, with leaded conventional foliage, and was executed by Messrs. Gibbs and Howard.

CHIPS.

The Congregational Chapel at Lewes was reopened on Wednesday week after renovation and improvement, and the provision of additional Sunday-school accommodation. The works have been carried out by Mr. H. Hoey, under the superintendence and from the designs of Mr. H. C. Card, of Lewes.

The local board of Fulwood, near Preston, adopted on Saturday plans for new works of water supply, including seven miles of pipes and mains, and a water tower and tank 75ft. in height, and estimated to cost £13,000.

Preparations are being made by Messrs. Holme and King, railway contractors, of Liverpool and Wigan, to lower the Sough-tunnel, near Darwen. The bed of the tunnel is of solid rock, and is over 2,000 yards long, and this is to be lowered 3ft. The work will extend over six months, and from 150 to 200 men will be employed in shifts night and day.

New works and extensions are being carried out at the Cambridge gasworks, from the designs of Mr. John Hawkesley, C.E., of London; the estimated cost is £10,000.

A report has been made by Mr. A. M. Blomfield, M.A., on the condition of the church tower at St. Neot's, Hunts.

The new Fisherlads' Institute at Grimsby was opened on Tuesday week. The building stands at the corner of Tomline and Orwell-streets, on a site granted at a nominal rent, by Col. Geo. Tomline, of Orwell Park, Ipswich. It is built of red brick with stone dressings, and contains reading-room, library, lecture-room, refreshment-room, and class-rooms, and attached are a large swimming and several private baths. A residence is provided for the agent, and a cottage for the bathman. Mr. Charles Bell, of London, is the architect, and the contractors are Messrs. Riggal and Hewins, of Grimsby.

The new Central Station of the Midland Railway Company at Manchester was opened for main line traffic on Monday. The roof has been erected by Messrs. Handyside, of the Britannia foundry, Derby; its chief dimensions are—span 210ft., height from platform to crown of arch 84ft., length 548ft.

The Cleveland Institution of Engineers visited West Hartlepool on Thursday in last week for the purpose of inspecting the new docks and warehouses. They were met by Mr. Charles Harrison, C.E., the engineer to the North-Eastern Railway Company, who explained the details of construction and stated that the total area of the new docks is 34 acres; the length is 1,000ft., the entrances are each 60ft. wide, and the cost of stone and brickwork has been £680,000. New warehouses, just contracted to be built, at an outlay of £34,000, were also visited, and also the new pier works in progress for the port commissioners, and several engine-works and shipbuilding-yards.

On the 29th ult., the Bishop of Ripon consecrated the newly-erected church at Killinghall, near Harrogate. The church, which is dedicated to St. Thomas, is built in the style of the Second Pointed or Geometrical Decorated period. The works have been carried out from the drawing of Mr. Swinden Barber, F.R.I.B.A., Halifax. The cost is about £3,000.

The Liverpool City Council on Wednesday adopted a recommendation of the finance committee that, having regard to the long and faithful service for upwards of 35 years of the deputy corporation surveyor, Mr. George H. Rollet, he be relieved of the more active and responsible duties of his office, and that be be retained upon the staff at £300 per annum, being two-thirds of his present salary, with the understanding that he affords the committee when called upon any information or assistance they may require from him. The committee further recommended that Mr. F. T. Tarton, surveying assistant, be appointed assistant deputy corporation surveyor at a salary of £350 per annum.

Our Office Table.

Dr. Richardson proposes to bring the seaside itself—not merely sea-water—to London. His plan is to get enough sea-water and to make spray fountains of it in every garden, every house, every close court, and every alley. The poorest creature will be able to feel the invigorating salt spray upon his cheek as easily as if he stood on Brighton pier or walked on the sands at Trouville. Dr. Richardson wants to have a royal commission to investigate the subject. Dr. Richardson gives no estimate as to cost, and really as far as can be seen at present, however it may be in the future in Hygeia and Salut-land, little probability exists that the Doctor's project will be realised.

At the approaching Social Science Congress to be held in Edinburgh, the subjects for discussion in the Health Department are:—1. What are the best areas for sanitary purposes, and how far should there be a revision of the mode of electing and continuing the services of the officers under the Public Health Acts? 2. What is the best mode of amending the present laws with reference to existing buildings, and also of improving their sanitary condition so as to render them more healthy, having due regard to economical considerations? 3. What are the means which should be adopted for the prevention of the pollution of streams, without undue interference with industrial operations, and for the preservation of pure sources of water supply? And in the Art Department:—1. Ought there to be a school of dramatic art subsidised by private subscription or endowment, or by the State? 2. How far would the revival of the old system of "masters and pupils" be of advantage, and tend to promote the growth of historical art in the country, and the fitting use of painting and sculpture in our public buildings? 3. How can the musical education of the middle classes be improved?

At the last meeting of the rural sanitary authority of West Ward, Westmoreland, held on Wednesday week, a report was presented by the works committee on the drainage works recently carried out at the workhouse, in which the committee said they had no words at their disposal to express sufficiently their opinion of the disgraceful manner in which "a pretence had been made to carry out the original contract"; they suggested that the clerk of works, who received £2 per week to supervise, should be asked to give explanations to the board. A letter was read from Mr. Sarginson, the clerk of works, throwing blame upon Pattinson, the contractor. The chairman of the board said the clerk of works had actually allowed the whole of the sewage-pipes to be placed above the soft-water pipes; if he had attended to his work properly he must have seen such shameful work as had been revealed. Mr. Sarginson was then called before the board, and gave a lengthy explanation of his conduct, and after some discussion the committee's report was adopted.

A simpler and cheaper method than the use of oil for preventing the evaporation of water in traps is, according to a correspondent of the *American Architect*, to fill the trap with a saturated solution of calcium chloride. This material is a by-product in the alkali trade, for which, in quantity, the manufacturers would doubtless be glad to find a market at five cents a pound. Owing to its hygroscopic character its solution does not evaporate. About five pounds to a gallon is sufficient. To apply it to a water-closet, flush the trap thoroughly, shut off the supply, lift the handle, and drop the calcium chloride into the trap until no more will dissolve. For smaller traps, as in sinks and hand basins, where a slight waste is unimportant, pour in the saturated solution, which, being about twice as heavy as the water, will speedily, displace it. The calcium chloride may possibly contain a little free hydrochloric acid, which will corrode the metal. Its presence in the solution can be detected by litmus-paper, and a teaspoonful of marble dust will neutralise all that can be found in several gallons.

The summer meeting of the Institute of Mechanical Engineers was opened at Barrow-in-Furness on Tuesday, when there were present between two and three hundred members. Mr. Edward A. Cooper, London, the President, was in the chair. After the transaction of formal business, the President gave an address in which he referred briefly to the progress made by mechanical engineering, and called attention to the various matters which pressed themselves very urgently on their notice at the present time, such as the general depression in trade, which has now held its dull course for years; and secondly, the means in our power which were or were not being taken advantage of to promote the manufactures and commerce of the country. Subsequently, Mr. F. C. Stileman read a paper on the railway and dock approaches of Barrow. The scheme of docks at Barrow was discussed, and the author of the paper described the many natural advantages which the port possessed, and the satisfactory progress which had been made in the dredging operations, nature itself assisting very materially in the operation of scouring the channel or tide-way. Mr. Humphry then read a paper on the new steamship *City of Rome*. At one o'clock the members of the institute were entertained at lunch by the Mayor of Barrow, and in the afternoon several of the public works of the town were visited. In the evening a special excursion-train was run to Coniston, where the engineers were entertained to dinner by the Barrow Shipbuilding Company and other firms.

At a meeting of the Rotherhithe Vestry last evening, a report was brought up for the special committee appointed to consider the circumstances of the death, from scarlatina, of a child in Queen-street, Rotherhithe. The committee, in their report, stated that they had made a personal investigation of some of the houses in Queen-street, and had found the number of people who lived in them to be as follows:—No. 1, nine persons; No. 2, fifteen persons; No. 3, fourteen persons; No. 4, seventeen persons; No. 5, twenty-two persons; No. 6, eleven persons, two rooms being unlet; and No. 7, nineteen persons. The committee were of opinion that the foregoing houses were unfit for human habitation unless lime-whitened and cleansed, and traps provided for the drains in the back yards.—Mr. Stevens thought the disclosures made that evening would seem to make it advisible that the Vestry should memorialise the Metropolitan Board to obtain improved artisans' dwellings.—Mr. Walker said that the squalor and dirt in this street were something hideous, the children being in many instances covered with vermin.—After remarks from other gentlemen, Dr. Browning asserted that there was no overcrowding in Queen-street in the legal sense of the word—that was to say, there was no instances where any single inhabitant had less than 200 cubic feet of space allotted him or her.—Finally, the Vestry resolved to call the attention of the owners to the condition of the houses. It should be stated that the houses are by no means large buildings, and their condition, as well as that of the inhabitants, is most wretched.

An interesting work has been recently published by Herr Funk, of Cologne, giving the results of a long experience on different German lines, as to the duration of railway sleepers, of ordinary or prepared wood. Chloride of zinc, sulphate of copper, and creosote, are the substances chiefly used to impregnate the wood; corrosive sublimate is also employed, but the high cost forbids its general use. The substance found most suitable is chloride of zinc,—considerably cheaper than creosote,—it produces equally durable sleepers. (Sulphate of copper is being generally abandoned, as a difficult and costly means.) The average duration of 831,347 pine sleepers, subjected to various processes of injection, was 14 years. The durability of oak is increased, by injection, from 13·6 to 19·6 years; pine, from 7·2 to 15; fir, from 5·1 to 9; beech, from 3 to 16·5. It will be seen that while non-prepared oak has great superiority, the injected pine and beech are more durable. Injection under strong pressure is practised in Germany.

At the opening of the Fine Art Exhibition, in Glasgow, on Tuesday, Professor Baldwin Brown spoke on the different characteristics of the English and French artistic schools. He said it appeared to him that these schools had a good deal to learn from one another. Any who had cast their eyes around the walls of the room in which they were would see some of the most characteristic excellences of the English school represented by the colour, the sentiment, and the feeling in the works of Chalmers, and the breeziness, the open-air feeling—especially in the skies—in the works of Bough. These were things in which, he thought, we surpassed our neighbours on the other side of the Channel; and he believed they felt that, and were ready to recognise it, as was the case after the exhibition of 1878. At the same time, in other most important points the English school had very much to learn from them. He thought there could be no doubt that, without going into any technical details, the French generally might be said to surpass us in drawing and perspective, and in the art of making the objects they were dealing with look solid. Now, the feeling of beauty and nature in the English school would be none the worse for a little solid backbone of drawing and perspective underneath it, and there was no method by which we could learn it better than by studying the works of French painters and draughtsmen.

In the *Contemporary* for the present month the Rev. Barham Zincke makes a double attack on the Land Laws that tie up property in the rural districts, and on the urban leasehold system, which he denounces with unsparing severity. In Switzerland it is difficult to find a family residing in a house which is not its own property; the heads of 465,000 householders out of a total of 556,000 are owners of land; and, in some cantons, a man cannot contract a legal marriage until he has at least a site for a house of his own. Need it be added that the Swiss, poor though they are reckoned, are far better housed than the Englishman? Mr. Zincke goes even so far as to say that, "beyond controversy, London stands below all the capitals of the civilised world in the meanness of its houses;" and he attributes this mainly to the miserable system of one man building a house only to let it to somebody else, on a third man's land. To his other complaints against the urban leasehold system, remarks the *Echo*, Mr. Zincke might have added that it enables the landowners to escape from local and imperial burdens which press so heavily upon smaller men. Mr. Gladstone called attention to that point just before the last Election, and as he always redeems his promises, we may expect to hear more of it before very long.

A French engineer, M. Bouilliant, has invented and perfected several models of bridges which require for their construction nothing more than such undressed woods as may be found anywhere. They may be put together and taken apart again in a few hours. The girders supporting the platform are sustained by three cross-girders; and the latter are supported by a truss composed of poles tied together diagonally. The whole truss is firmly braced. These bridges may be constructed entirely of wood, if there be wood at hand capable of furnishing material for tying; of wood and rope, or of wood and iron wire. Finally, they may be constructed still more solidly by means of a device invented by M. Bouilliant, and called a "put-log fastening." This fastening, which may be also used for many other purposes, such as the construction of scaffolding, &c., is composed of a chain to surround the ends of the pieces to be joined, and a nut. The nut is provided with an eye, to which is attached one of the end links of the chain, and a hook to which may be attached any other link that may be desired. The nut is traversed by a screw having at the upper extremity a lever, and at the lower a small metal plate.

At the meeting of the Devonshire Association for the Advancement of Science, Literature, and Art, held on Tuesday week at Totnes, Mr. E. Appleton, F.R.I.B.A., read a notice of a wooden effigy found at Dartmouth in 1879. It was discovered in taking down a house near the Church, where it served as a lintel of a back window. It was made of chestnut, was 5ft. 2in. in height, and represented a mitred bishop, with alb, cope, and stole, but the hands and feet were gone. The date of the house was 1680, but doubtless the figure was much older than that, and was probably an effigy on a tomb, of about the fifteenth century in origin. The effigy, which was exhibited, belonged to Mr. Cranford, of Dartmouth. Mr. Pengelly suggested that the effigy was a figure-head of some ship, but this idea was not widely accepted during the brief discussion which followed.

A Committee is at present engaged in New York in drawing out rules for the proper sanitary arrangements of houses, and in deliberating how far it would be proper for the board of health to dictate details of construction. The following rules have been agreed upon:—All soil-pipes to be of iron. All soil-pipes to be accessible throughout their entire length for inspection. All soil-pipes to extend through the roof, and to be of undiminished calibre. All sewer-pipes to be of iron. That sewer-pipes be above the cellar floor, and not buried. That all joints in sewer and soil-pipes be gas and water tight, and that they be caulked with either lead or with iron filings and sal ammoniac cement. That traps be provided for all basins, sinks, and bath-tubs. That all traps be ventilated by special pipes through the roof. That there be no traps on vertical soil-pipes; upon the important question of the expediency of placing traps between houses and the street sewers, considerable divergency was manifested in the views of the sanitary authorities of New York.

The United States Potters' Association, at its last annual convention, resolved that a reward of 500 dols. be and is hereby offered to any person who may invent and offer to us any new and useful machinery of importance to us, applicable to our art and business, and that a reward of 250 dols. be and is hereby offered by us to any person who may invent any essential and useful improvement to or upon any machinery now in use by us. Provided, that these inventions or improvements are free from all patents obtained, or to be obtained, from the inventor or any other person. All communications relating to machinery and rewards should be made to Messrs. Thomas C. Smith, Greenpoint, N.Y.; John Moses, Trenton, N.J.; M. Tempest, Cincinnati, O.

At the Auction Mart, on Wednesday, a sale of a very special character was held by Messrs. Edwin Fox and Bousfield, acting on the instructions of the Home Secretary and Prison Commissioners, and of the county authority for Middlesex. The property offered comprehended the six prisons for Bath, Wisbech, Bury St. Edmund's, Southwell, Mold, and Beverley, which were described as freehold estates now available for building, being no longer required for their original purpose, in consequence of the alterations effected in the administration of justice under the Prison Act of 1877. They comprise altogether about 17½ acres, were offered in six lots, and the total amount at which the lots were knocked down was £17,850. The principal lots were sold. The barracks situate at Hampstead, not now wanted for Militia purposes, in consequence of the head-quarters being removed to the depôt under Lord Cardwell's organisation scheme, comprised about one acre of land suitable for building, and were sold for £5,500.

CHIPS.

The directors of the Crystal Palace propose to start a series of annual international exhibitions, each one to be limited to one class of articles. The first exhibition, of wool and woollen goods, &c., takes place next year.

A fine building estate near Crawford College, Maidenhead, is now being laid out, and several first-class residences are about to be erected, commanding splendid views of the Thames Valley, Cliefden Woods, Taplow, &c. The houses will be of red brick, covered with tiles. Terra-cotta, manufactured about a mile and a half from the site by Messrs. J. K. Cooper and Son, will be largely used in the external dressings and enrichments, the houses alternating with red or buff material, and as the estate has been planted about 15 years with ornamental trees and shrubs, the grounds to each house will be in mature condition as soon as the houses are ready for occupation. Messrs. Brown and Albury, of Reading, are the architects.

A Local Government Board inquiry was held at Bacup last week by Capt. R. F. C. Hildyard on an application from the Bacup sanitary authority to borrow the sum of £1,900 for street improvements in connection with a new bridge over the river Irwell. The plans were produced and explained by Mr. John Wilson, C.E., surveyor to the Board, who also furnished the inspector with particulars respecting the population, rateable value, and water supply of the district. Mr. Jno. Haworth, of Lancaster, objected to part of the scheme.

Messrs. H. Saxon Snell and Son have been requested to prepare a design for the new Royal Samaritan Free Hospital, on the site of Dorset House, St. Marylebone.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 13, 1880.

BUILDERS' EXTRAS.

A CASE of more than ordinary interest to the public, the architect, and the builder, will be found recorded in our Legal Intelligence of last week. It was an action brought against Adelina Patti, the well-known operatic singer, by the assignee of a Welsh builder of the name of Rees, for builders' extras, and which came before Mr. Justice Thesiger, at the Glamorganshire Assizes. Owing to the very complex nature of the evidence, the judge very properly suggested a reference to arbitration, nor would it have been possible for an ordinary jury to have come to a decision. From the imperfect report of the evidence already given, from which no definite conclusion can be drawn, the sum for the "extras" looks enormous, and out of all proportion to the contract price; yet those who are acquainted with building operations, and the difficulties attending the alteration of an old house, well know how quickly a bill of extras may be incurred, and that without any fault either of architect, builder, or proprietor. Difficulties occur at the threshold. As the very materials get taken down, unforeseen decay appears, and numerous improvements suggest themselves. The alterations to Madame Patti's house seems to have assumed the proportions of a rebuilding, while only a small part of the old structure remained. It appears that the defendant employed Mr. Joseph Cook Rees, a builder, to make certain additions to her residence, a small castle known as Craig-y-Nos, in the county of Breconshire. The old castle was inconvenient and small, and the defendant, through her agent, Mr. Peck, of 29, Gray's Inn-square, entered into a contract with Mr. Rees, bywhich the latter engaged to do certain work for the sum of £4,250. Under the contract, certain provisions were made for extra works, and as to the terms by which these were to be paid for; though what these terms really were we have not heard, beyond the condition that no "extras" were to be performed without Mr. Peck's written order. The work, which consisted under the contract of the addition of two wings, and other buildings, besides stables, was ultimately completed, and a bill sent in for extras, which considerably exceeded the contract sum, the total claim being over £14,000. The defendant paid £8,435 into court, and refused to pay more, and the action was brought to recover the sum of £2,500, which, it appears, had been assigned by Rees to the plaintiff (Mr. Heard), a timber-merchant, who supplied him with material. These are the main facts of the case as they appear. The pleas urged in defence seem plausible enough, while the counter-claim set up by the defendant, under an agreement made last March, by which Rees undertook to finish the work by a certain date, or in default pay a certain fine per day, would appear to be a cogent answer to the claim. On the other side, it appears from the evidence, and was uncontradicted at the trial, that constant alterations were made by the defendant herself (which, if true, would go a long way to upset any agreement that had been entered into), and various payments were made. Then we find that Mr. Peck, a gentleman who appears to have acted in the capacity of architect, was to become sole arbitrator in case of dispute. Payments were made on his certificates to a certain amount, when a Mr. Herbert Gye was appointed by the defendant to supersede him. This gentleman seems to have disputed much that had already been paid for; but we find a payment was made by him of £2,000 in March, to Heard. Looking at these rather conflicting facts, and in the absence of further definite details, we are at some loss to see on what ground a refusal to pay the balance is made. If a builder gets the architect's final certificate, he can generally defy the employer's threats, for in the eyes of the law it is tantamount to an acknowledgment of the debt. It may also be borne in mind that a stipulation in the contract to the effect that written orders must be given for extra work is superseded by a final certificate allowing such extra work, and such certificate has been ruled to be conclusive.

But the case is instructive not only to the architect and builder, but to the public in general, and we may now dwell upon a common misapprehension of the subject which has misled some of our daily contemporaries. In the minds of a great many people the word "extra" conveys the idea of money paid for things that should have been included in the contract, but were, by omission or neglect on the part of the architect or builder, left out. This definition is perfectly right so far as it goes, but the word "extras" is apt to be used ambiguously; it may mean, in fact, two very distinct sorts of extras. In the first place, it is frequently used to signify additions made by the employer, which are in no sense to be confounded with things omitted to be done under the contract, but which are absolutely essential to the completeness of a building. In another sense, and a more just one, it may mean the latter. But it ought to be clearly remembered that additions made by an order in writing, such as those probably were in the case we have mentioned, are no more extras than the addition of some rooms or offices to a house would be after it had been in occupation for years. Yet the public run away with the notion that whatever they may pay for as an *addition* to the contract is an extra, whether it is absolutely a matter of personal convenience or taste, or not; whereas the two things are quite distinct. It is very possible, and indeed it often happens, that these extras are incurred from the incapacity of the employer to clearly foresee and provide for what he really wants. Incompetency to understand plans and sections often leads to extras. When the house is in progress the employer discovers something different to what he expected; he perhaps discovers something missing, less height of room or width of passage, and he forthwith gives an order for the alteration or addition; but these variations cannot be laid to the charge of the architect; they arise from the want of previous knowledge on the part of the employer. They may even be suggested by the builder in the course of the work, or they may be introduced at the fancy of the owner; but in neither case can it be said they are due to omission or neglect in drawing up the specification. The readiness of the public to blame the builder or architect is not surprising, but the remark we have made will be sufficient to allay the feeling which such a letter as that published in the *Times*, and signed "A Householder," may create in the minds of many who have had some experience in bricks and mortar. It is, at least, an answer to the question put by "Householder"—"Why is it that no effort is sufficient to obtain accurate knowledge as to what will be the cost of building or repairing one's house?" The writer states his own experience attending the throwing out new windows in his drawing-room, and some alterations to his stabling. He says the estimate was £50, but the actual cost was about £100; but he carefully avoids mention of alterations made, or any additions which fancy or afterthought may have suggested. We are not told whether the account was disputed; it might have been grumbled at, but it was paid. Till we hear the facts on the other side, these public statements are misleading. The article, commenting on "A Householder's" experience, says that his "experience is that of thousands of others. He is evidently indignant that he cannot, with the exercise of ordinary care and intelligence, be sure what the building operations which he ordered will cost; that he may find himself many pounds out in his calculations, and that, nevertheless no one will be to blame." The *Times* is partly right in the conclusion: it plainly tells people not to be their own architect; but it does not guarantee, even with the aid of professional advice, that their interests will be adequately protected. It further asserts the architect is free to order what "extras" he likes. The article goes on to say: "There may be serious and expensive modifications of the plan as originally sanctioned; they may add enormously to the cost of the building; but, great or small, costly or cheap, the changes are extras, and they must be paid for by the employer, even if they double the original cost; and the architect will have his additional percentage on the cost of the extras which he has chosen to order without, in all probability, consulting his employer. No more honourable body of men than architects exist. But humanity is frail, even though it has the letters R.I.B.A. after it; as things are managed, there is a strong temptation not to look far ahead, not to estimate very nicely, and to lend a favourable ear to proposals that this or that extra should be allowed." The *Times* has rather overstated the case. It is not a fact that an architect can order what extras he likes, and no architect worth the name would be influenced by a consideration of his commission. The first precaution against all such misunderstandings is a carefully-drawn specification which every architect ought to be able to draw up; in fact, any omission on his part is a reflection on his competence. In this specification there should be a clause to the effect that no extra work is to be executed unless it be ordered in writing by the architect or client, as the case may be; and every such order, when presented to the contractor, should be considered incomplete without the rendering of a supplemental estimate on the part of the builder. The latter course is not generally followed, for the conditions usually contain a clause to the effect that all additions, omissions, or variations so ordered are to be measured and valued according to a schedule of prices annexed, and in cases of day-work, vouchers are delivered to the architect or clerk of works.

We cannot at present say, without knowing the special provisions of the contract, how far these remarks are applicable to the case defended by Madame Patti; we do not know how the clauses were drawn up: all we know is that no extras were to be executed without Mr. Peck's written order. It is also clear several orders for extras must have been given to bring the amount to the sum it has reached. The question, of course, may be: Were these orders given with Madame Patti's sanction? If they were (and we presume so), can the public be surprised to hear that the extras entirely swamped the contract? We presume, of course, that the extras were measured and valued according to a schedule, or at fair prices, and we must further believe that they were for things the specification did not contain. It was impossible for the jury at Swansea to investigate the intricacies of the builder's account without going minutely into the contract, as it is necessary to prove what is included in it in the first plan. It appears the extra work has been mixed up with the contract, though it is not clear whether separate agreements were entered into for its completion. Of course, such a complication of work, unless the original conditions embraced alterations, would prevent Madame Patti suing for penalties for non-completion, and the issue of the matter would be reduced simply to a question of a fair admeasurement of the work claimed for. The bare statement of the facts of the case are quite formidable enough, without the comments which have appeared in the columns of our contemporaries. It appears, indeed, almost impossible that a house contracted for to cost a little over £4,000 could actually cost nearly £10,000 more; but we must not be led away by the figures. For aught we know, the original plans may have been doubled; numerous alterations may have been made as the work proceeded, and the sum claimed may be for a residence that cannot be compared with the romantic but rickety old castle which the contractor undertook to restore under his original agreement.

THE REPORT OF THE WATER SUPPLY COMMITTEE.

THE report of the Select Committee on the Water Supply of London, of which we gave an abstract last week, and which has since been presented to the House of Commons, is fairly satisfactory as far as it goes, but does not, in our opinion, go far enough; and, moreover, lacks certain information which it might reasonably have been expected to supply. The committee, for instance, was directed to find out whether the claims of the water companies were well-founded on past legislation or not, but the committee has not troubled itself with the subject at all, nor with the cognate and equally important one embracing the powers under which the companies conduct their business. Mention is made, indeed, of "the improvident legislation of the past," and the intolerable state of things, so far as the public are concerned, which exists if the claims of the companies are capable of being maintained; but this has been a foregone conclusion long ago, and most people, we fancy, looked to the report of the committee for some information, which, if not reassuring, would at least have indicated in some degree the real nature of the bonds in which we are shackled by the water companies. Many more people, too, expected that Parliament would have been informed by the committee how far it might be desirable to limit the nature and extent of the present powers of the water companies to levy rates and rents. The revaluation for rating and taxing purposes which takes place this year, and of which the water companies are going to take the full advantage, was urged on Sir Richard Cross as a reason for hastening legislation. It is true the late Home Secretary invited the ratepayers to raise the question of the legality of the proposed increase in the law-courts, but those ratepayers who are not enamoured of the prospect of fighting such giant corporations single-handed, and who looked to the Select Committee—as we believe the majority of them did look—for indications of probable protection against the proposed extortion, will not unreasonably be disappointed. So much for what the Select Committee has not done; what it has accomplished is fairly satisfactory. It disposes once and for all of Sir Richard Cross's provisional agreements, and leaves the matter just where it was twelve months since, with the exception that a recommendation made long ago by similar Select Committees, for placing the whole of the London water supply under a single management, is revived as a temporary expedient "in the absence of any single municipal body to which these functions could be committed." Without venturing absolutely to describe the composition of such a body, the committee is of opinion that it should include members of the Corporation of London and the Metropolitan Board of Works, together with a due representation of the districts at present supplied by companies beyond the jurisdiction of the above-named public bodies—such as the Kent company, for instance, which supplies the best water brought to London, but also supplies it to towns so far from the metropolis as to render it very improbable that they would consent to be placed under the control of the City of London, the Board of Works, or any other purely metropolitan body. On such a representative body as the committee suggest should be formed, ought, in their opinion, to devolve the responsibility of determining questions affecting the source, nature, and price, of the Metropolitan water supply of the future. The recommendations of the committee with regard to the constitution of the proposed water authority are really of the vaguest possible description. "Various courses might be adopted." This we all knew long ago, but it was hoped that the committee might be able to indicate more definitely which course would probably be the best, and that Parliament might have been able to recommend to the newly-created Water Trust that course for adoption. If the first duty of the new authority is to be to "*maturely* examine" whether regulation of the existing companies as in the case of the gas supply, or the introduction of a fresh water supply altogether, or the purchase of the existing undertaking is preferable, we must bid farewell to any expectations of speedy deliverance from the tender mercies of the water companies or any hope of an improved supply. As a matter of fact, it is hardly fair to expect any Government, Liberal or Conservative, to risk its existence on a measure which is, after all, a local one—though the locality is so vast as to render its necessities far more imperative and important than many others of an imperial character. If London had, as it ought to have had long ago, a single governing body capable of dealing boldly and economically with such questions—subject, of course, to the final sanction or disapproval of Parliament—Londoners would not have had to be ashamed many times over of their position as regards gas, water, and a score of other matters compared with that enjoyed by the inhabitants of many a tenth-rate provincial town. London, however, has not, and will not, have just yet, such a governing body. If, therefore, the present Home Secretary, undeterred by the failure of his predecessor, sees his way to disregard the very permissive character of the Water Committee's recommendations, and with the advice of competent lawyers and engineers to formulate a new scheme for consideration next session, he would earn the gratitude of every Londoner—except, perchance, holders of water stock. The preliminary to the preparation of such a measure should be to ascertain exactly what the legal position of the water companies is, and then either to insist on compulsory purchase at fair terms, or, if this is found impossible, to go in at once for a fresh and independent supply. Practically, this last course must be adopted before many years elapse: it might almost as well be undertaken at once.

CHATEAUX OF THE LOIRE.

[WITH LITHO. ILLUSTRATIONS.]

By Edwin Seward, A.R.I.B A.

THIS paper is founded on some rough notes of a short tour in the South and West of France, which I made last summer.

We will suppose our route to commence at Bordeaux, and from that city we sail down the broad Garonne, 70 miles to its mouth in the Bay of Biscay. Green vineyards fringe the river-banks, and cover the level country as far as the eye can reach, giving place at intervals to the white-washed houses of villages and small towns, or to the rugged mass of a fortress, as at Blaye, where one of the green islands which are so frequent in the river, bears a grim burden of dark masonry, glistening with the shining muzzles of cannon. After its confluence with the Dordogne, the river expands into the Gironde, and a few hours bring us to the Great Cordouan lighthouse, built high above yellow sands at its mouth. Following the coast-line to the northward, we get a distant view of La Rochelle—a picture of quaint towers and white walls, stretching along the level shore. Soon after we enter the river Charente, and following its windings past villages and windmills, we at length arrive at Rochefort, which is, although a dull sleepy town, one of the chief naval arsenals of France. We leave Rochefort by the railway, which runs through league after league of level vineyard—through the heart of the monotonous Charente wine district—to Poitiers, a picturesque old town, which looks down on the flat country from the top of a steep hill, bristling with ruined towers and tall spires. Here, in the narrow streets, are many charming "bits" of ancient building, any one of which would well repay examination, and still more would the wonderful old church of Notre Dame, the Cathedral, the celebrated Palais de Justice, with its vast and curious fire-places, or any of the ten or twelve churches which rear themselves above the tiled roofs of this very ancient city, whose past history is of equal interest with its present quaintness.

From Poitiers, a ride of two hours by rail takes us to Tours, the peculiar tall towers at the western end of the Cathedral being visible for many miles across the dusty plain which lies around. In this beautiful sunlit town we could well afford to sit quietly down and enjoy the rich and well-varied architectural beauties which abound in nearly every street; but as yet we have barely arrived at the commencement of our actual work, and we, therefore, cannot afford to pause until passing the tall front of the Cathedral and a gloomy castle beyond. At length we find ourselves on a fine stone bridge, which spans the wide Loire.

Looking eastward, up the stream, a broad landscape of green trees and sandy vineyards lies before us bordering the river-banks. This is the district which we are about to explore, and here we are within a few miles of those great historical castles which add such an interest to this particular neighbourhood, and which form the subject of this paper: several indeed are just visible in the distance from the tops of the Cathedral towers.

But before examining any one of them in particular, it is desirable to preface the details with a few remarks on Chateaux in general.

The castles of France are a class of buildings possessing a strongly marked character of their own, distinct from anything in architectural art to be found elsewhere.

During the earlier middle ages, castles throughout Europe had general points of resemblance, both as to arrangement and appearance; but later, the feudalism of various countries gradually developed a style peculiar to each. In England, no very great progress in style was ever made beyond that of the massive square or round towers, with narrow loopholes and embattled parapets, such as were to be seen at Caerphilly or Chepstow, for at a comparatively early stage of our history the feudal castle had come to be represented by the fortified country-house and the moated grange. But in France, one of the great principles of Feudalism, a hard and fast distinction between the upper and lower classes, remained in force much longer, and thus when the barons and merchants of England were building Gothic manor-houses and Tudor mansions, the kings and seigneurs of France were rearing on the slopes of the Loire valley and elsewhere those great fortress-palaces which, with her unequalled cathedrals, remain to show what must have been the splendour and power of France in Mediæval times.

A castle, whether rising from the border of a Scotch lake, crowning some steep hill above an English river or Welsh valley, or perched on a crag overhanging the Rhine, generally suggests the idea of a picturesque mass of crumbling walls, half-hidden by foliage, where gatehouse and keep have lain for generations, roofless, and open to winter frost and summer sun. This aspect of decay in that which was once so formidable, possesses a certain interest and beauty; but the picturesqueness of the French chateaux is of quite a different order, for in spite of time, and the storms of battle and revolution which have swept against them, they are, as a rule, still in good repair, and often inhabited. The original casements still swing in the mullioned windows, the sculpture of four hundred years ago decorates the great stone towers, and these retain their conical roofs and bristling iron finials.

The conical-roofed towers, usually circular, are one of the striking peculiarities of the French castles. Generally, they are great structures built up from the ground, as at Chaumont and Chambord; in other and later examples, as at Chenonceaux and Azay-le-Rideau, they are corbelled forward from the angle of the building, or from the face of the wall. This corbelling is usually managed with very great taste as to design, and the corbel is in itself a leading feature of the style, whether used for aiding defensive purposes, or merely as an ornament.

Good specimens of it are seen at Chaumont, Azay-le-Rideau, and Pierrefonds, where galleries which encircle the tops of the great towers are built forward on corbels. Use is also made of this feature in the entrance to Chenonceaux, where a pair of corbels form a rich balcony above the doorway. They are chiefly used, however, at the tops of the towers, and are enriched, or simple and massive, according to the age in which they were designed. A good example of this tower corbelling is to be seen in England, and the idea of it was perhaps suggested by the French chateaux. I refer to the new angle tower of Cardiff Castle. But the best example extant is to be seen at the Chateau of Pierrefonds,[*] near Paris. This magnificent building was purchased by the First Napoleon for £108, and £200,000 have since been expended on its restoration.

Amboise is the first chateau we visit after leaving Tours; it is about fifteen miles by rail from that city, and it stands on a rock high above the Loire. From the level of the valley, two great towers, each nearly 50ft. in diameter, are carried up to the level of the rocky platform on which the chateau is built. They contain passages, which ascend in cork-screw fashion, the slope of which is so gradual, and the width so great, that horses and carriages can be driven up them to the summit of the rock. These great staircases without stairs (for such in effect they really are) are elaborately vaulted in stone, with bits of rich carving peeping out beneath corbels, and at the intersections of vaulting ribs. The spot now occupied by the castle was once an encampment of Julius Cæsar, and some caverns still seen in the sandy rock are said to have been used as granaries by his soldiers.

Much of the older part of the Chateau has disappeared, but enough remains to make this one of the most remarkable spots in the whole of France.

The tower parapets overhang a precipice; and from these parapets a magnificent view can be had both up and down the river, the great breadth of which is broken here and there by long, wooded islands—quite a usual feature in the French rivers. Straight underneath lie the streets and house-roofs of the quaint old town, which seem to be peacefully dozing in the sunshine. How unlike to that day when those very streets streamed with blood, and when the water of the Loire itself is said to have turned red! This was in 1560, at the time of the religious wars of France, which were ushered in by the following incident at this place:—A Huguenot plot to rescue from the charge of the Duc de Guise the young King Francis II. was betrayed, and 1,200 of the conspirators were taken into the streets below the Castle walls and beheaded. This slaughter was witnessed from a balcony in front of the Castle by Catherine de Medicis, her three sons, afterwards kings of France, and Mary Queen of Scots, who were dressed in court costume. Space will not allow me to do more than allude to the little chapel—a perfect gem of Late Gothic architecture—which is built on the summit of a great masonry buttress, springing from the valley below the Castle.

A pleasant drive of a dozen miles through the forest of Amboise, and up the valley of the Cher, brings us to Chenonceaux—a veritable chateau, complete, and all erected at about the same period.

Perhaps, considered as a building, this is the most picturesque of all, for the whole castle, or rather mansion, is built on a bridge, partly the foundation of an old mill, which stretches across the Cher. Corbelled turrets and balconies, elaborate dormers, "chisel-backed" roofs, and gorgeous iron finials are seen here in native perfection. Strange to say, the Revolution, which elsewhere wrought such a work of ruin and plunder, spared this beautiful old house and its contents; a circumstance which is said to be due to the good feeling held by the people towards the lady occupying it at the time. The interior has accordingly been preserved almost without alteration, and the old rooms are still decorated with their quaintly-carved furniture, stained glass, rich tapestries, old china, enamels, paintings, &c., even to the original books on the shelves of the library. There are many interesting associations connected with Chenonceaux: that great art-lover Francis I., the founder of the Louvre, lived here, and the mirror of Mary Queen of Scots, who came here as a bride, is still shown. The house was given by Henri II., of France, to Diana of Poitiers as a residence, but on his death it was seized by his wife, Catherine de Medicis, whose bedroom, with its old furniture, remains nearly untouched. To Madame Dupin, who possessed it during the Revolution, Rousseau, Voltaire, and others, the most eminent literary men of France during last century, were constant visitors; and at Chenonceaux many a French play and poem is said to have had its origin.

Chaumont is the next point of interest after leaving Amboise. The favourite position—that of a high cliff above the river—has again been chosen for the Chateau. Miles of green river-bank and sandy river-bed can be seen from the woods around the castle, for the Loire, though one of the broad rivers of Europe, often in summer has not so much water as can generally be seen in our river Taff. But the reverse of this is the case in winter, when, in spite of high *levees* or dykes forming artificial banks along the river-sides for some hundreds of miles, the river sometimes lays the whole surrounding country under water. About forty years ago, a whole fleet of boats was sent from Paris with provisions to succour the people of this district who had been rendered houseless by the floods.

The Chateau of Chaumont is entered by a drawbridge flanked by two of the typical round towers, the Mediæval machinery of portcullis and drawbridge being still in use.

The furniture and old tapestry, a large amount of fine old pottery, and cut glass, with ancient domestic ornaments, are preserved in the towers, and the scarlet hat of Cardinal George d'Amboise, born at this place and minister of France under Louis XII., is still hung in the chapel.

It was for this gloomy castle that Catherine de Medicis compelled Diana of Poitiers to exchange her pretty Chateau of Chenonceaux on the death of Henri II.

The eastern end of the chapel is decorated with some ancient Mediæval paintings on panel, which are especially interesting both from their worth as specimens of ancient art, and from their historical value.

On a hot summer's day no more desirable a retreat could be found than the courtyard of the castle. In front stretches the broad sunlit landscape of winding river and distant vineyards, and on all other sides lies the cool shadow of the arcade, and of the great building which towers above it.

Perhaps the most celebrated of the Chateux is that of Blois,[*] which we visit after leaving Chaumont. Some of the early architecture of France, as well as some of the latest, with specimens of the work of all intervening periods, make up this great pile of buildings. The main front is chiefly of red brick, and is one of the earliest examples extant of a Gothic design erected with that material. Much of the work in this front is elaborately gilded and decorated, especially around an equestrian statue of the young Louis XII., in whose reign this wing was built, which stands in a rich arch above the entrance. The suites of rooms are gorgeously decorated, particularly the chimney-pieces, the whole of the castle having been carefully restored within the last twelve years, strictly in accordance, as far as it can be, with ancient precedent. In the upper part of the entrance front is a most interesting Museum, chiefly of Works of Art, and a good gallery of paintings. The various wings inclose a great courtyard, and, on entering this, the attention is at once riveted by the excessive richness of a vast pile which rises on the right; this is the Francis I. building, the most gorgeous specimen of Early Renaissance architecture in France; indeed, it is not surpassed by anything of its kind in Europe. From the front of it projects the celebrated staircase, open to the air, and covered both on the exterior and interior with sculpture, so delicate as to resemble fine ivory carving. A corresponding richness of decoration extends to the interior of these rooms also, the original patterns of stamped leather, and of the carved dados, being reproduced on the walls.

Splendid as these apartments are, a feeling of gloom seems to pervade them, perhaps on account of the dreadful deeds which darken the history of this great building, and of which constant reminders are everywhere seen. By a plot of Catherine de Medicis, the Duc de Guise and his brother, Cardinal de Lorraine, were enticed from Paris to take part in a conference here. Soon after their arrival, the Duke, being sent for by the King, passed through a doorway, still shown to the visitor, behind which were concealed more than forty of the King's gentlemen-in-waiting; each of these assassins delivered his blow, and their victim fell, pierced with as many daggers. Prayers were at the moment being offered up for the success of this plot, in the chapel close at hand. The Cardinal was murdered the next day in a vault under another part of the Castle. The outer side of this wing overhangs a precipice, and much of this front is also painted and gilded. In one of the upper rooms Queen Marie de Medicis was imprisoned by her son, Louis XIII.; she contrived to escape, letting herself down by a rope from one of the windows. The upper end of the courtyard was erected by Gaston, Duc d'Orleans, from designs by Mansard; it is quite out of harmony with the other parts of the Chateau. The left side of the quadrangle is formed by the chapel; beyond rises an old tower, in the upper part of which was the observatory of Catherine de Medicis, where she spent much of her time plotting and scheming, and consulting the stars with the astrologer. She died a raving lunatic at Blois, a few days after the execution of those plots previously referred to, of which she was the instigator.

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[*] A sketch in the courtyard of Pierrefonds, as restored by the late M. Viollet-le-Duc, was reproduced from that architect's drawing in the BUILDING NEWS, Dec. 19, 1879.

[*] For illustrations see the BUILDING NEWS for June 25 (two double-page elevations), and Dec. 3, 1875. The chateaux at Carcassonne, Chenonceaux, and Aldes were given, together with the chimney-piece at Blois, in our reproduction of Mr. Ernest George's "Sketches on the Loire," Dec. 25, 1874.

The city of Blois surrounds the Chateau, sloping down a steep ridge to the river-bank.

It contains an interesting Cathedral, a large number of churches, and many fine old houses. But any particular description of these—of the old City of Orleans, or of the noble Cathedral of Chartres, both of which lie in our route for Paris—is not within the limits of our subject, and, as the aforesaid route, after leaving Blois, takes us into a fresh district, we have there seen the last of the Chateaux of the Loire.

AN EXPERIMENT IN ACOUSTICS.

LAST Saturday afternoon an interesting acoustical experiment took place in the premises of Mr. A. C. Engert, of the City-road, the object of which was to show how sound may be propagated and improved by the use of steel plates and wires. Last week we gave a *résumé* of Mr. Engert's plan, and we are now enabled to speak with more confidence of the method adopted, believing that the principle is capable of being developed and applied to the improvement of sound in buildings not properly planned for that purpose. With all our practical science and architectural progress, it seems almost impossible for our best architects to design a hall or a concert-room that is fairly perfect as regards sound; even those who have set themselves to solve the problem, unhampered by other necessities, have failed in the attempt, as that great failure, in so many respects, the Albert Hall itself, affords a proof. The old adage is exemplified in this as in many other matters, that an ounce of fact is worth a ton of theory. Mr. Engert has been a student of the subject for forty years, and he seems to have tested every step by experiment. Those who visited the late Building Exhibition at the Agricultural Hall at Islington may remember the stall which this gentleman had fitted up, in which was placed a piano, having several steel plates hung behind it for the purpose of showing how the notes of the instrument were increased in volume and richness. Many who had the curiosity to enter the stall expressed some doubt about the matter, till it was clearly proved to them that the plates did really magnify the sound, and that the instrument played without their assistance was wanting in tone and richness. But this experiment was hardly practical in its results. People did not care to order a lot of rough steel-plates straight off, to hang behind their costly drawing-room pianoforte. Since then, Mr. Engert has been busily engaged perfecting his theory, and he now has introduced an improvement in the shape of steel wires, which are less unsightly, and can be applied to rooms of all shapes. By the use of the plates or wires, artificial resonance is obtained, and further every sound becomes fuller and richer; the speaker finds he can use less voice to produce the same effect, and his efforts to make himself heard, being reduced, are rendered less harsh.

Now, architects usually endeavour to obtain this desirable result in a concert or lecture-hall by using linings of wood, sounding-boards, and reflectors; and pine wood is known to be a valuable material for this purpose, as sound travels in it four times quicker than in air; but unfortunately a well-filled public room neutralises the effect, for every individual becomes a damper, and deadens the sound. There are also, the disturbing elements of architectural effect, breaks, recesses, columns, timber-roofs, &c., to contend against, which cause return-waves of sound to follow one another at different intervals, according to the distance and angle of the obstruction, and thus confusion of sound is the result. By the judicious use of drapery the after-sound-waves may be prevented or deadened; for it must be remembered the secret of causing sound to be heard clearly and distinctly is to prevent the repetition of sound-waves from different distances, so that, in fact, the return-waves should reach in a due time the original sound, and combine with it and reinforce it as it were. Only by securing this simultaneous return of the sound-waves can distinctness be obtained.

Mr. Engert's first experiment last Saturday was quite conclusive as to the value of steel plates in producing resonance. In a room about 18ft. square a piano was placed, behind which were hung or fastened a number of vibrating steel plates, of gauges from 20 to 28, so placed that the sound-waves might act freely between the plates. To assist this the plates are curved a little, and they are also fastened together by spiral steel springs. At their lower end they hang quite free, so that they take up any vibration in the air produced by a note. The wave thus confined between the plates, and repelled a large number of times, creates a repetition of the sound, or a combination of these repetitions are produced, adding to the volume and richness of the original note. Proof of the value of the steel plates was afforded when a young lady (Miss Rolfe, daughter of Mr. Engert's partner.) played an air on the piano, and also when her sister accompanied her in singing. Though the instrument was rapidly played, each note was distinctly heard; the steel plates, in fact, absorb the vibrations, and respond to the same sound. The thicker plates, as may be expected, favour the higher notes, and the thinner ones the lower notes.

The second experiment was made to show the effect of steel wires in distributing the sound. Those who were present accompanied the inventor to a large factory, where eight wires were stretched longitudinally at a height of 8 or 9ft. from the floor. These were tightened to a certain tension by screws at one end, and fixed to hooks at the other end; across the wires were others, connected by spiral springs, while vertical wires fixed to the floor, were passed through a space left open by the removal of one of the floor boards. These wires were behind the pianoforte, which stood near one end of the room of rectangular shape. After the audience had been distributed in different parts of the room, Mr. Engert made a few remarks, which were distinctly audible to every one. He next showed the effect of his speaking when his listeners were in an adjoining part of the factory without wires, and afterwards the experiment was repeated, the visitors going upon the floor above, where four wires were longitudinally fixed in connection with the upright ones, which we have before described. The speaker remained below, and his remarks were distinctly heard above when the listeners stood between and below the wires, but at other parts of the loft he was inaudible. It may be explained thus: the wires absorb the vibrations of the voice, and convey it from one to another, by which means every word is distributed over the room with clearness. No after-sound was audible, as the waves are broken by the wires, which take up the notes, and give them out again in every direction. The effect of the wires is to increase the speed of sound, to spread it over a larger space, and prevent the return of vibrations. For this purpose the wires must be tuned to the room, so as to enable them to take up the vibrations readily, and convey them. The inventor does not claim to magnify the sound by these means, but to convey and spread it with distinctness, and to prevent any echo or confusion that may exist in the room. The wires of different gauges, according to their length, are placed 2 or 3ft. apart, and one or more layers of them, all connected, may be fixed at certain heights, which are regulated by experiment. The lower they are, the better effect they are said to produce. In a church, a height of 15ft. may be taken. The experiments were enlivened by some music and songs, every note of which was rendered distinct by the arrangement, so that one could enjoy music in any part of a large room, no matter at what distance from the instrument. It must be remarked that Mr. Engert's system is not the plan that has so often been advocated in our paper to prevent echo, which consists in fixing wires across the building. If the system cannot be regarded as original, the inventor deserves credit for being the first to apply wires for the distribution of sound in a building.

There are certain physical laws which Mr. Engert has taken into account in the improvements he has introduced, the most important of them being that law by which a string, when at rest, absorbs the particular undulation or musical note which it gives out when struck. It is well known that when a musical note is sounded in the presence of an instrument capable of sounding the same note, this instrument takes up the note and gives it out of its own accord. A piano or harp rings to the sound of another instrument which is touched, and in a like manner the strings or wires in Mr. Engert's apparatus absorb the vibrations of sound of the speaker or singer, and carry them off, preventing their return. The wires are tuned to the room, and their vibrations break the sound-waves, and destroy the surplus ones which so frequently create echo or confusion of sound. We may thus regard Mr. Engert's plan as the means of distributing the sound-waves more evenly, and preventing the after-sound, which is so destructive to voice and music in many of our public rooms. In air sound travels 1,100ft. in a second, but in steel the speed is increased more than tenfold. One advantage of the system is its simplicity and readiness of application. It is not cumbersome, or unsightly; it need not interfere with the architectural arrangements, no artificial ceiling or resonant walls are required. Buildings of semicircular shape and without the obstructions of columns and arches are rare; but the wires can be introduced in any room, indeed, the value of the method is the readiness with which it can be applied to buildings of imperfect construction. We understand that the cost would be trifling. An ordinary church would probably require the expenditure of from £50 to £100, to fit it up with wires. Mr. Engert's experiments were necessarily rather incomplete, and we should like to see them tried in a church or lecture-hall of confessedly bad character for sound. A committee of architects of the R.I.B.A. might well undertake the task of making a few experiments—there is no lack of suitable buildings to try them in. In the mean time the attention of architects individually may be directed to what seems a very useful remedy for imperfect acoustics in buildings.

REPORT OF THE ROYAL COMMISSIONERS ON THE DRAINAGE OF DUBLIN.

WE have received a bulky blue-book, containing the report and minutes of evidence on the recent inquiry into the present system of sewerage and drainage of the city of Dublin, and how far they affect the sanitary condition of the city and the river Liffey. Mr. Robert Rawlinson and Dr. Francis Xavier MacCabe were appointed Commissioners, and their report and recommendations are suggestive. The report, which occupies several pages, is divided into four parts, and deals separately with the present system of drainage, and the condition of the river Liffey. Personal inspections were made of the river and the city generally, and it was soon found that the system of sewerage was not wholly answerable for the high rate of mortality which had prevailed; but that it was to be traced to other causes, and chiefly the tenement houses of Dublin. The medical evidence is very strong upon this fact, and seems to point to them as the prime source of the excessively high death-rate. They are badly classified and registered, dilapidated, dirty, overcrowded, and ill-ventilated, according to the statements made, and the report plainly says that, until the condition of these houses shall have been improved, the general health of the city will continue to suffer. That portion of the report which describes the city and river is full and particular. The river Liffey, which flows from west to east, intersects the city about equally;

within the city boundary the river is a tidal stream, embanked by quays, faced with granite, and presenting along both sides the sewer outlets, through which the sewage of Dublin empties itself into the river. At high water, these outlets are covered; at low water they are exposed with a large proportion of the bed of the river. The geology and meteorology of the city are next described, from which we learn the island has a wet climate; in the south and west it is warm and moist, though Dublin itself, being on the east side, has a lower rainfall and a drier climate. The Commissioners say, however, there are no elements in the site to make the climate necessarily unwholesome, and that by efficient sanitary works, Dublin may be made as fresh, sweet, and wholesome in its surface and atmosphere as any city in Europe. Speaking of the sewerage and drainage, the Commissioners endorse the remark of the city engineer in a recent report, to the effect that it is a mistake to charge the exceptionally high death-rate on defects in the main sewering. In short, from our perusal of the report, it is clear that the opinion of the city engineer has been borne out—namely, that it is to defective house-drainage, to the miserable state of repair in which the tenement houses are kept, and to poverty arising from drink, that the high death-rate in Dublin is to be attributed. But while the report speaks creditably of the improvements carried out in the old sewers, it observes that the main sewers of Dublin cannot be accepted as perfect, such as would be new designed and carried out without reference to old and badly-constructed drains. They harbour and retain the gases generated in the lower levels, and convey them to the higher parts, rendering the suburbs unhealthy. The house-drainage also, from the evidence given, is very defective; the drains appear generally to be constructed of rubble wall channels, resting on the soil beneath the basement, and liable to leakage, which saturates the subsoil, and they were originally intended to carry off the waste water only. With improved water supply, the drainage of subsoil-water by means of wells and pumps has ceased, and the result has been a rise in the subsoil water, and a baneful effect upon general health. Attention is directed also to the want of break at the point of connection between the drains and the sewers. The condition of the river, and the former main drainage plans, are next discussed at some length. Mention is made of various schemes for abating the nuisance of pollution by the use of flushing reservoirs, dams, and weirs, and Mr. Stoney's condemnation of them is fully acquiesced in. The report then enters into a particular description of the five plans brought before the Commissioners, namely:—Plan No. 1, by Mr. Parke Neville, C.E., city engineer; plan No. 2, by Mr. R. Hassard, C.E., and Mr. A. Tyrrell, C.E.; plan No. 3, by Mr. Andrew Palles, C.E., and Jas. Price, C.E.; plan No. 4, by Mr. J. Doherty, C.E.; and plan No. 5, by Mr. J. O. Moynan, C.E. These plans are all given in the appendix, and show generally high and low-level intercepting sewers. We shall content ourselves with giving the general conclusions of the commission with respect to these plans. They consider plan No. 1, by the city engineer, best fulfils the requirements of city, river, port, and harbour purification; it provides for the interception of the sewage from the entire areas north and south, and also for the purification of the port and harbour by low-level and high-level intercepting sewers, and the discharge of the dry weather and ordinary sewage by one main outlet sewer, continued along and beyond the North Bull wall into deep water at low tides, where the tidal flow is seawards. They further say:—

"Plan No. 1 has been prepared by the city engineer, who is most intimately acquainted with the city, with its sewers, with its drains, and with its water supply. He has also previously prepared main-drainage plans, has worked out all the details of the local drainage areas and rain-fall; is conversant with the state, character, and action of the existing main sewers; both during dry-weather periods, and when in a state of flood, and by having had charge of the main sewers and streets for many years, he has a full knowledge of the subsoil of the city which will have to be opened out and worked in for the construction of the main intercepting sewers; and he has also studied the tidal flow, in and out, of the harbour and river, for a number of years, as indicated by elaborate float experiments. In the Main Drainage Scheme of 1871 the sewers were designed to have capacity for the reception and removal of 7,500 cubic feet of sewage per minute. Subsequently Rathmines and Pembroke have been separated, the sewage from these townships being provided for separately. We have learned that the dry-weather flow from the sewers of Dublin, when completed, may amount to 2,000 cubic feet per minute, and we have arranged with the city engineer to provide for a maximum of 5,000 cubic feet per minute in the intercepting mains, and for 3,500 cubic feet in the outlets. The estimates have been carefully revised, and have been reduced from £350,000, the amount stated by the city engineer in his evidence, to £252,208 15s. 1d., and with land engines and pumps and other contingencies to the sum of £294,170 15s., or say £300,000, and we see no reason to doubt but that the proposed works may be executed for the sum named." They further recommend:—2. That the sewerage of the city be completed as soon as practicable, so that every street within the municipal area may be provided with a sufficient main sewer. 3. That the whole of the sewers be provided with proper ventilators, side entrances, manholes, and flushing arrangements, not fewer than twenty separate ventilators being provided for, on each mile of sewer. 4. That the entire scavenging of Dublin, both public and domestic, be undertaken, and carried out by the Corporation.

Mr. Hassard's plan, No. 2, is also spoken of highly; the scheme is pronounced original and bold in conception, but the commission think the suggested line of outlet sewer eight miles in length, and by a tunnel through the Hill of Howth, unnecessary to the purification of the river, port, and harbour. Plans 3, 4, and 5 do not provide for carrying the sewage beyond the harbour, and accordingly they are considered imperfect, as they would not purify the port and harbour. The report, however, speaks in high terms of the engineering ability displayed in them. The commissioners also report that the entire system of sewers and drains should be ventilated, and have additional side-entrances, manholes, gullies, and flushing arrangements; that it is desirable to extend the Artisans' and Labourers' Dwellings Act; that the courts and yards of tenement houses require paving; that better scavenging should be provided, and the roads improved. These are, in brief, the recommendations of the report. The largest part of the volume is taken up with the minutes of evidence, which comprise 14 days' work, and will be found of interest and value, while the statistical information in the appendix adds to the completeness of this official return.

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SURREY ARCHÆOLOGICAL SOCIETY.

THE annual meeting of this Society was held at Farnham, on Friday week. The proceedings commenced at the parish-church, where a paper was read by Mr. Ralph Nevill, F.S.A., F.R.I.B.A., who mentioned that the church was restored in 1858 by Mr. B. Ferrey. The archdeanery of Surrey, to which this church was attached, was created in 1120, and it was from this period that the columns and capitals of the chancel—the oldest existing portion of the fabric—dated; the capitals of the new large columns were a copy of the older work, but, as would be seen, a very inferior copy; the lines of shadow in the old work were more in number, and much more delicate. Archdeacon Inge, who flourished about 1335, left 300 marks for completing the chancel which he had begun to rebuild, but had left unfinished. In 1363 his successor, John de Edynton, was summoned before the bishop, William of Wykeham, on the charge of embezzling the materials collected together by the archdeacon, and again, in 1369, for neglecting to proceed with the repairs. It was not till 1369 that William of Wykeham issued a commission to an Irish bishop to consecrate the chancel of the parish-church of Farnham, a high altar lately built there, and any other altars that might require consecration. He believed the greater part of the work in nave and chancel might be ascribed to 1350 to 1399. The transept entrances were widened by Mr. Ferrey during his restoration, and the present excellent battlements to the central tower dated from the same period; the turrets to this tower were octagonal, and not hexagonal, as described in all the county histories. There were a number of monuments, tablets, and brasses, which it was interesting to find had not suffered at the hands of architect, clergy, or churchwardens. The members then proceeded by carriages past the residence of the Sir William Temple eulogised by Macaulay, where Swift wrote many of his works, and by the unhappy Stella's cottage to Waverley Abbey on the banks of the Wey, where a paper on the history of the Abbey, written by Mr. F. J. Baijent, was read. The history of this Cistercian institution was traced from its foundation in 1123 to its suppression in 1536, and gradual change of hands the property has suffered to the present time. Only a few traces remain of the Abbey church, which was built 1203-78. A return was then made to Farnham Castle, where the members were received by the Bishop of Winchester. A paper on the history of the Castle was read by the Hon. W. St. John Brodrick, M.P. Founded by Henry of Blois, brother to Stephen, a site which already, for three centuries, had belonged to the Bishops of Winchester, it was rebuilt in its present form as a castellated residence for the bishops during the reign of Henry III. In a remonstrance to Queen Elizabeth, in 1595, by the then Bishop, it was stated that his net revenue scarcely exceeded £500 annually, and that the castle was in so ruinous a condition that it would need at least double that sum for repair. For a short time, at the close of the 16th century, the see was left vacant, and Farnham fell in a very ruinous condition. During the Civil wars the castle was occupied in succession by the Royalists and Parliamentarians, and after the battle of Alton 808 prisoners were lodged in the church and castle at Farnham. At the Restoration the castle, which had been put to sale, was restored to the bishopric, and in 1684 the ruins were converted into the present habitable mansion by Bishop Morley, at a cost of £10,000. Further improvements were made in the castle and grounds adjoining by Bishop Brownlow North, at the beginning of the present century, and also by the present bishop. The members then inspected the castle, under the guidance of Mr. J. Henry Christian, who described its architectural features. The servants' hall, used for domestic purposes since the reign of Edward III., was first seen, Mr. Christian explaining his grounds for believing it to be the chapel of Henry de Blois' castle, and the oldest portion of the building extant. The traces of Bishop Morley's work in the exterior of the dining-hall having been examined, the members mounted to the keep, the summit of which is laid out as kitchen and flower garden, and the visit closed with a walk in the private grounds and park, the members dining together at an hotel in the evening.

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IMPROVEMENTS IN BELFAST.

LAST year no less than 1,324 new buildings were added to the town of Belfast. At the junction of Talbot-street and Robert-street, where less than twelve months ago stood a number of dirty hovels, tenanted by habitual thieves and prostitutes, now rises a substantial building four stories high. Built of red brick, it may be plain, but 50ft. high, and with a frontage to Robert-street of 76ft. and to Talbot-street of 60ft., it is at least commodious. The building, which is intended for a bonded store, is being erected by Messrs. M'Laughlin and Harvey, for Messrs. Young, King, and Co., of Calender-street, from the design of Mr. W. H. Lynn, architect. It is supported on piles and heavy metal columns. Commenced in March last, the work has been pushed on rapidly, and it is now almost completed. On the site of the old Belfast Academy buildings, Messrs. John Hogg and Co., flax merchants, have had commodious stores erected, three stories high, built of red brick, and somewhat ornamentally designed. The structure is a most extensive one, and, in addition to the necessary space for storage purposes, contains spacious and well-lighted offices. Part of it has been already completed, and has been in the occupation of the firm for some months, but an extensive addition is now being made to it. The entire building will have a frontage to Academy-street of about 220ft., and will extend back towards York-street for a distance of 157ft. The work is being carried out by Messrs. Dixon, Clifton-street. Opposite to Messrs. Hogg's new warehouse is the entrance to St. Anne's Church Schools, and here, extensive alterations are in contemplation, it being intended, amongst other improvements, to rebuild the schools. But the most important alterations in this district, from the number of streets and habitations affected, are those which are now in progress in the area between Green-street and Great Patrick-street. Between these thoroughfares runs Lynas-lane, and parallel to it William's-lane two collections of pestilent dens, the haunts of the very worst characters to be found in the locality. Within the last fortnight several rows of these dens have been demolished, and a large space cleared out for building purposes. On this vacant ground a substantial store is about to be erected for Mr. Edgar, seed-merchant, of Edinburgh. The plans for the structure have been prepared by Mr. Robert Watt, architect, and the work of erection will shortly be commenced. As arranged by the Town Council, William's-lane is to be entirely closed up, and a space equal to its width added to the breadth of Lynas-lane, making the latter thoroughfare 20ft. wide, instead of as now only 11ft. This will be the first step towards the formation of a commodious thoroughfare between Great Patrick-street and Green-street, to take the place of the narrow and dirty lanes hitherto existing. The width of Green-street is also to be increased to 30ft. Towards Lynas-lane the new building will have a frontage of 124ft. It will extend along Green-street a distance of 84ft.

ROOF COVERINGS.

THE weights of roof coverings vary considerably, and we give the following table, which will be found of service by those who wish to calculate the loads on roofs. The weights are given in pounds per square foot:—

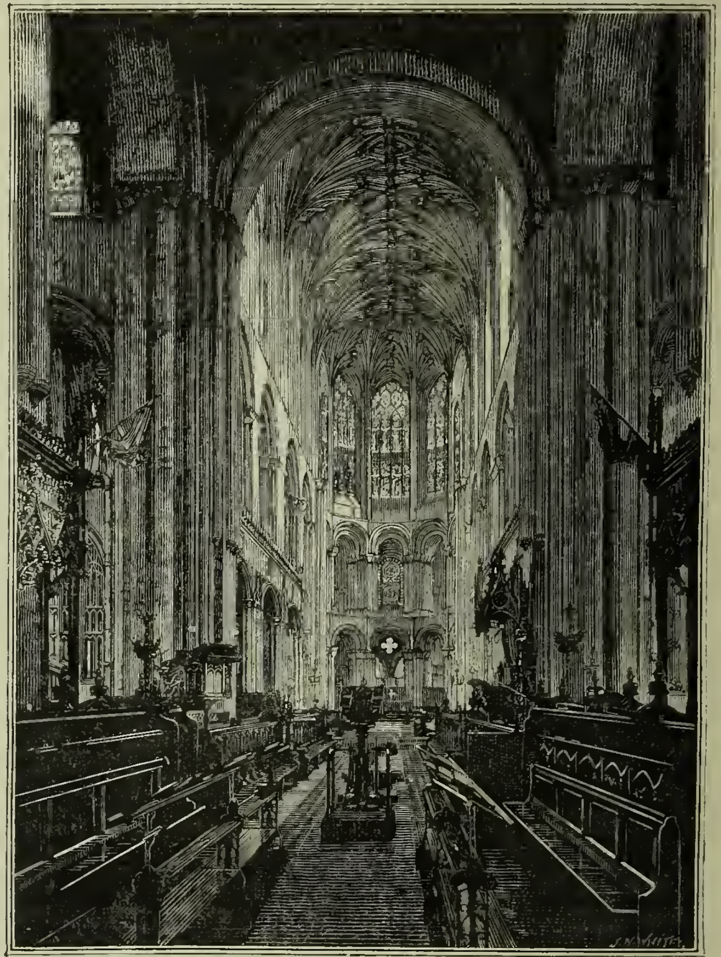
Slates	5 to 11
Tiles	7 to 20
Pantiles	10
Boarding ¾in thick	2½
Sheet iron (16 w.g.) and laths	5
Corrugated iron and laths	5·5
Sheet lead	7
Sheet zinc	1·25 to 1·63

Another table gives for slates of all sizes 3in. lap, except rags or Queens, a weight of 8lb. per foot. In calculating the weight of common rafters and purlins of timber an average of 7lb. is put down, though the exact weight will depend largely on the space and the distance apart of the principals: the farther they are from one another the greater will be the scantlings of the timbers, and the more the weight. In iron roofs, a common truss of 50ft. span will weigh about 3 to 5lb. per square foot of area, though many of our large railway-station roofs constructed on the bowstring or arched principle, weigh from 10 to 24lb.

THE ARCHITECTURAL ASSOCIATION IN EAST ANGLIA.

THE ancient city of Norwich has been selected as the centre for the eleventh annual excursion of the Architectural Association, an outing which will occupy those assisting in it the whole of next week. Although Norwich itself is an exception, being blessed with the busy manufactories, the enterprising commerce, the extending suburbs, the acrimonious politics, the sewerage difficulties, and the heavy municipal indebtedness, which denote a progressing borough, the district to be visited is, speaking generally, a declining one, with a slowly-diminishing population. In the Middle Ages, East Anglia was the seat of the woollen manufacture; its shallow ports afforded sufficient draught for the vessels of the period, and a prosperous trade with the Continent was carried on, much benefit being gained from the arts and industries introduced by the Flemish colonists. But with the substitution of coal for wood as fuel, and the increasing use of iron, the tide of life and business steadily ebbed from the Eastern Coast of England, and now the district is purely agricultural. To those members of the Association who share with Mr. Sedding an enthusiasm for the harmonious proportions, the multifold divisions, the flat surfaces, and elaborate prearranged ornamentation of the Perpendicular period, the neighbourhood to be visited will be one of unusual interest, the large and numerous churches, and the halls and timbered dwellings being chiefly of the time when the trade of Norfolk was at its zenith. These churches are more noticeable for good proportions than for purity of design and delicacy in execution; but the flint and panel flushwork, and the treatment of oak in the open roofs, and occasionally in bench ends and parcloses, has considerable merit. Reminiscences of an intercourse with Flanders are apparent in the Flamboyant tracery and dexterous use of brickwork. But it must not be supposed that the 14th, 15th, and early part of the 16th centuries are solely represented in the buildings of Norfolk. True, Early English is exceptionally rare, and the earlier phases of the Decorated style are not common; but there are rich stores of the Latest Norman work, massive in character, elaborate in ornament, and the Jacobean houses and pre-Neogothic restorations to churches, as, for example, the Renaissance turrets at the east end of St. Peter Mancroft, Norwich, and the bastard Classic alterations of mouldings in the church, ought not to be overlooked.

The interesting features to be found in Norwich itself will doubtless amply justify its selection as the head-quarters for this year's excursion; its cathedral, abounding in work of the Late Norman and Perpendicular periods, and the fragments of the great Benedictine establishment which once adjoined that minster on the south; the churches, profusely sprinkled over its labyrinthine, pebble-pitched narrow streets; the triad of imposing gateways into the cathedral close; the flint and rubble faced remains of bastions and walls environing the Mediæval core of the city; the little-known but interesting fragments of Mediæval domestic work near King and Ber-streets; the fine Benedictine nave of St. Andrew's monastery, now used as a civic hall; and the quaint Guildhall, will afford a superabundance of materials for study and sketching. But, in addition to the city itself, a wide district situate chiefly to the north and west of Norwich is to be examined during the coming week.



INTERIOR OF NORWICH CATHEDRAL.

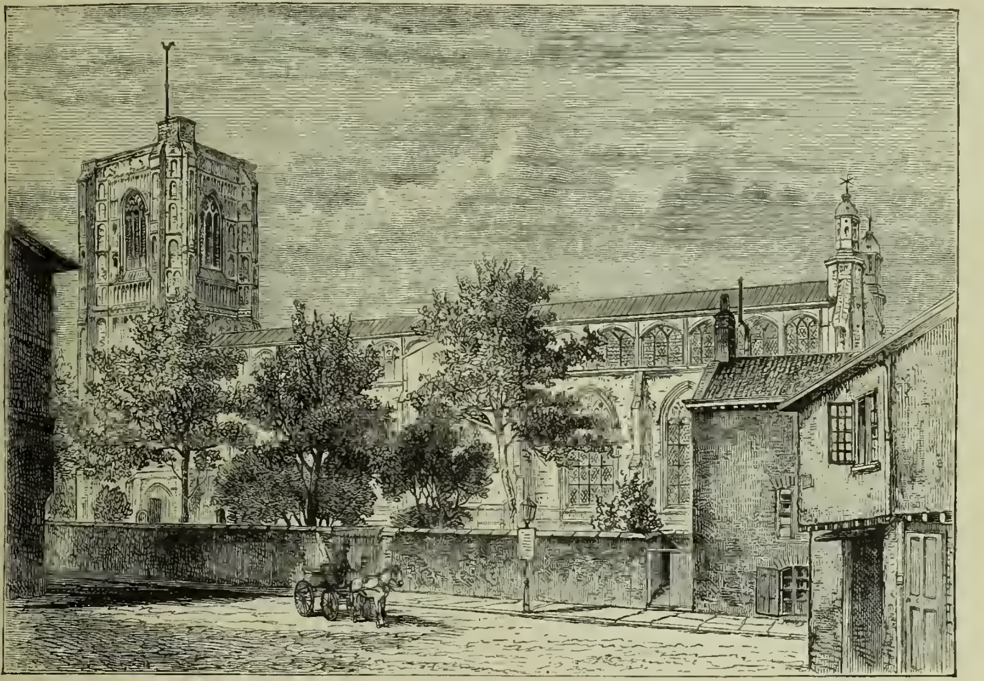
The programme now before us provides for a busy six days' work; so full is it that it would be impossible to carry out the plan in its entirety were not every item of arrival, stay, and departure precisely timed beforehand, even to the hour of breakfast at the *rendezvous*—the Norfolk Hotel, in St. Giles's-street—and the prearrangement reflects much credit on Mr. C. R. Pink, the hon. secretary. Mr. James Fowler, of Louth, will, as on former occasions, generally conduct the party, except on Thursday, when Mr. F. C. Penrose has undertaken the duty of guide.

Glancing down the circular, we notice that Monday next, the opening day, is to be devoted to the cathedral, where the surveyor to the fabric, Mr. J. H. Brown, will act as *cicerone*, meeting the members opposite the west front, which has just been rebuilt under his supervision, acting in conjunction with Mr. James Fergusson. In the afternoon three large and Late churches, situate close to each other, will be seen—St. Peter Mancroft, described by Mr. Street (who is now engaged in its restoration) as "a noble example of a Mediæval parochial church"; St. Stephen's, also in the Market-place, and of a Late and more debased character than the former, containing some dated glass of several periods in the east window; and St. Giles', where the well-proportioned flint-work tower and the groined south porch are the most interesting features. This church was extensively restored by Mr. R. M. Phipson, of Norwich, a few years ago, and most of the churches to be visited have been under the same architect's hands.

On Tuesday the members will proceed by the newly-opened railway to the little market town of Aylsham, where the large church, a Decorated structure, partially rebuilt in the Perpendicular style, will repay an hour's examination. Then carriages will be taken to the fine Perpendicular churches of Cawston and Sall, both remarkable for their open roofs, still retaining traces of colour, and for the peculiar galleries across the west tower arches. The chief incident of the day will probably be the visit to Blicking Hall, one of the finest and best-preserved Renaissance manor-houses in England; it has a picturesque quadrangular front, set in a formal terraced garden; a grand double staircase, rich in Jacobean carving, and a spacious library, containing stores of choice books and MSS. tapestry, relics of the Boleyns, and having an elaborate plastered ceiling. The little church adjoining, which has been almost rebuilt, has a few good brasses, and an elaborate monument, with effigy in alabaster, to tho late Marquis of Lothian.

North Walsham, where the Perpendicular church has a ruined tower, remains of a rood-screen, and monuments to the Paston family, will be visited by rail on Wednesday, and from thence a carriage excursion is projected to Trunch Church, whose remarkable wooden font-cover has been rendered familiar by frequent illustrations; the chancel-screen and open roof are of rich character. Near by will be seen an earlier church, with equally good roof, at Knapton; and, after looking at Edenthorpe, they will proceed to Bronholm Priory, at Bacton, where there are some Transitional Norman and Early English features. The large Late Decorated church at Worstead, a village whose name has been commemorated in the woollen fabric once made thereat, will be the last feature of the day's sightseeing.

On Thursday, a rail journey will be broken for an hour and a half at East Dereham, interesting from its association with the closing scenes in Cowper's life; a Congregational church has in recent years, we believe, been erected on the site of the house facing the market-place, in which the gentle, melancholy poet died. The cruciform parish-church, with low central steeple, and a second and equally unassuming square tower, erected opposite to, and a few feet from, the south transept, contains Cowper's tomb, and much Early Decorated work, re-cast in the 15th century. The central tower stands to the westward of the transepts, and the question may be re-debated whether an earlier tower existed over the supporting piers that can be traced, or was the intention to crown the cross abandoned on account of some defects in foundations. At New Walsingham, the Decorated refectory, and several other fragments, chiefly Early Perpendicular in character, remain, of the famous Augustinian Priory of "Our Lady of Walsingham," now the property of the Lee-Warners; there is a fine gateway to the Priory next the main street of the townlet. The church is another of the large Perpendicular edifices, with elaborate nave roofs and sculptured fonts, which will now begin somewhat to pall on the members; and there are also extensive remains of a Franciscan convent, fragments which the author of the "Glossary" has criticised as "very late and very poor." Near by, the little 14th-century groined (? pilgrims') chapel of Houghton-le-Dale (the beautiful east window has been engraved by Mr. J. H. Parker, as an example of the Transition from the Decorated to the Perpendicular), will be visited by road; and also the Wolterton Manor-house, at East Barsham, a rich example of Tudor brickwork, now occupied as a farmhouse. It is illustrated by two views in Britton's "Antiquities," Vol. II., p. 92. The return journey will be made by rail.



THE CHURCH OF ST. PETER MANCROFT, NORWICH.

The "double church" at Wymondham, concerning which the late Rev. J. L. Petit wrote an exhaustive monograph, will be the first building visited on Friday, and will doubtless occasion some controversy as to whether the ruined Decorated church of the monastery, with charming octangular tower of diminishing stages, was ever opened out to the parochial nave, of ordinary 15th-century character, annexed on the west. The wooden pillars supporting the steep tile roof of the octagonal market-cross, and the recently-restored chapel of St. Thomas à Becket, will also be noticed. Attleborough will next be visited, and after seeing the western parts of a collegiate church, now the parish-church, the members will proceed by road to see the group of large churches at Great Ellingham, Hingham, and Deopham, the last two having conspicuously lofty towers.

The last day, Saturday, like the opening one, will be a "home" day, and on it the Perpendicular church of St. Andrew, St. Andrew's and Strangers' Halls, the latter a Jacobean merchant's house, said to have been the guest-house of the Dukes of Norfolk, and four more churches, all Perpendicular, will be inspected in turn.

The northern part of East Anglia, about to be visited by the Association, teems with associations with the historic past of England, while a ghastly ghost story is not extinct at Blickling, and legends of the pilgrims' days are still extant at Walsingham and elsewhere in the country. We have sufficiently indicated the architectural features of the district to be visited to show that the visit to Norfolk will not be the least interesting of the excursions of the Architectural Association.

The illustrations of the Cathedral and St. Peter Mancroft's Church, Norwich, are reproduced from "Our Own Country," by permission of Messrs. Cassell, Petter, and Galpin.

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BILLS OF QUANTITIES AND MEASURING BUILDERS' WORK.*

I WILL endeavour to put into shape in as practical a form as possible, and in the plainest language, my experience and views on the subject. In doing so, if I should say anything that may appear to reflect upon the character or work of any architect or surveyor, or of any class of them, I am sure you will all acquit me of the intention of saying one word in disparagement of any architect or surveyor who is worthy of the name. All fair and reasonable builders look upon architects and surveyors, as a class, as their best friends, and as those without whom tho building trade cannot prosper. It is possible some of my remarks may reach the ears of some gentlemen styling themselves "surveyors," and cause irritation to them on recognising the facts of my illustratiens. To such I will say, My only object is to do good by raising the standard of their profession and my own trade, and if their method of procedure in practising the profession of a "quantity and measuring surveyor" be conducted on scientific principles, combined with honesty of purpose, they have nothing to fear from discussion. On the contrary, to all such surveyors the building trade owes a debt of gratitude for assisting to place the trade upon a sound basis, instead of being the precarious and risky business it must of necessity be while conducted under a loose, slovenly, haphazard system of measuring by untrained men, incapable of properly performing the work assigned to them, or, as in many cases, the work they assign to themselves—that is, when architects supply quantities prepared by themselves or their clerks, unauthorised by either their client, the proprietor of the building, or the builder, who are the only parties interested in the correctness or incorrectness of the surveyor's work. At the same time, in numerous instances these gentlemen take care to insert a notice on the first page of their quantities to the effect that the builder alone must be responsible and suffer for, or, as the case may be, profit by, all errors that may have been made by the surveyor. With these general remarks I proceed to deal more directly and in detail with the subject. First.—As to "Quantities." What is the meaning of the term as applied to our trade? and—What is the use of the "Bill of Quantities"? These questions may seem to you to be unnecessary, but I believe very few of the general public, members of public boards and companies, or even the legal profession, have more than a very vague and imperfect knowledge of the subject. A "Bill of Quantities" is a detailed account of the quantity, quality, and description of every portion of the work required to be done in the execution of any building, for which the person wishing to build requires to know the cost before embarking in any engagement or contract with a builder to execute the proposed work. Without a "Bill of Quantities" it is impracticable, in the case of works of any importance, to obtain, by competition, estimates or tenders for work, and it is obvious that such competition is obtained entirely in the interests of the proprietor about to build. Second.—What is the use of the quantities? The "Bill of

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* Read, by Edward Hughes, at the half-yearly meeting of the National Association of Master Builders of Great Britain at Bristol, July 27, 1880.

Quantities" is issued as a rule by the agent of the proprietor, and is neither more nor less than a written statement, on his behalf, of the quantity and description of certain goods and labour he requires, and for which he applies to a number of tradesmen for quotations in competition. In the absence of any quantities the proprietor or his architect would, probably, invite half a dozen builders to compete for his work, which work, as an example, I will assume to be of the value of (say) £5,000. The average surveyor's fees for measuring the quantities would be $1\frac{1}{2}$ per cent., or £75, and copying fees probably £10—say, a total of £85. Assuming this to be a reasonable charge for such measuring—and I think it is if the work be properly and accurately done—then the contractor's labour involved in a competition of six builders, each taking his own quantities, would be worth £510, while each of the five unsuccessful ones would be called upon to spend, either in cash to a surveyor or in value of his own or his assistant's services, £85 in consideration of his having had one chânce out of six to obtain the contract. Practically, therefore, builders refuse to compete unless quantities are delivered to them free of expense; but when quantities are supplied to them they make no charge for time, estimating, money spent in visiting the site of the proposed work, &c., which in itself is frequently a considerable sum. The case I have just assumed for argument's sake is but an average one. In many cases the proprietor desires and obtains a much wider competition. For example: in a case I have now before me no fewer than 28 tenders were submitted, the money value of which tenders (if each builder took out his own quantities) would be about 50 per cent. of the cost of the intended work. To obviate such an outlay, without depriving the proprietor of the manifest advantages of competition, the custom has become almost universal for the proprietor, through his architect, to supply, at his own cost, to each builder invited to tender for his work a copy of the quantity of the work for which he desires to obtain competition quotations. If such quantities be prepared by a *bona fide* surveyor capable of properly describing the proprietor's requirements, as set forth on the architect's plans and specifications, the use and advantages of such a "Bill of Quantities" are of immense value to the proprietor. Third.—Who prepares the "Bill of Quantities"? Sometimes the quantities are prepared by the architect himself, or by his assistants in his name. In such cases this is done either with the sanction of his client or on his own appointment and responsibility, but the builders have no voice in such appointments. In other cases the quantities are prepared by a surveyor appointed by the architect or his client. Occasionally two surveyors are appointed—one by the architect on behalf of and in the special interest of his client, and the other by election of the majority of the builders competing. I know of only one line of argument in favour of an architect acting as his own quantity surveyor, viz., that no other person can know so well as himself what are his requirements as shown and described by his plans and specifications, nor is any other person so likely to know what changes take place requiring measurement as the work progresses. At first sight, to a novice, this argument appears plausible, and, with a first-class architect of large experience, it may be made to work tolerably well; but, on the other hand, there are numerous reasons against the plan, such as—(*a*) The architect, as a rule, looks upon himself as the servant of his client only, and in many cases he is restricted by his client to a limit in regard to the cost of the proposed buildings. This is especially the case in connection with works in which architects have themselves competed; also in cases where the architect is young in the profession and more subject to the influence that may be brought to bear upon him by his client. (*b*) An architect who occasionally takes off his own quantities cannot possess the experience or the facilities and special knowledge for such work as a surveyor who devotes his whole time to it, and who has been specially trained for the work, is able to do. (*c*) An architect in good practice has the usual daily routine of duties to attend, which will necessarily prevent him giving the sole and undivided attention which is absolutely necessary while the process of abstracting quantities is proceeding, otherwise errors of a more or less serious character are sure to occur; nor can a measurer's duty be properly delegated to assistants any more than can the heavy responsible duties of eminent physicians or lawyers be delegated to unqualified clerks. (*d*) In the event of errors being discovered in the quantities supplied by the architect himself, he is at once placed in a false position. It must be most difficult for him under such circumstances to hold the balance fairly and equitably between himself and the builder on the one hand, and between the builder and the owner on the other; no matter how honest he may be, or desirous of doing what is equitable towards the builder, he cannot, in the very nature of things, avoid being biassed in a measure against the builder in the proprietor's favour, when the opposite course would expose his own errors of quantities, and thereby prejudice his client against himself. Fourth.—As to the cost of quantities: the surveyors' charges vary from $\frac{3}{4}$ per cent. to $2\frac{1}{2}$ per cent. on the total estimated cost of the work, plus the lithographers' or printers' charges for the copies. So far as my experience goes, I have paid $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, and $2\frac{1}{2}$ per cent. These variations in the charges have not been in consequence of the work being more or less elaborate or troublesome to measure in a fair proportion to the quality or accuracy of the measuring, but apparently merely subject to the caprice of the measurer. I think it but right to say I have rarely if ever known any of the leading London quantity surveyors charge more than $1\frac{1}{2}$ per cent., while at the same time the work done by them is, as a rule, of the most perfect character. Fifth.—Who pays for the quantities? We as builders know, as a matter of course, that the proprietor about to build in all cases pays the surveyor's fees, although in most cases he does not know it—simply because those fees are made a part of the contract and paid to the builder by the proprietor on the certificate of the architect, and then paid by the builder to the surveyor, whoever he may be. Sixth.—Who should be responsible for the accuracy of the quantities? In reference to the only two parties to a contract, should it be the proprietor or the builder? I have already shown that the proprietor, either directly or indirectly, through his architect, almost invariably appoints the surveyor to supply the builder a list of the quantity of the various work he desires a quotation for in competition. When he accepts a tender he undertakes to pay the builder the stipulated price for the quantity of work mentioned in his application—neither more nor less. If, therefore, the quantity given proves to be deficient or in excess, it is obviously just and right he should pay the builder less or more according to the work actually done; otherwise, in the case of excess of work done, he obtains that excess without honestly paying for it (taking advantage of the incapability or negligence of his own appointed surveyor). If, on the contrary, there be less work done, then the builder gets paid for work he has not done. During the progress of building each party under these circumstances has a strong inducement before him to take advantage the one of the other—the builder to omit some and scamp other work; while the proprietor (or his agent) may try all he can to take advantage of clauses in his contract giving him almost absolute powers to impose work upon the builder that is not mentioned in the quantities furnished to him, and may refuse to pay for such work. I think I may venture to assert that in no other trade but that of a builder and contractor does such a state of things exist as this—that a tradesman or merchant should be called upon to supply more goods than are bargained for at a given price without extra payment. For example: if a builder asks a timber-merchant to quote a price for 20,000 cubic feet of timber for a particular job, and the offer be accepted and 21,000ft. be supplied, no builder would be knave or fool enough to expect the merchant to forego his claim for the extra 1,000ft. The same argument will apply to all materials and labour also. Again: if the Corporation of Bristol advertise for and accept a tender for (say) 200 suits of police clothing, they do not expect to get 250 suits without paying for the extra 50; nor would they pay for 200 if only 150 were delivered. I submit, then, taking all in all, it is to the best interests of all parties—proprietor, architect, and builder—that in every building contract a genuine "Bill of Quantities" should be prepared by a properly-qualified surveyor at the expense of the proprietor, and guaranteed by him. This course would inspire confidence in the minds of the builder, and induce him to enter more eagerly into competition, having no fear of his being misled by incorrect quantities, and having no necessity to contemplate risk and add any sum to cover errors. The proprietor would have the advantage of better competition, and generally would obtain better work and more fair dealing from the builder, who would have no interest in omitting or scamping his work, knowing that he would be paid for the work done and no more. The architect would avoid many unpleasant discussions and disputes during the progress of the work and after its completion. Having said thus much on the general subject, I now come to Seventh.—The mode of measuring and abstracting quantities. You all know that persons undertaking to do this work differ in a most extraordinary manner—not only as to the method of doing the work itself, but also in the way of describing it when putting it into writing to circulate amongst builders. These different methods are the cause of most of the disputes arising in respect of builders' accounts; and such a state of things is not surprising when we consider the character of persons frequently employed in the offices of many architects in the provinces, who supply their own quantities to the builders tendering for their work. The persons I allude to are often men from the ranks—joiners, bricksetters, or masons—who have in the course of their regular employment at a trade picked up a little knowledge of measuring, and eventually seek and obtain employment in an architect's office, professing to be able to measure, &c. I have in my time met with many such cases, and when tested such men have shown their ignorance and utter incapacity for such work. Unfortunately, this too often happens during the progress or at the measuring up of a completed contract, when the mischief has been done. On the other hand, we have the satisfaction occasionally to receive quantities prepared by surveyors trained from their youth to such work, to which no exception can be taken; on the contrary, the builder sees at a glance the stamp of the work and has confidence in it, feeling assured the measuring has been correctly done and unmistakably described in writing. My experience has taught me that in measuring builders' work in a proper and intelligible manner, to enable the builder to price such work it is necessary in all cases, when practicable, to dissect and divide as much as possible into separate items—work involving labour; that is, by making the first item of any particular class of work to represent as nearly as possible the simplest form of it as a basis to start from, adding item by item any increased value in labour or materials as distinct items. By this method (which is practised by the best and most experienced surveyors) the work is priced according to its merits or value. I cannot illustrate this principle better than by reminding you that this is the principle upon which a lady's dress is built and priced. The material and plain labour in the making is the first item of calculation; then follow the trimmings to any extent and cost, in some cases multiplying the value of the finished dress three or four-fold that of the foundation. So it is with every description of builders' work—from the excavations and drainage to the painting and decorations. The trimmings or extra items are attended to and properly described by the *bona-fide* surveyor, but more frequently ignored by the slovenly surveyors I have already alluded to. My paper is growing too long, and I find it difficult to convey my meaning in a more condensed form. I will, therefore, conclude with a few illustrations of defective quantities which have come under my own notice. No doubt each one of you could speak to hundreds of such cases, and I trust on some future occasion other members will follow up the subject and make good the defects you will not fail to find in what I have hastily put before you. For example: we frequently find surveyors measuring so many cube yards excavating and wheeling, omitting altogether the depth and distance to wheel, &c., &c. The same applies regarding drains. I have known ornamental brickwork described as so many yards or rods of common brickwork, "the price to include all cutting, double course of blue brick plinth, moulded string-course, ornamental projecting stock brick cornices, gauged arches," &c., &c., "as shown upon the drawings." I should like to know a builder who could properly price such work from such quantities. I met with a recent case where an architect had succeeded in obtaining by competition the commission for an important public building, with an elaborate tower as part of the structure, built with dressed stone, the work being what may be described as of a "monumental" character. The quantities gave this work as so many cube feet of stone, including all labour of every description, this phrase being on the heading and not with the quantity. The result of separate tenders for the upper part of this tower was that they varied from about £500 to £1,700. The lowest tenders were undoubtedly priced as stone and setting only, omitting all labour. I have before me quantities for a public building, for which the architect's charges are two per cent., wherein he describes so many "superficial feet of moulded both sides, swing doors, hung folding, including quarter-inch polished plate-glass upper panels, protected by six wrought-iron bars, and patent swing hinges to stand open." No size of glass, no size or quality of bars, and no size or quality of hinges mentioned. In many other items he give superficial feet of doors, including best mortice locks, and rebated and moulded frames, and neither number of doors, quantity or size of frames, or number, size, or quality of locks. You all know in a matter of locks "best" is a wide term. It means anything from 7s. 6d. to 75s. In one door he gives superficial feet of door including 4in. best butts, 5 by 4 rebated and beaded frame, two barrel bolts, strong chain, drop latch, lock (value 13s. P. C.), and approved bell-pull. Another item is—"Provide and fix cistern on strong bearers, and form trap door," without dimensions or particulars of any kind. In many items of this architect's quantities, in addition to jumbling up doors, locks, hinges, bolts, &c., by the foot, he hangs on the words—"Including painting." This is notwithstanding the fact that there is a separate bill for painting. Great numbers of items of importance are given by this architect as lineal measure with no sizes. Some items are described as "fixed," while others have added to them the words "including fixing." In the former case the builder cannot tell whether the item is to include materials or not. Another specimen is—"Superficial feet of plain one-inch boards (see plan)." The last two bracketed words convince the builder that quite the opposite of plain is meant; but he is to be paid plain price. I cannot for one moment believe that the architect who has issued these quantities has personally had any hand in them, but they are in his name, and he is to receive the fees, although they have most probably been taken by some impostor who has succeeded in obtaining a place in his office. I say such measuring is nothing less than a fraud upon the proprietor. This architect holds an important public appointment, and the work in question is public work. I have recently seen a surveyor's final measured account for a building which had been prepared in draft, then altered, checked, re-checked, and lithographed for the purposes of an arbitration by order of the High Court of Justice. On this surveyor being examined before the arbitrator, he was forced to admit scores of errors in computation—mainly errors that would disgrace a charity school-boy. In one page of his account he admitted no less than six most stupid errors, several of them consisting of the pounds and shillings being placed in the wrong columns. For instance: 8½ft. at 4d. per foot was deducted as £2 10s. 0d. instead of 2s. 10d. This architect and surveyor made such an exhibition of himself that his client called the builder (who was plaintiff) aside, "threw up the sponge," and offered to pay debt, costs, and interest. I have known in one church contract the surveyor omitting to add up an item of 10,000ft., being the left-hand figure of a five-figured item in his abstract for stone facings. He also omitted the whole of the dressed stone, sills, jambs, and arches to the inside of all doors and windows; the whole of the brick lining to the church, and the gutters and down-pipes of one side of the church; besides other items, amounting in all to the value of £3,000 to £4,000. This work was done by the builder without obtaining one shilling in payment. In another case I find a surveyor describing in a bill of quantities most elaborate carved mahogany newel posts by the lineal foot. Thus, "

feet run of eight by eight Spanish mahogany newel posts cut, turned, moulded, and carved to details to be supplied, including drops and finials where required." From this description, and by the additional precaution of an examination of the contract drawings, it is impossible for any builder to say what the real value of the work may be. It might be any sum from 10s. to 50s. per foot, according to the caprice or conscience of the architect when he subsequently designed the work in detail. The same surveyor described doors of an ordinary size, but containing about sixteen panels each, some of them with raised panels and bolection moulds, and the remainder with cusped tracery planted on the panels. These doors were described as ordinary doors, but with the words, "see drawings." On reference to the drawings they were found to be one eighth of an inch scale only, on which it was impossible to show what work the architect might contemplate, when at a subsequent period (after the contract was made), he furnished details. Such details might show work worth any sum from 2s. to 6s. or 8s. per foot, and yet be in accordance with the one-eighth of an inch scale general drawings. I have seen in another schedule for competition a number of ornamental wrought-iron grilles or panels for doors, described simply by number, "to details to be subsequently supplied." It is impossible to approach the value of such work from such description; each grille might be worth any sum from 10s. to £10. In another case, an architect who was his own surveyor, required a wrought-iron cresting on the top capping of some gates to the back-yard of a house, and described it by the running foot, without the height being mentioned or a drawing of any kind to show the character of the work. The builder priced the work at 1s. 6d. per foot, or 15s. for a 10ft. gate. After the contract was settled the architect furnished a detail that would cost 30s. per foot, or about three times the value of the gate itself. More than this: he claimed the right to order two additional gates and crestings to be supplied at the same contract prices. This architect inserted in the same schedule a large sum as "Provisions" for stained glass, grates, chimney-pieces, heating apparatus, stable-fittings, &c., all of which goods he ordered himself from his own tradesmen, altogether unconnected with the contractor in any way, and he sent each of these tradesmen certificates for their account to be paid by the contractor. This work, being in a difficult country district, the contractor in his competition tender priced the work at home prices, and added 10 per cent. at the foot of his estimate as the most convenient way to increase his prices. In the final account prepared by this architect he deducted all the provisional sums and the ten per cent. the contractor had himself added in his tender, and added the net amount of his certificates to his tradesmen, and further deducted a fee from the contractor for measuring the additions and deductions in connection with these provisions. The result of this system of dealing with the account was this:—The contractor's accepted tender provided for him being liable to a reduction of (say, for example) £500 if the proprietor provided certain goods himself. These goods were so supplied, but instead of £500 being expended the architect expended £600. He orders the builder to pay his tradesmen £600, giving him credit for that sum net in the final account, but debiting him with £550 plus measuring fees. The contractor thus had to advance the money, or, in other words, he acted as banker to the proprietor, forfeiting his own legitimate profit as contracted for, and paid the architect a fee for the privilege of having been permitted or forced to do the work for nothing. This architect did not dispute the facts as stated, and he did not attempt to explain his account, but claimed absolute authority to debit or credit any sum he chose, and that his decision was final and binding. I believe this architect charged, altogether, over 5 per cent. fees on the work done in respect of the first quantities and subsequent measuring of additions and omissions, and, as is often the case, the larger the fees the worse the work. The whole of the work so done was not worth so much as the paper on which the quantities were written, while the grossest possible ignorance of such work was exhibited. In conclusion: the question will probably be put—What remedy do you propose? This is a large and difficult question, which I will not at this time venture fully to discuss, but I will just give one or two sentences, and I have done.

1. I earnestly urge builders individually and collectively to do their best to put an end to such a state of things by rejecting all quantities that show on their face they are not genuine and are the work of unqualified persons. If an end be put to the demand for such quantities the supply will cease.

2. Insist upon the quantities being the basis of all contracts.

3. This Association should at an early date calmly consider the question as to whether it is practicable, in conjunction with architects' associations, to agree to some line of action, whereby impostors calling themselves "surveyors" can be weeded out and prevented from following the profession of quantity and measuring surveyors; and that all men undertaking such work should, by some effectual means, qualify themselves, by licence or diploma of some kind, to prove their fitness for the duty. I understand some such plan is prevalent in Scotland, and it would be well if we could ascertain what the practice is in France, Germany and Belgium.

With a view to remedying the great evil which I have thus but imperfectly described, and which is known to all builders as a most grievous evil they labour under, and which has, in hundreds of instances, caused the ruin of builders of small capital, when they have been powerless to help themselves, I have penned these remarks.

CHIPS.

The memorial-stone of the new public-hall, now in course of erection in Fore-street, Devonport, was laid on Wednesday week. Under the large concert-room will be six offices or shops facing the street, and beneath are four sets of vaults, all of which will be let off. The contract for erection has been taken at £8,100, but the cost of purchase of leases, furnishing, and architects' fees will bring the total expense to about £10,500. Mr. Samuel Knight, of Cornhill, London, is the architect, and Mr. James Matcham, of Plymouth, the contractor.

A new mission-hall, &c., at Birkenhead, and in connection with the Grange-road Presbyterian church of that town, was opened on the 1st ult. The new buildings, which consist of large hall, with open-timber roof, entrance porch, class-rooms, and keeper's residence, have been erected by Messrs. Nickson, of Seacombe, from the designs and under the superintendence of Messrs. Muirhead and Baldwin, architects, of Manchester.

The Cork Gas Consumers' Company have adopted a report and plans by Mr. George Anderson, C.E., their engineer, for the partial reconstruction and enlargement of the older portion of their works.

At the recent annual meeting of the trustees of Bishop Monk's Horfield Trust, the following grants were made for building or repairing glebe houses:—St. Matthew's, Kingsdown, £300; Bishopston, Wilts, £200; St. Michael's, Two-Mile-hill, £60; and St. Luke's, Barton-hill, £60.

The Epsom highway board on Wednesday week increased the salary of their surveyor by £50 a year.

For the vacant office of the surveyor to the local board of Aldershot, 108 applications have been received.

A church-clock striking the quarters, and made by Messrs. Thwaites and Reed, of Clerkenwell, has just been placed in the parish-church of West Clandon, near Guildford, as a memorial to the rector's wife.

The foundation-stone of a new coffee-tavern, now being erected in North-street, Guildford, was laid on Wednesday week by the Earl of Guildford. The building, which will be known as the "Royal Arms," is being built of local bricks, and will contain, in the basement, kitchen and offices, with youths' recreation room; on the ground-floor a long bar-room, with bagatelle and billiard-room, dining-room for commercial men, and manager's rooms; on the first floor will be an assembly room, and four bedrooms for commercial men, and over these, other bedrooms for working men, and a lodgers' library. The total cost will be £2,000; Mr. A. B. Harding is the architect, and Mr. Henry Shaw the superintendent of works.

Mr. F. W. Waller, of the firm of Waller and Sons, architects, of Gloucester, has been appointed Lecturer on Building Materials and Construction, at the Royal Agricultural College, Cirencester.

On Thursday, the 5th inst., at the West Riding-court, Bradford, Joshua Taylor, builder, of Oxendon, was fined 5s. and costs, for erecting stables not in accordance with the plans which he had deposited with the Denholme local board.

A new mill at Halifax, built for the Halifax Flour Society, Limited, was opened on Saturday week. It is erected on the Bailey Hall Estate, and has at present 30 pairs of stones fixed, but these will soon be increased to 50, and there are also warehouses and other premises. They have been in course of erection since 1877. The chairman of the board of directors mentioned that the estimates for the new premises amounted to £10,000, and the extras would be less than £200. The architect was Mr. Richard Ho sfall, of Halifax.

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ILLUSTRATIONS.

ARTISTS' HOMES: MR. J. C. DOLLMAN'S HOUSE AT CHISWICK. — PLACE HOUSE, FOWEY. — CHATEAUX OF THE LOIRE. — DESIGN FOR A GAMEKEEPER'S COTTAGE. — A ROMAN CATHOLIC SANCTUARY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES: NO. 6.—MR. J. C. DOLLMAN'S HOUSE, CHISWICK.

The examples which we have thus far illustrated of "Artists' Homes" have all been more or less of an extensive character. Although our primary intention, in giving this series of artists' residences and studios, was to illustrate those chiefly of our leading painters, sculptors, and architects, yet we had no idea of alone confining our drawings to houses strictly of this class. Such buildings must, of course, possess an interest peculiarly their own—often, indeed, from the celebrity of their owners, rather than from the architectural merit of the particular house illustrated. The houses, however, which will always have a more general value to the major number of our readers, will necessarily be those of a less costly plan, and thus well-within the reach of most of that large class included under the title of artists. Of this more limited character of building is the house, with studio, for Mr. J. C. Dollman, which we illustrate by a double-page plate to-day. The building is simply one of a pair built in Newton Grove, Bedford Park, Chiswick, on the old orchard site; and, as an example of architecture, may be taken to be as unpretending and as inexpensive as it can possibly be, depending entirely upon the common-sense convenience of its interior arrangements, and picturesque proportions of its elevation for all the effect which has been aimed at. The almost universal requirements of economy and limited area of site were in this case a very primary consideration, and for this reason two houses were determined upon, in order that the most might be made of both the individual plots on which the houses stand, by placing the buildings together in the centre of the combined areas, instead of each house in the middle of either, while another important stipulation was to preserve as many of the standing and thickly-placed trees as possible. The studio here, as in all painters' houses, governs the planning of the house; and, to avoid the foliage on every side, as well as for questions of economy, this apartment has been arranged on the first floor, and is reached from a roomy proportioned hall by an easy and wide staircase, immediately approached from the entrance door, so that visitors need not necessarily be brought into the more strictly private part of the house. A models' stair is arranged in the rear, with shelves for plants beyond, and a glass house over, for the purpose of painting with open-air effects from the model. A balcony is arranged over the dining-room bay for the painter's use, when requiring a brief release from the confinement of the studio, and another is arranged with a south-western aspect, for use in chill and early spring weather. The large gable window, which constitutes the chief means of lighting the studio, directly faces the north, and for top-light effects, a skylight is contrived, with shutters to be used when such a flood of light is not required. On the ground floor, a dining-room, 20ft. 6in. by 15ft., is provided, with a garden door conveniently arranged, and a serving hatchway from the kitchen. The drawing-room is 18ft. long and 13ft. 6in. wide. A good storeroom is placed next the staircase, and the kitchen, which is 17ft. 6in. by 12ft. 6in., is well screened from the hall by a curtained lobby. The scullery and offices are beyond. On the first floor, besides the studio, which is 26ft. 6in. by 19ft., two large bedrooms, with bathroom and w.c., are arranged, similar rooms being repeated on the next, or top, floor. The other house possesses a south-west and south-east aspect, with a commodious hall and staircase, large reception-rooms, and convenient arrangements on the first and second floors. The materials used are red bricks for the walls, with cut brick arches and sills, pilasters, and strings. The cove and front gables are finished in plaster of grey lime, having a drying colour of creamy white, and Mr. Dollman intends to personally enrich the gables with scratched ornament, after the manner shown. The roofs are covered with tiles, like the gables, and a feature in the composition of the design is made of the arrangement of the chimney-stacks. The external woodwork is painted a creamy white. The architect, from whose designs and under whose supervision the work is being executed, is Mr. Maurice B. Adams, A.R.I.B.A., of Bedford Park, Chiswick. Our next artist's home will be that of Sir Fredk. Leighton, P.R.A., including illustrations of his celebrated Arab Hall, of which drawings were exhibited this year at the Royal Academy.

PLACE HOUSE, FOWEY.

Fowey is about 25 miles below Plymouth; it has a fine church, of which the tower, somewhat similar in style to the present subject, was illustrated Nov. 30, 1877, and its rich font, Nov. 24, 1876. The accompanying drawing is only of a small part of the house, not more than a quarter of the extent of the front being shown. "The Place" occupies the site of the Kune's Court, the reputed palace of the Earls of Cornwall. At the time of the French assault on the town in 1457, "the wife of Thomas Treffry," according to Leland, "with her servants, repelled their enemies out of the house, in her husband's absence; whereupon he builded a right faire and strong embattled tower in his house, and embattled it to the walls of his house, in a manner made it a castle, and unto this day it is the glory of the towne building of Foey." The tower is 108ft. high. The Place was carefully restored by the late Mr. Joseph Treffry (né Austen, the representative through the female line of the ancient family), and the late owner, the Rev. Dr. J. E. Treffry, also an antiquarian, who died a few weeks ago on board the yacht in which he spent much of his later years.

THE CHATEAUX OF THE LOIRE.

For descriptions of these sketches, see article on p. 174.

DESIGN FOR THE INTERIOR OF A SANCTUARY.

This drawing is a preliminary study for the chancel of a Roman Catholic church, proposed to be erected in a suburb of London, and is designed with a special view to the ritual and requirements of the present day. The architect is Mr. S. J. Nicholl, of 1, Caversham road, London, N.W.

"BUILDING NEWS" DESIGNING CLUB.—A GAMEKEEPER'S COTTAGE.

A gamekeeper's cottage affords one of the most favourable occasions for picturesque design, and we think "Alfred" has succeeded in producing a design quite equal to the occasion. We publish illustrations of his plan, which we have selected for the first place in the competition, herewith.

◆

A new memorial window of stained glass has just been placed in the eastern part of St. Andrew's Church, Derby. The two chief lights contain as subjects the Fall of Man, Moses and the Burning Bush, and the Annunciation and the Nativity, and in the Sexford rose head are types of the six days' work of creation. The window is in the 15th-century style, and is from the atelier of Messrs. Lavers, Barraud, and Westlake, of London.

ARCHÆOLOGICAL.

Ancient Tombs in Switzerland.—An interesting find of ancient tombs, supposed to have formed part of a Burgundian burying-ground, was made a short time ago at Assens, a village of Canton Vaud. These tombs, which follow each other in regular order, are hollowed out of the rock on a hill at the entrance of the village about 3ft. below the soil. They are each two mètres long and 80 centimètres wide. At the head of each grave is a flat stone, dressed, but bearing no inscription. The bones are disposed in the ordinary way, as if the bodies to which they belonged had been laid down in a horizontal position, and not vertically, as in some tombs lately opened at Chamblandes, in the same canton. Fragments of tibiæ, femurs, and the clavicles were found, but no skulls. One of the tombs contained the bones of an adult and an infant, presumably of a mother and her child. Among the objects found are pieces of curiously-wrought and chased metal and silver rivets, the remains, probably, of a warrior's glaive and sword-belt. In another of the tombs was a bell-mouthed vase of the capacity of half a litre, black as to its exterior, but in substance yellow. Whether the material of which it is composed be stone or burnt earth has not been determined. Inside as well as outside there are traces of lozenge-shaped figures executed apparently with some graving tool. The chief interest of these tombs consists in the fact that they are almost certainly coeval with the arrival of the Burgundians in the Jura country in the fifth century, whither they were called by the aboriginal inhabitants to repeople the land, almost depopulated by an invasion of the Alemanni. Being for the most part shepherds and hunters, they dwelt chiefly on the mountain slopes and in elevated valleys. The plateau of Mount Jorat appears to have been one of their most important settlements, and there can be little doubt that the origin of Assens, as well as of Cheseaux, where also Burgundian tombs have been found, dates back some 1,400 years.

COMPETITIONS.

Halifax Higher Board School. — At a special meeting of the Halifax School Board, held on Tuesday, it was decided to invite plans in competition for a Higher Board School, for 250 boys and 250 girls, from the following three local architects, or firms of architects:—Mr. Richard Horsfall, of Halifax; Messrs. Jackson and Longley, of Bradford; and Messrs. Leeming and Leeming, of Halifax.

St. Matthias (Upper Tulse-Hill) Church Competition.—The Rev. John T. Gadsdun writes us: — "Will you allow me, through the medium of your columns, to inform the gentlemen who kindly competed for St. Matthias Church, Upper Tulse-hill, that the motto of the design placed first by the committee is a Red Cross in a Circle, and the architects are Messrs. Harnor and Waters, John-street, Adelphi?"

CHIPS.

St. Mary's Church, Sowerby, was reopened last week, after renovation and decoration carried out by Mr. Jonas Bains, of King Cross, near Sowerby.

The foundation-stone of a new Baptist chapel was laid on Saturday week at Primrose-hill, near Huddersfield; it will measure 57ft. by 45ft., and will accommodate 700 persons, at a cost for erection of £4,000.

The annual meeting of the Sussex Archæological Society was held at Boxgrove this week, where the church was to be described by Mr. Lacy Ridge, architect. In the afternoon Halnaker and the Duke of Richmond's seat at Goodwood were to be visited.

Mr. Benjamin D. Frost, civil engineer, under whose supervision the Hoosac Tunnel was constructed, died at St. Louis, Mo., July 19. Mr. Frost was a resident of Massachusetts, but had been in the West several months prosecuting surveys for the improvement of the Mississippi River, in which work he was actively engaged to the end. He was within a few years of completing his fiftieth year.

A new fish-market, erected by Lord Bute, was opened on Wednesday last at Cardiff.

The will of the late Mr. J. R. Planché has been proved by Mr. S. I. Tucker, his sole executor and successor in the office of Somerset Herald, the personal estate being sworn under £1,000.

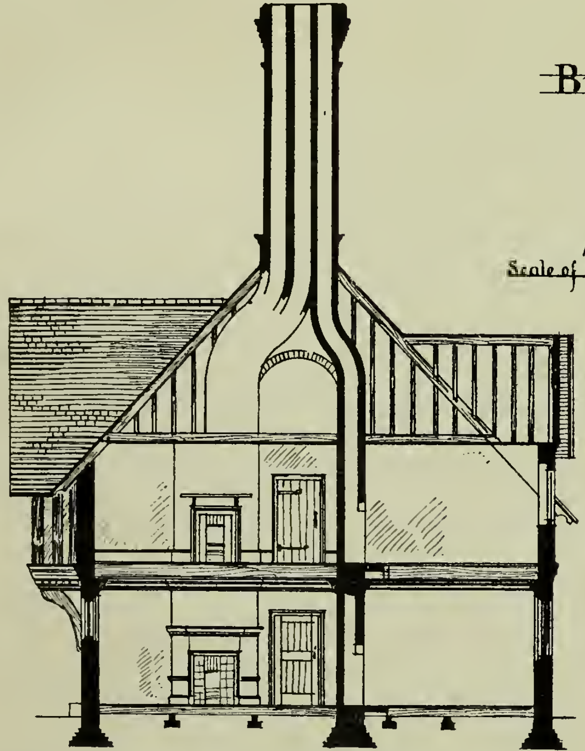
Building News Designing Club:

Design for a Gamekeeper's Cottage.

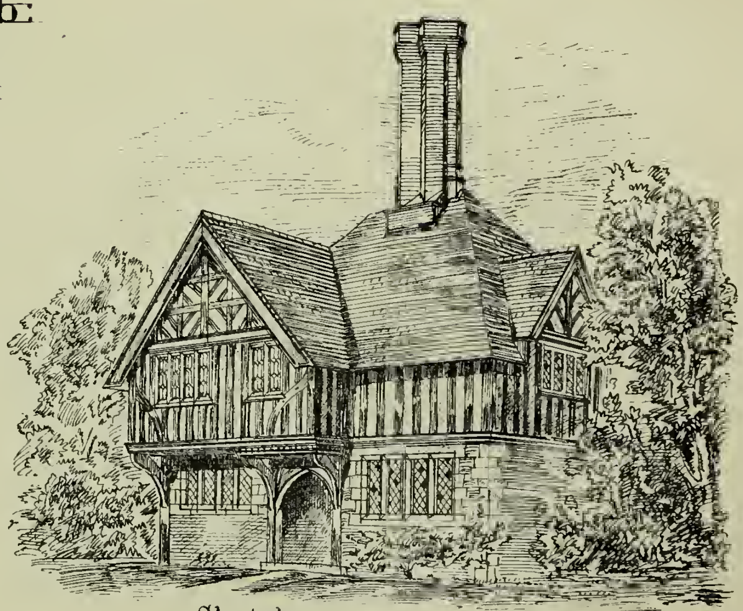
"Alfred"

Scale of 10 5 0 10 20 Feet

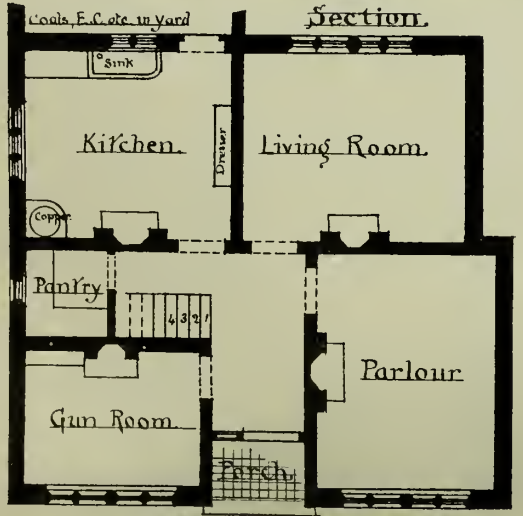
SELECTED DESIGN



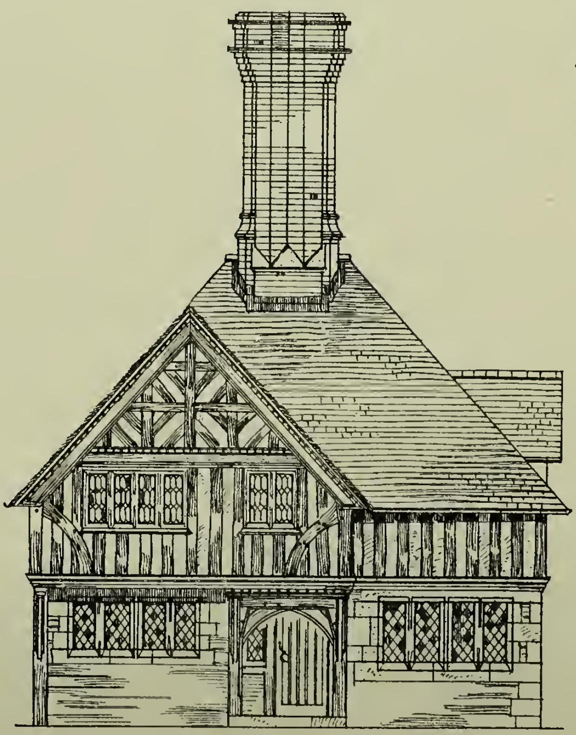
Section.



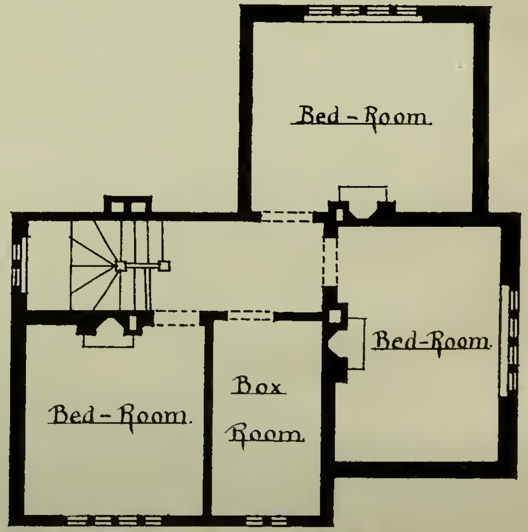
Sketch.



Ground Floor Plan.



Elevation.



Bedroom Floor Plan.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

THE BUILDING NEWS, AUG. 13. 1880.

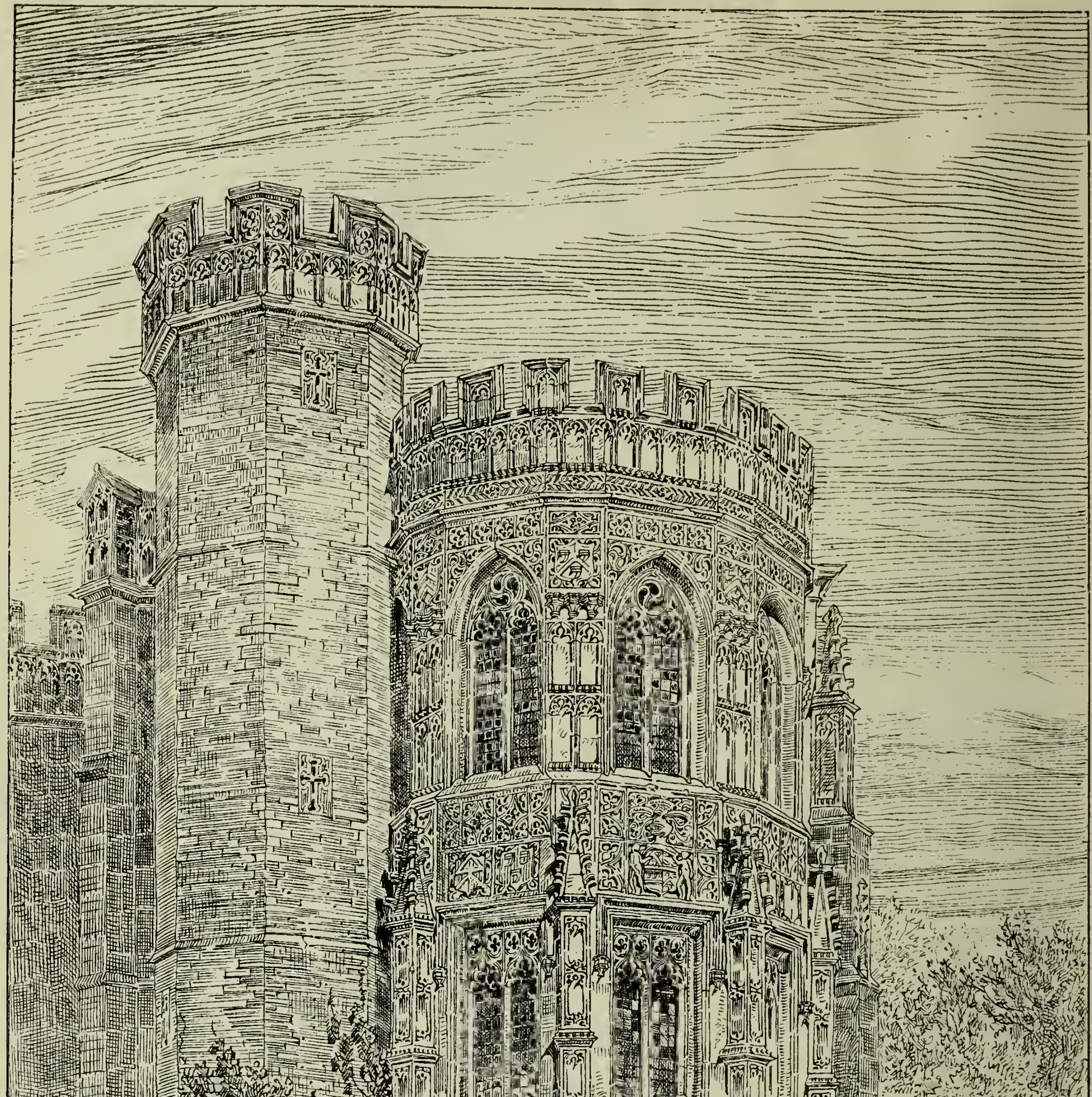
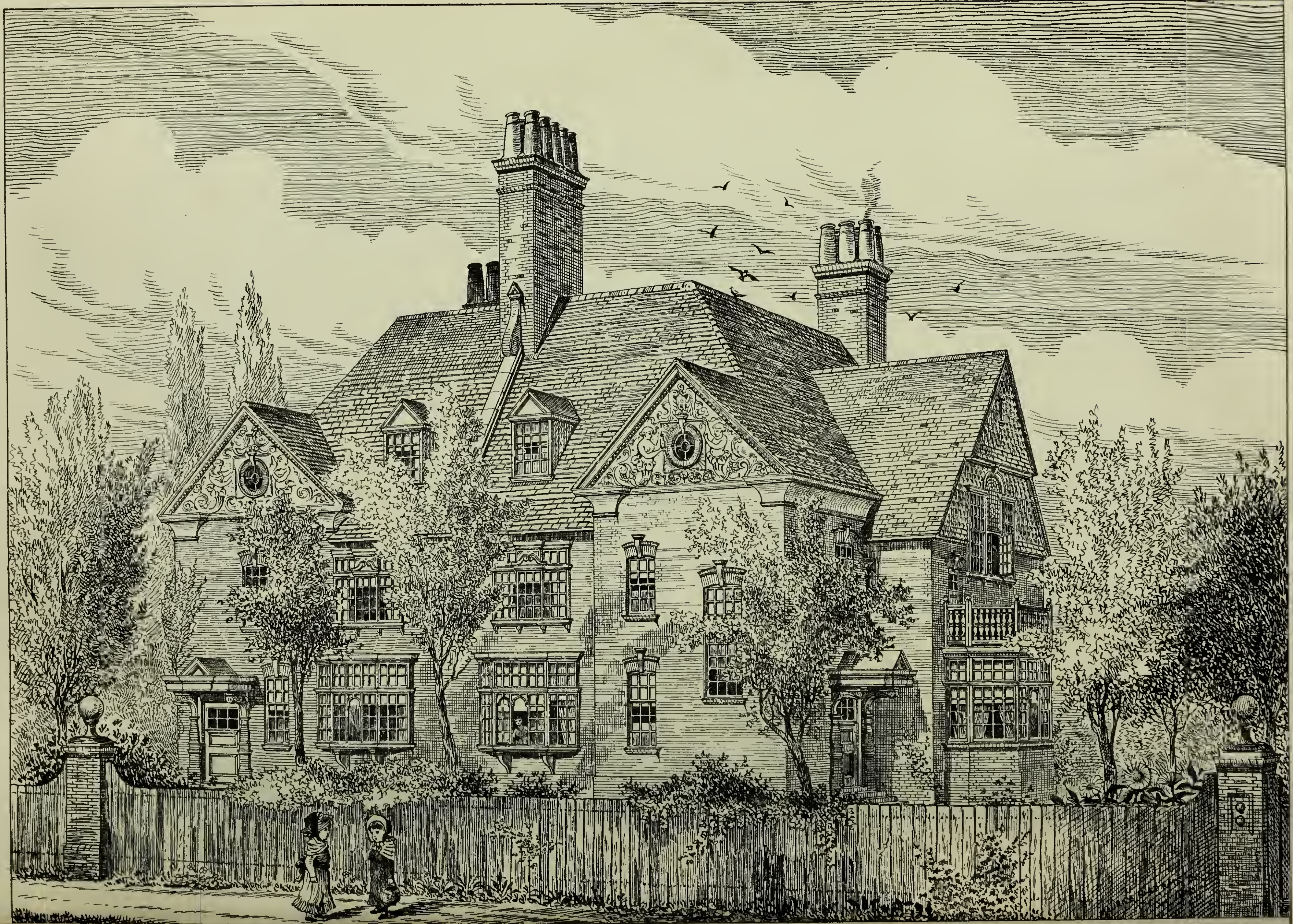


Photo-Lithographed & Printed by James Akerman, 6, Queen Square W C

PLACE - HOUSE - FOWEY - CORNWALL



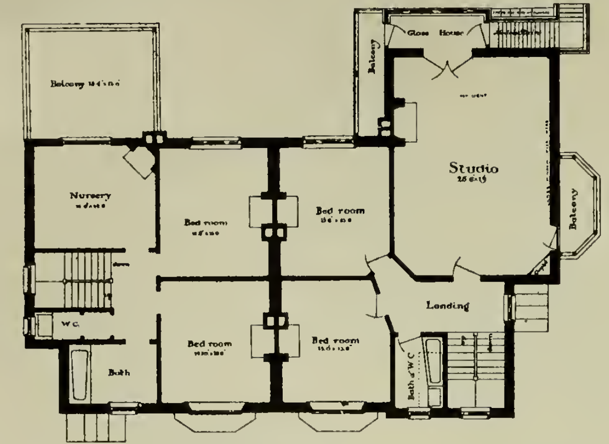
ARTIST'S HOMES Nº 6

MR J. C. DOLLMAN'S HOUSE

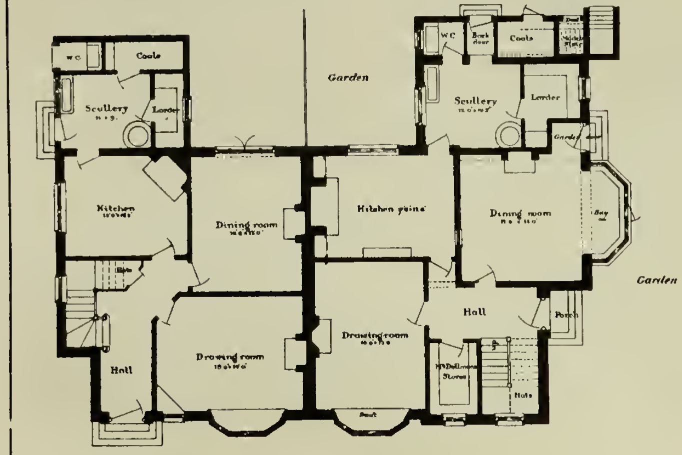
Newton Grove · CHISWICK ·

Bedford PARK

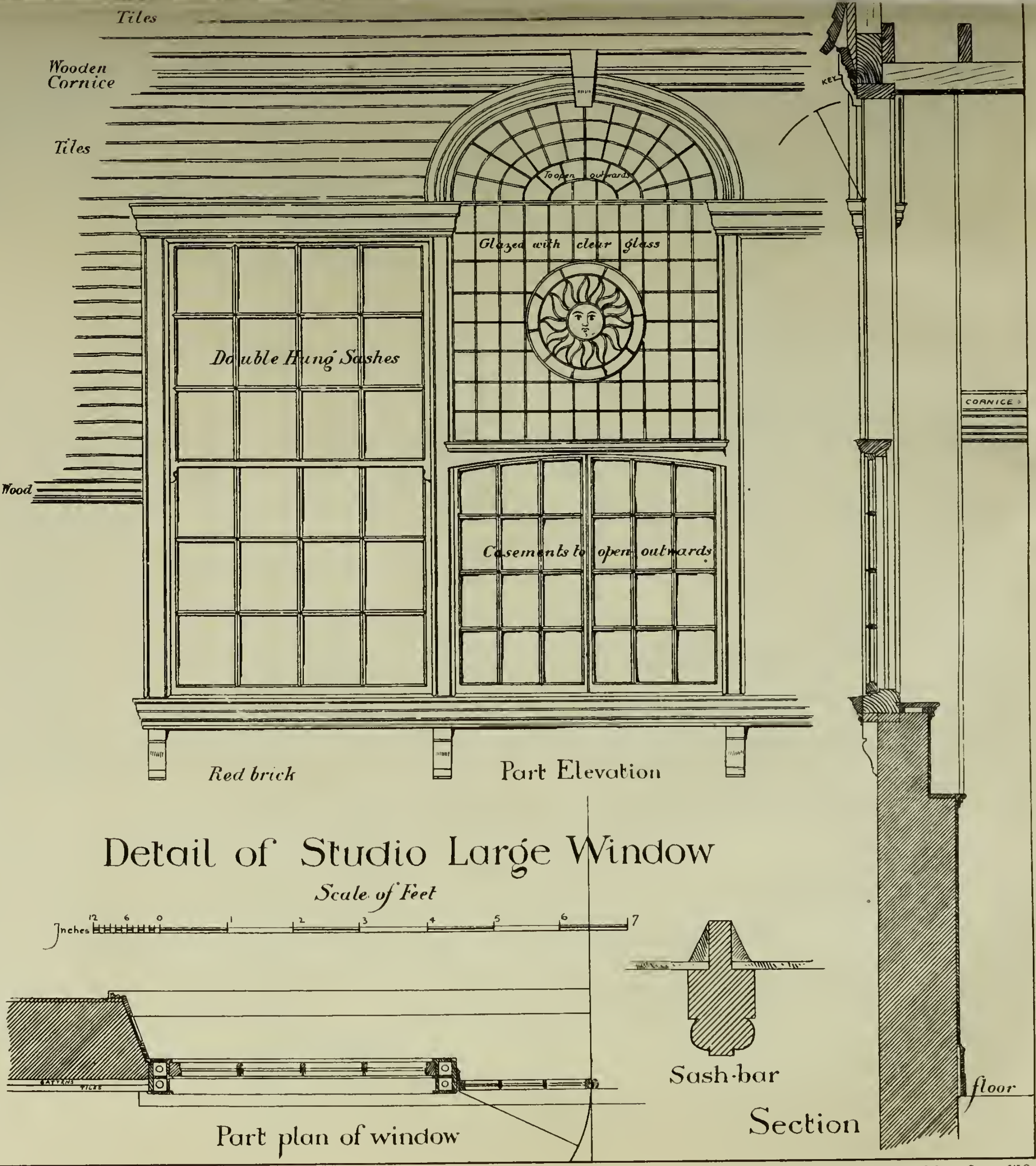
Maurice B. Adams A.R.I.B.A.
· Architect ·



FIRST · FLOOR · PLAN

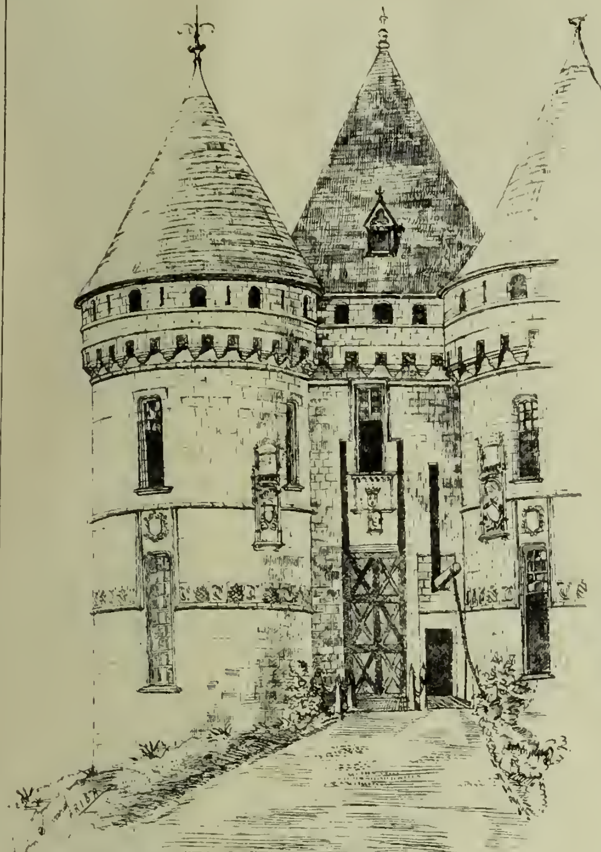


· GROUND · PLAN
Scale of feet ·

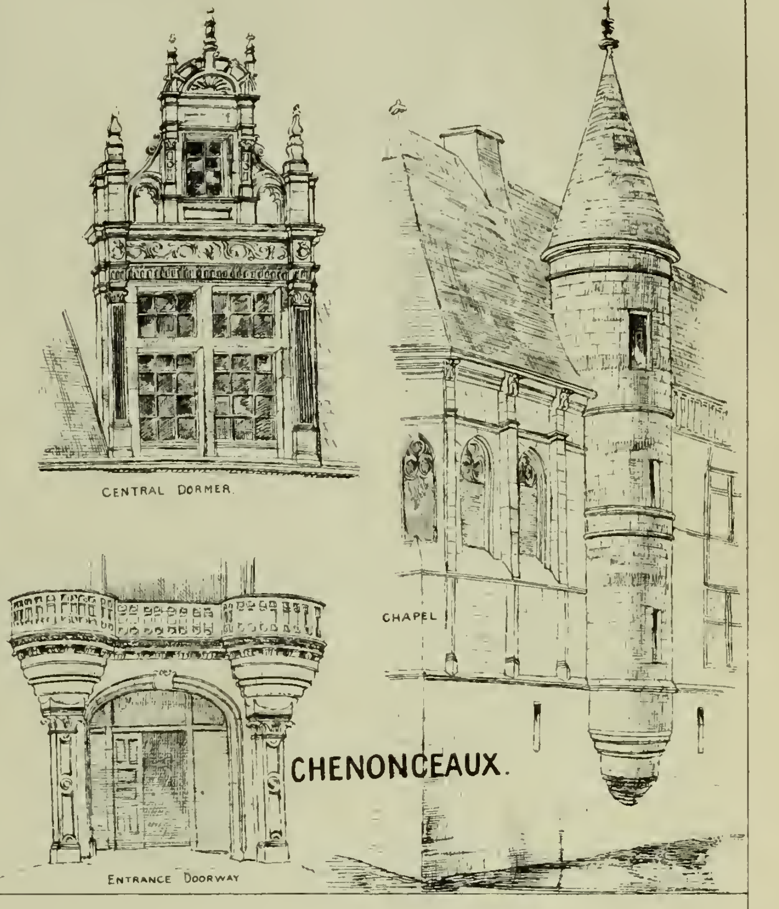


Detail of Studio Large Window

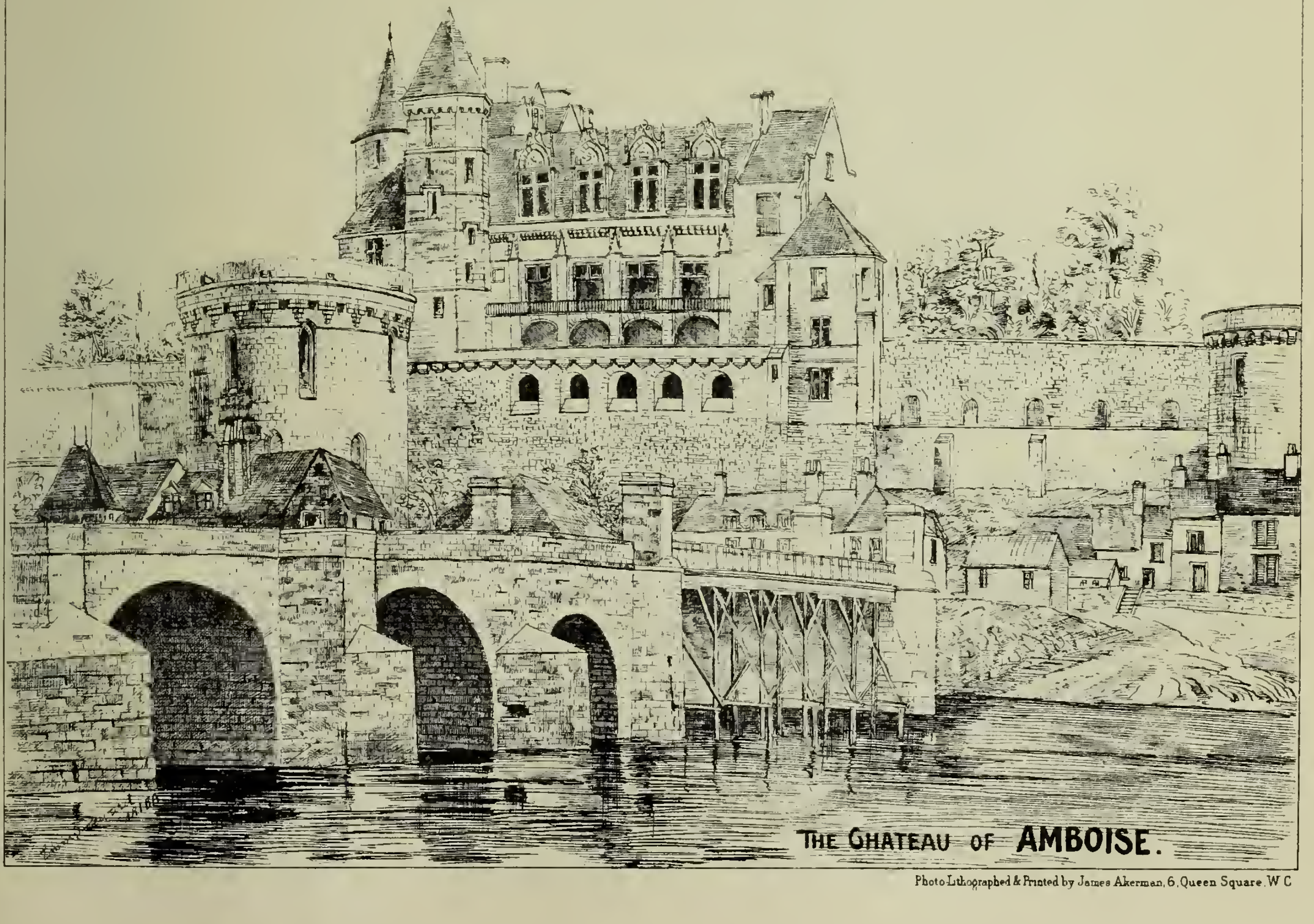
Photo-Lithographed & Printed by James Akerman, 6, Queen Square. W.C.



CHATEAU OF CHAUMONT.



CHENONCEAUX.



THE CHATEAU OF AMBOISE.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

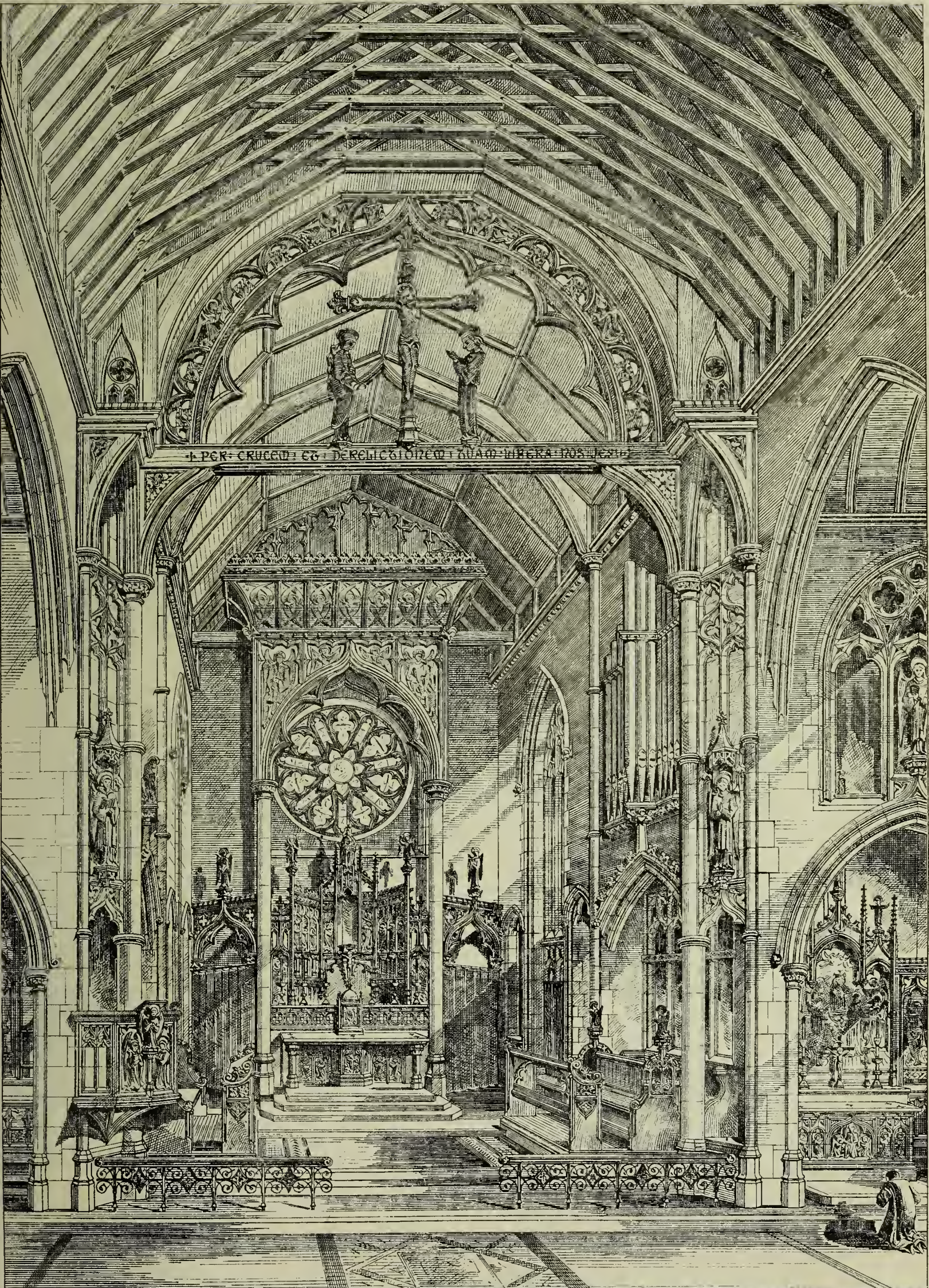

+ PER · CRUCEM : ET : DERELICTIONEM : TUAM · LIBERA · NOS · JESU
S. J. Nicholl Arch.

Photo Lithographed & Printed by James Akerman, 6, Queen Square. W C

A ROMAN CATHOLIC SANCTUARY

BY S. J. NICHOLL, ARCHITECT

THE ARCHÆOLOGICAL INSTITUTE AT LINCOLN.

THE Archæological Institute, which held one of its earliest and most successful meetings at Lincoln in 1848, has just been repeating its visit to that city, under the presidency of the Bishop of Lincoln. We have not attended the meeting either this year or last, the facilities afforded in former years, and still afforded in the case of the sister association, whose meeting next week at Devizes we hope to report, not having been vouchsafed. The following *résumé* of the proceedings is mainly gathered from a very well written summary in the *Guardian*. The proceedings opened on Tuesday, July 27, when the Bishop then took the chair as local president, and delivered an opening address. The reception over, the President and members of the Institute repaired to the New Corn Exchange, where they were entertained at luncheon by the Mayor and Corporation. This official banquet was succeeded by a visit to some of the more interesting archæological remains in the lower part of the city, under the guidance of the Bishop of Nottingham and Precentor Venables, embracing the churches of St. Mary-le-Wigford and St. Peter-at-Gowts. The towers of both these churches, though actually erected after the Conquest, are excellent examples of præ-Norman architecture. They are tall, slender, unbuttressed structures, battering as they rise, the coupled belfry-windows supported by mid-wall shafts, an English version of the Romanesque campanile of Italy—in the words of Mr. E. A. Freeman, "as much at home on the banks of the Adige as on that of the Witham." These towers have been attributed by Mr. Freeman to one "Colswegen," a Dane, to whom, according to *Domesday*, the Conqueror made a grant of land "below-hill," on which he erected houses and two churches. But an Anglo-Saxon inscription, occupying the pedimental head of a Roman sepulchral slab built into the west wall of St. Mary-le-Wigford's tower, deciphered by Professor Mullenhof, and read to the members by Prebendary Wordsworth, clearly assigns the erection and dedication of that church to "Eirtig," and Colswegen's claim vanishes. St. Peter-at-Gowts, however, may very possibly have been founded by him. The Early English interior of St. Mary's was visited and duly appreciated, and the excellence of its restoration commented on. The south aisle is a modern addition at the cost of the late vicar, in which, with much wisdom, no attempt has been made to copy the lovely arcade opposite. St. Peter-at-Gowts ("*gowt*" is a local term for a sluice or watercourse, Fr. *egout*) has been less happy in its restoration. The so-called "White Friars" was then inspected. It is an excellent example of a half-timbered house of the fifteenth century, the residence of a well-to-do citizen, with some thirteenth-century work below. The party then moved on to the Hall of St. Mary's Guild, locally known as "John of Gaunt's Stables," one of the most valuable examples of the domestic architecture of the twelfth century to be found in England. In the courtyard behind the hall is an almost perfect and nearly unique specimen of a small Norman house. The whole premises stand in need of some careful conservative repair—*not restoration*. Opposite to this building stood "John of Gaunt's Palace," the residence of his mistress, Katherine Swynford, the ancestress of our present Royal Family and the sister of Chaucer's wife, whom he afterwards married at the altar of the cathedral in which she lies buried. A magnificent Early Perpendicular window (figured by Pugin), now lighting a washhouse, bears testimony to the former splendour of the mansion. It was now time to climb the hill to the castle, to listen to Mr. G. T. Clark's lecture, which, commenced in the lower ward, was finished within the *enceinte* of the keep, which crowns the lofty mound, pronounced by him "the finest example of a shell-keep existing in England." The external walls and gateways of the castle itself he assigned to the Conqueror, the keep being not earlier than Stephen. Mr. Clark called attention to the widely prevailing mistake that the earthworks and mounds here and elsewhere where William is recorded to have erected castles, are of the same date as the masonry they sustain, for they actually represent much earlier strongholds, thrown up by the Anglo-Saxons, of which William took advantage to form his fortresses. Banks of earth of such dimensions would require a very considerable time to settle, and years must have elapsed before they were stable enough to support heavy walls of stone. Mr. Clark pursued the subject at the evening meeting in a paper on "Post-Roman' and English Earthworks," giving a comprehensive view of the whole subject of præ-Norman fortifications.

Wednesday morning opened with a paper by Mr. J. T. Micklethwaite, on the "Growth of a Parish Church." The paper, characterised by extensive and accurate knowledge, careful observation, and sound deductive power, was one of the most real additions to our archæological knowledge afforded by the meeting. The principle which Mr. Micklethwaite laid down as "the key to the history of the development of our parish-churches," from small aisleless structures to the spacious and varied edifices which meet us almost in every village—viz., that they never ceased to be used—is one that explains many difficulties and solves many problems. Wherever they could, our forefathers built outside the existing fabric, and the altar, if moved at all—which was not the case in the majority of instances—was the last thing touched. Western towers, of which only a small percentage are older than the fourteenth century, and the majority not older than the fifteenth, were often built beyond the existing church, which was afterwards lengthened westwards to join them. The north aisle was the earliest, and often the only one built, because the burial-ground was on the south side. The lecturer protested against depriving our churches of "life and human interest" by altering Late windows to suit our modern canons of taste.

Canon Wickenden then read an account of the "Muniments of the Dean and Chapter," and Canon Perry succeeded with a graphic account of the various Episcopal Visitations of the Chapter, from the historical visitation of Groteste, the first on record, to that of Bishop Smith, in the fifteenth century, when the juvenile Dean Fitzhugh's young companions were charged with shooting at the carved work of the cathedral with cross bows, and holding unlawful "commessationes" with cards and dice and strong potations in the "common chamber of the church."

Wednesday afternoon was devoted to an excursion to Gainsborough, where the Institute was received by Sir Hickman Bacon, in the fine old Hall of the Burghs, which is being carefully restored by Mr. Somers Clarke. This mansion is a capital example of half-timbered construction, with a crenellated brick tower, and an elaborate stone oriel to the lofty hall, in which the Institute partook of a well-furnished meal, as Henry VIII., and his frail Queen, Catherine Howard, had done 340 years before, as Lord Burgh's guests. After the meal Mr. Somers Clarke described the architectural features of the mansion, illustrated by a large-sized plan. The party then moved on by Lea and Knaith to Stowe. Here the one object of interest was the noble minster of St. Mary's, preserving traditions, and some assert actual remains, of the church erected by St. Etheldreda's husband, Egfrid of Northumbria, which eventually (according to some historians; but the point is doubtful) became the cathedral church of the Anglo-Saxon diocese of Sidnacester, the mother of Lincoln, burnt by the Danes c. 870. The tower piers and part of the transepts are certainly of præ-Norman building, c. 1040; the nave being the work of Remigius, and the stone-vaulted chancel that of Alexander, Bishop of Lincoln. The admirable restoration of this church, a quarter of a century back, was the first introduction to the diocese of Lincoln of Mr. J. L. Pearson, the now celebrated architect of Truro Cathedral. Wednesday evening was devoted to a conversazione and an inspection of the temporary museum.

Thursday was saddened by the intelligence of the almost sudden death of Mrs. Blakesley, the Dean's lady, who had been entertaining members of the Institute at dinner on Tuesday evening. This caused some alteration in the arrangements—Precentor Venables' lecture on the "Architectural History of the Cathedral," which had been announced for the Chapter-house, being transferred to the Assembly Rooms. The same sad event also interfered with the proposed lecture within the cathedral by the Precentor. At the conclusion of the Precentor's discourse, which was illustrated with most instructive plans and elevations, drawn for a like occasion by the late Professor Willis and Mr. Edmund Sharpe, the members were conducted round the building by Mr. J. H. Parker. In the afternoon Canon Owen Davys brought before the Institute the burning question of the west front of St. Alban's, now threatened by Sir Edmund Beckett. His lecture, which we may probably give later on, was copiously illustrated by drawings from his own and other pencils. Prebendary Scarth's lecture on "Roman Lincoln" was followed by an inspection of the remains of the portico of the Basilica, the Newport gate, and the fragments of the walls, &c. The party was accompanied by Dr. Collingwood Bruce. A large number meanwhile visited the Old Palace, where the ruins were explained by the Bishop of Nottingham.

In the evening the Bishop of Lincoln and Mrs. Wordsworth received the President, Council, and members of the Institute and their friends at Riseholme Palace.

Friday was devoted to a lengthened excursion, embracing several of the parish-churches of South Lincolnshire, those of Grantham, Sleaford, Heckington (where the elaborately-carved Easter Sepulchre, sedilia, and other chancel decorations were the object of much interest), Boston, and Tattershall. The castles of Sleaford and Tattershall were also inspected.

Saturday morning, the promised paper on the "Monuments of the Cathedral," by Mr. M. H. Bloxam, not being forthcoming, a paper was read, drawn up by Mr. Thomas North, on the "Bells of Lincolnshire," and one by the Rev. F. Spurrell, on "An Incident in the Death of King John," which event he showed to have been due to too copious draughts of new cider at Sleaford Castle. At noon an excursion started for Southwell, where the nave of the Minster—the future cathedral of the new diocese—was found in the hands of builders and carpenters, engaged in re-erecting the high-pitched roofs and lofty spires—the latter only removed in 1801—under the direction of Mr. Ewan Christian. Newark succeeded Southwell, where, time being more liberally allowed, Mr. James Fowler very clearly explained the architectural history of the castle—its connection with the history of the county and nation being left without an illustrator—and after a graceful reception by the Mayor at the Town-hall, accompanied by the "loving cup" and other not unacceptable refreshments, the magnificent parish-church was visited, and made the subject of a lecture from Mr. Micklethwaite, tracing the architectural history of the vast fabric with great clearness. In spite of the floods of the Trent, which covered the road to some depth, a number of the members visited Hawton Church, which has just been carefully restored by Mr. James Fowler—so celebrated for its elaborately-carved Easter Sepulchre and other chancel arrangements.

On the return to Lincoln, a paper was read by Canon Wickenden on the "Stalls and Misereres of the Cathedral," the work of Treasurer Welbourn, c. 1370.

On Sunday the members of the Institute remaining in Lincoln attended the cathedral.

On Monday the last excursion was made, including the churches of Navenby, with a Decorated chancel, containing a fine Easter Sepulchre, sedilia, &c.; Welbourne, with an ugly sugarloaf spire, and a fine interior, sorely needing cleansing and refitting; Leadenham, with a well-proportioned spire and noble arcades; Brant Broughton, with a new chancel by Mr. Bodley, and painted glass, and polychromatic decorations of an excellence and purity of taste rarely to be met with; and closing with the Edwardian fortress of Somerton Castle, built by Antony Bek, Bishop of Durham, celebrated as the place of confinement of John, King of France, after his capture on the field of Poictiers, for about seven months, 1359—1360. In the evening the closing meeting was held, when votes of thanks were given to the Bishop of Lincoln, the Bishop of Nottingham, Precentorf Venables, the Rev. G. T. Harvey, and others. We understand the meeting of 1881 is likely to be held at Durham, and that of 1882 at Carlisle.

* * *

The parish-church of Constantine, near Falmouth, which a few years ago was externally restored by Mr. J. P. St. Aubyn, of the Temple, is about to undergo further restoration from the designs of the same architect, at an estimated cost of £500.

The new church of St. Peter, Langdon-road, Upper Holloway, was consecrated by the Bishop of London on Tuesday week.

Building Intelligence.

Aston.—The memorial-stone of the public buildings and free library at Aston, Birmingham, was laid on Tuesday. About two years since, the board advertised for competitive designs for public offices, free library, baths, stabling, &c. The selection of the most suitable design was referred to Mr. Alfred Waterhouse, architect, and on his report in favour of Messrs. Alexander and Henman, architects, of Stockton-on-Tees, and Middlesborough, their design was adopted. Mr. Henman afterwards settled in Birmingham, and he was intrusted with the superintendence of the works. The buildings now in progress consist only of the public offices of the Board and rooms for the free library under one roof. The erection of the stabling and baths is for the present deferred, but will probably be taken in hand at an early date. The present block of buildings will give the following accommodation:—At the angle of the Albert and Witton-roads, with a separate entrance in Witton-road, will be the free library, with a large and well-lighted reading-room, lending-library, and reference-library; the whole having a floor area of over 2,000 superficial feet. The entrance to the public offices in Albert-road gives access through an open porch and vestible to the ground-floor, where are situated the rate-collector's public and private offices, medical officer's room, and public and private offices for the sanitary inspection; also a public waiting-room, lavatories, &c. A stone staircase ascends to the first floor, where are situate the board-room and two committee-rooms over the library department, offices for the clerk, sub-clerk, surveyor, building-surveyor, and the drawing office, as well as another waiting-room for the public lavatories, &c. In the basement is the fire department, with standing-room for two fire-engines, firemen's-rooms, hose-room, &c. The housekeeper is accommodated in the basement and attic, and there is ample store-room for the requirements of the board. Some of the architectural embellishments have had to be dispensed with, on the ground of economy, but a handsome brick-and-stone building will be the result of the present contract. The proposed tower which appeared in the original design has been abandoned for the present, but there is every reason to believe it will ultimately be carried out. The contract has been taken by Mr. William Robinson, builder, of Spring-hill, Birmingham, for £8,270, exclusive of the front boundary-wall. Mr. F. Hulme has been appointed clerk of the works. The buildings are expected to be completed in June of next year.

Kensington.—The new Town-hall for Kensington was opened by the Princess Mary of Teck on Saturday last. The building, which faces the High-street, has been erected from the designs of Mr. Robert Walker, selected in competition and subsequently revised in consequence of the acquirement of the site of two additional houses in Church-court. On the first floor is the vestry-hall, which is 92ft. long, being 45ft. 6in wide and 32ft. high, approached by a grand staircase and having a platform at the east and a gallery at the west end. There are two committee-rooms on the ground and first-floors, each 56ft. by 30ft., and several smaller rooms. The style adopted is Free Classic, and the High-street elevation and the exposed side of the building has been carried out in Portland stone with small columns of polished grey granite. Messrs. Brand and Co., of Manor-street, Chelsea, were the contractors, and the cost has been between £30,000 and £40,000. We illustrated Mr. Walker's design on December 13, 1878, and several of the other drawings and plans submitted in the competition have been reproduced in our photo-litho. pages.

Marston, Lincolnshire.—The parish-church of Marston, near Grantham, was reopened on the 3rd inst. after restoration and the rebuilding of the chancel. Three years ago, when the work was commenced, the roofs were all flat ones, the east window of the south aisle was partially blocked by a brick vault, and a dormer window gave additional light to the nave. The new chancel, built on the old foundations, is in style fully developed Early English, great depth being given to the mouldings and richness to the general treatment; the windows are fitted with stained glass by Messrs. Ward and Hughes, of London, and the paving has been executed by Messrs. Minton Hollins and Co. The new reredos is a memorial to the rector's wife. A stone screen separates the Thorold Chapel from the church. The south aisle, which is of the Decorated period, has been rebuilt and reroofed, the perforated spandrels to the arcade of nave, probably unique examples, being left untouched. The tower and spire have been repointed, and in the tower-arch has been placed a new organ. The works have been carried out by Messrs. Rudd and Son, of Grantham, from the designs and under the direction of Messrs. Kirk and Sons, of Sleaford, at a cost of £2,000. A sentence in the long and apparently inspired report of the reopening service, published in the *Lincolnshire Chronicle*, may be interesting to those members of the Society for the Protection of Antient Buildings who do not see that provincial journal. "The beautiful Early English inner doorway deserves, and we hope will soon have, a porch more in character with the rest of the fabric than the Late Perpendicular one which now covers it; but the whole undertaking as it stands is an example of thorough restoration creditable alike to the parish and the diocese."

SCHOOLS OF ART.

Crystal Palace School of Practical Engineering.—The certificates were distributed on Saturday to the successful students in the School of Practical Engineering connected with the Crystal Palace Company's School of Art, Science, and Literature, which has now completed its twentieth session. The report of Mr. R. Price Williams and Mr. R. Hedson, the examiners, was to the effect that the work in the several mechanical departments has been exceedingly good, both in general execution and in detail, it being worthy of remark that a special point had been made of economical training in reference to cost of labour in manufacture, erection, &c. It was pleasing, and at the same time surprising, to find so much real, efficient practical knowledge imparted to the students in so short a time. The examination of the second and third term civil engineering students gave results which, in many other cases, confirmed the indication by marks given at the lectures. The calculations of strains in the various designs for girder-bridges, &c., were very satisfactorily worked out by the third and final-term students, who had also executed the drawings of the bridges in very finished style. The work done in the Colonial section had been such as would prove of great use to intending colonists. The examination also bore testimony to the skill and judgment shown by the principal (Mr. J. W. Wilson), and the vice-principal (Mr. J. W. Wilson, jun.), in their judicious direction of the professional education of the students. Of the 33 students who attended the lecture on "Railway and Dock Work," 28 were eligible for examination, and of these 20 passed in a satisfactory manner.

CHIPS.

The board of management of the South Metropolitan School District have adopted plans prepared by their architect, Mr. Wallen, of College-street, Dowgate-hill, for the extension of the north end of the schools at Sutton, Surrey.

An inquiry was held at Rugby on Thursday week, before Mr. Arnold Taylor, inspector of the Local Government Board, into an application by the Rugby local board for sanction to borrow £1,800 for sewage works and street improvements. The inspector intimated that sanction would be readily given, as the objects for which the loan is asked are works of necessity.

The death is announced of Mr. W. Moseley, of Cumberland-terrace, Regent's Park, the architect of the Westminster Palace Hotel and many other important works, and the district surveyor of West Islington. Although he had attained his 82nd year, Mr. Moseley was, until quite recently, active in the discharge of his duties.

By the fall of a party-wall at Devonport, on Thursday week, several men received serious injuries and narrowly escaped with their lives. The accident occurred in a row of houses in course of erection near Higher Portland-place, Stoke-next-Devonport, of which Mr. Wm. Rowe, of Portland-buildings, is the builder, and resulted from the overloading with materials of a scaffold fixed in the new masonry of the party-wall, and in the fall the masonry and men at work on it carried away the joists of a floor below.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Constant Reader. (There are no builders. The work is being done by a staff of men employed directly by the clerk of works, under the architect.)—J. W. R. (Write the secretary, 12, Great George-street, S.W.)—S. W. G. (At Batsford's, 52, High Holborn, if anywhere.)

Correspondence.

IMPROVEMENTS IN BLOOMSBURY.

To the Editor of the Building News.

Sir,—In your review of the above in last week's impression, I venture to think that the two blocks of buildings in Theobald's-road, now being erected from my designs, are therein criticised in an unjust manner. In the first block, a portion of which will be the "Spread-Eagle" Tavern, the canted corner is to receive, in its blank space or panel, tile work or boards painted with sign, &c., and the "amazing" finish, or pediment will, by its projection, protect the tile work, &c., from effects of the weather.

Had your critic first made himself acquainted with the conditions under which I am working, I feel sure that he would have modified the other remarks he has made on these buildings. As to the second block, whilst appreciating his remarks, I am amazed at his description of the ornamental panels as "impressed cement," whereas they really are cast brickwork. There is no cement used in the fronts nor stock bricks, the facings being of white Suffolks and malms.—I am, &c., J. W. Brooker.

2, Railway-approach, London-bridge, S.E.
Aug. 10.

LONDON BRIDGES AND TOLLS.

Sir,—Many of your readers will be surprised at your remarks from the *Echo* on the above subject.

It is a great boon to the public to have the bridges over the Thames and roads leading thereto free of toll. The efforts of the Metropolitan Board of Works to do away with the tolls on bridges and roads in and around London, notwithstanding the large amount paid, are fully appreciated; nevertheless, I wish to call attention to the Deptford-road-bridge, or rather the road from the common ferry near the said bridge.

It seems to myself, and others, an oversight that the Deptford-road bridge should be made free of toll, and that the toll for landing on the Middlesex side of the river from said Deptford-bridge-road, and the tolls on the West Ferry-roads, Isle of Dogs, in connection with the common ferry, should still be unrepealed.

In the year 1812, an Act was obtained for the establishment of a common ferry from Greenwich, in the county of Kent, to the Isle of Dogs, in the county of Middlesex, consisting of—"one or more boat or boats, or such other vessels as shall be sufficient and proper for the passage and conveyance of horses, carriages, &c., &c., from or near a place called the Wood Wharf, Greenwich, to the opposite shore, near to a place called the Ferry House in the Isle of Dogs marsh"—and tolls were granted for the same.

On examining the Act (52 Geo. III., cap. 148), it will be found that the company called the Poplar and Greenwich Ferry Company was formed, and in consideration of receiving power to charge tolls, they undertook to, and did, establish a common ferry over the river Thames from Greenwich, in the county of Kent, to the Isle of Dogs, in the county of Middlesex; and they also undertook to make, pave, maintain, and keep in repair a convenient road or carriage-way from the Wood Wharf aforesaid to the road leading from Deptford Creek-bridge, &c., &c.; and also a convenient road or carriage-way on the Middlesex side, leading to the Thames or ferry aforesaid.

These roads were made, and for some time maintained, so as to obtain better access to the said common ferry.

The common ferry for conveyance of horses, carriages, &c., from Greenwich has been for a long time abandoned, and the toll-gates near the Wood Wharf on the Greenwich side, leading to Deptford Creek-bridge-road, have been moved, so that, as I have said, it appears to be an oversight that the toll for landing on the Middlesex side should still remain, and that tolls should still be collected on the roads leading to said common ferry.

Efforts have been made from time to time to remove these tolls, hitherto with no effect. It is to be hoped that the Metropolitan Board of Works will include these tolls in their present large expenditure, and so abolish one of the remaining nuisances existing in and around the metropolis.—I am, &c.,

Samuel Trickett.

IRON IN CEMENT.

Sir,—After a careful examination of a variety of Portland cements from different districts, manufactured under wet, semi-wet, and dry processes, I find the quantity of iron very limited indeed. The quantity of metallic matter withdrawn from the cement ranges from 0·75 per cent. to 0·168 per cent. The largest amount I was able to extract was from "Magnet's" 2 A sample sent to you.

On a careful chemical analysis of the metallic matter, it is found that about 0·43 per cent. of it is only iron, the bulk being silica, alumina, oxide of iron, &c. The oxide of iron appears to be magnetic in character, but there is not enough of *real* iron to warrant the consumers of Portland cement in being alarmed, unless they should be foolish enough to buy the "patent iron cement" from "Magnet's" merchant. I am still of opinion, therefore, that the original sample sent to you was *ground iron*, and resulted from the cause I imagined.

There is much interesting detail resulting from my study of this new craze, but it is too lengthy to trouble you with. I trust, however, that "Magnet" will be satisfied with those results I have reached, but I shall be glad to give him further information should he desire it, if he applies to me.—I am, &c.,

Henry Reid.

PINHOE CHURCH.

Sir,—The description of this church is not correct. No mention is made of my name, who was the only contractor for the entire works. The carving and tracery was done by my own man, Mr. Gush. Mr. James O. Fleming is described as clerk of the works, but there was no clerk of the works; a Mr. Finning acted as my foreman and timekeeper.

I purchased the tiles of Messrs. Minton and Messrs. Boote, but they were laid by my men.

The glazing of the chancel and nave was part of my contract, which I intrusted to Mr. F. Drake, Exeter, and Messrs. Pepper and Co., London.

Trusting you will do me justice by inserting this in your next issue,—I am, &c.,

Henry Phillips.

10, Friars-gate, Exeter, Aug. 12.

Intercommunication.

QUESTIONS.

[6193.]—**Glass Staining and Painting.**—Can any reader give me the name of a book upon this subject? Some work giving practical hints as to mediums, fluxes, shading, &c., is what I require.—K.

[6194.]—**Sketching-Tramps.**—Can any of your readers kindly give me hints as to best routes to be taken for Saturday to Monday trips?—C. G.

[6195.]—**Bowling-Alley.**—Required the width and length of an American bowling-alley for private use, also how floor is laid.—Subscriber.

[6196.]—**Old Buildings on the Thames.**—I shall feel obliged if any correspondent can tell me of a few picturesque old buildings, such as an old mill, with trees, &c., in the neighbourhood of the Thames between, say, London and Windsor.—Reader.

[6197.]—**Damp House.**—Will any correspondent suggest a remedy for the following:—The house (an old one) is formed of 9in. brick walls, now covered with ivy. It is well drained, and all the floors are above the ground level. Yet clothes in wardrobe or drawers will be covered with mouldy spots in a few days.—Subscriber.

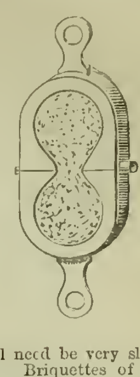
[6198.]—**Girders for Shop-Windows.**—I will be glad if one or more of your experienced readers will favour me with their advice as to the best section or kind of iron girder for use as a lintel over the openings of windows of about seven to ten feet span on ground-floor for tenements of six stories in height. I would particularly wish relative opinion as to wrought iron, cast iron, and flitch beams, for such a purpose, and would feel favoured by the recognised method of calculating the necessary strengths and the best adapted sections. Any recommended publication speedily referring to this application in architecture I would be happy to hear of.—J. M.

[6199.]—**Concrete Houses.**—I employed an architect to superintend the erection of a concrete house, with plate floors and double-concrete roof. He is supposed to be skilful in manipulation of aggregates, and somewhat of an authority on cements (I won't mention name), but he granted certificates to the builder, as high as he could under the contract, and received his own commission, 5 per cent. According to the sworn testimony of the foreman who had to rectify (at my cost so far) the shameful work of that contractor, it was found that the south wall 50ft. long and 20ft. high was 10in. out of perpendicular; none of the walls square inside or out; the openings for doors and windows all out of level (a pretty job in concrete!), and the roof, on which workmen were *trying* to put a very deep concrete Greek cornice, 16½in. out of level. Rectification of these and many more, but minor, performances had to be done with skilled labour, at a vast loss of time, and using 20,000 bricks, some thousands of tiles, and many tons of Portland cement. £400 loss in money expended and in time lost, at least. I shall be greatly obliged if one of the honourable members of the Royal Institute of British Architects will, in your columns, kindly say what is the proper way of dealing with this gentleman, who (impenitent, of course) is himself exceedingly severe in remarks upon other architects. Litigation might not yield fruitful results.—Indignans.

[6200.]—**Painted Brickwork.**—Can any of your readers tell me if it be possible to take oil paint off brickwork, or, if not possible, how I can make it look more like the brickwork (on the same front) which has not been painted? I should prefer not raking out the joints and repointing, because the mortar is very hard. The bricks are ordinary stocks.—C. F. M.

REPLIES.

[6163.]—**Testing Portland Cement.**—A test similar to that afforded by a machine may be secured at a very slight cost by adopting the following:—Procure a mould for briquette, giving 1in. or 2¼in. sectional area as desired, divided transversely as per sketch. The studs shown at the sides are to receive rings, so as to prevent any shifting of the parts while being filled with the cement. When the cement has set sufficiently hard the mould, with the briquette, is placed in water, and allowed to remain the usual time. When to be tested, one end of the mould is suspended to a hook, on the other a box or bucket is hung, and fine sand, iron filings, or ground slag added in a continuous stream until fracture occurs. The weight of vessel and contents will represent tensile strength. The fall need be very slight to prevent contents being upset. Briquettes of any shape can be tested in this way: holes can be formed in the briquettes while moulding, so as to avoid the necessity for immersing the mould in water.—C. W.



[6167.]—**Pitch for Tile Roof.**—A tile roof should not have less than a third of the span. A square pitch is better.—G. H. G.

[6168.]—**Half-Timbered Houses.**—Brick-nogging is not desirable so much where the weight of wall is immaterial, though it is better where thin walls are required. It is not necessary to build in cement, though I should certainly recommend it.—G. H. G.

[6169.]—**Bedroom Chimney Piece.**—The chimney piece may be painted white if the mouldings are plain; but if there are pilasters or columns, or the jambs are in panels, relief could be obtained by the employment of two shades of colour, say two shades of dark green of a sage or bluish tint, or chocolate and black. The panels are best of a darker shade than the stiles of framing, and of course the same rule applies to the panels and doors.—G. H.

[6189.]—**Fifteenth-Century Dr. Tanners.**—Has not "L. R. D." been hoaxed? The *Pall Mall Gazette* of the 5th inst. says:—Dr. Tanner and his friends will undertake a long job if they try to take a note of every figure of this kind—what is technically called an "emaciated figure"—to be found throughout England. But as for taking a note of the fact that any of the persons so commemorated died of trying to fast forty days, that is another matter. It was not uncommon to set up figures of this kind, sometimes alone, sometimes in company with a figure representing the same person in full life. They were meant as an edifying "memento mori," and that was all. But what the mythologists call an "ætiological legend" often arose, and the same silly story was told which is seemingly looked on as something special to Bury St. Edmund's. Sometimes the legend takes another shape, and it is said that the person commemorated died of love. Anyhow, either tale belongs to the class of old wives' fables, which it is strange to see trotted out in the year 1880 as an instance of "things not generally known." Amongst a crowd of others, Bishop Thomas Beckington is commemorated by a figure of this kind in Wells Cathedral; and most assuredly the prudent secretary of Henry VI. did not die of love, nor yet of trying to fast for forty days.—K.

[6189.]—**Fifteenth-Century Dr. Tanners.**—I suspect that the monument to John Baret in St. Mary's, Bury St. Edmund's, is scarcely unique enough to publish, as "L. R. D." suggests, if he would like it so to be, solely because it is surmounted by a recumbent figure of a starved man who, tradition records, attempted to fast forty days. There are similar sculptures to be met with elsewhere; but although popular opinion generally ascribes them to be monumental, the figure in question, like others, is probably a "memento mori," a monitor of life's uncertainty, and a pious and salutary emblem rather than any actual representation of an unfortunate religious enthusiast. There rests, beside the entrance to St. Andrew's Chapel, upon the north side of Exeter Cathedral's choir, a carved stone figure, such as "L. R. D." describes. It lies on a winding sheet, is life-sized, and over it occurs the Latin description: "Ista figura docet nos omnes premeditari qualiter ipsa nocet mors quando venit dominari." Some have erroneously attempted to associate this monument with Bishop Lacy's memory, and in Worth's "History of Exeter Cathedral," recently published, I believe the same error is perpetuated. But Mr. Worth in this, as in some other things, is mistaken. Bishop Lacy (his name is spelt Lacy, Lacey, and Lacie respectively in three old documents I have before me as I write) was, prior to coming to Exeter, Bishop of Hereford. Translated from thence in Henry V.'s time (1420) he raised the Chapter House, glazed the nave windows, and was a great benefactor to the College of Vicars Choral. He died on March 25th, 1455 (Henry VI.'s reign) and was buried in the north side of the choir. His arms are upon the rood-screen, and also appear on shields borne by angels in the tie-beams and wall plates of the Chapter House roof; his memory was for many years commemorated by a brass, which, like a good many other things that were in Exeter Cathedral, is now missing.—Harry Hems.

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At the Sheffield Police-court, on Friday, John Champion Hildrews, described as a builder and contractor, of Sunderland, was committed for trial on a charge of having obtained goods by false pretences by a "long firm" trick.

The Great Eastern Railway Company has let a contract for the supply of 10,000 tons of steel rails, to be delivered in 1881, to Messrs. Wilson and Cammell, of Sheffield. The same company has given an order for 5,000 tons of similar rails to the West Cumberland Iron and Steel Company.

PARLIAMENTARY NOTES.

South Kensington Museum.—Mr. Leeman, on Monday, asked the Vice-President of the Committee of Council on Education whether there existed any list of duplicates of objects of art in the South Kensington Museum; and, if not, whether he would cause such a list to be prepared for the re-assembling of Parliament, such list to be classified, and to give date and country of each example; whether he would cause a report to be prepared, to be presented at the same time, giving a detailed account of the system of circulation of objects of art throughout the kingdom under the Science and Art Department of the South Kensington Museum from its first establishment to the present time, such report to give in alphabetical order the towns to which loans had been sent, how often, and for what periods of time, the number of objects, returns of visitors, and, where possible, the financial results, with any details, extracts from official correspondence, &c., showing the influence of such contributions from national collections in the promotion of local provincial exhibitions and museums; and particulars as to special provisions which had been made for the safe transmission and custody of such loans; and what, if any, arrangements had been entered into with insurance offices for protection against loss by fire. Mr. Mundella: A list of all duplicates of art-objects in the South Kensington Museum suitable for circulation on loans to schools of art, provincial museums, &c., was printed in 1872, and can readily be made complete to the present time. A report relating to the organisation of the system of circulation of art-objects on loan, as carried on by the establishment of the Science and Art Department to the present time, shall be furnished early next Session. Meantime it may interest the House to know that during 1879 collections have been sent to seven permanent museums, including those at Bethnal Green and Edinburgh, and to ten local exhibitions. The number of art-objects lent has been 5,854, and the number of paintings and drawings 2,089. The number of visitors to local museums in the year, excluding Bethnal Green and Edinburgh, has been 581,922. The visitors to Bethnal Green numbered 444,021, and to Edinburgh 647,294, giving a total of 1,673,237. The number of visitors to South Kensington was 879,395, giving a grand total of 2,552,632. The demand for loans of art-objects has largely increased this year, and we are endeavouring as far as possible to meet it.

Duplicate Works of Art.—In reply to Mr. Leeman, Lord F. Cavendish said he had consulted the trustees of the three collections included in the question. With regard to the National Gallery, duplicates of pictures in that collection would, as a rule, be copies, and no such copies had been sold or exchanged; nor were there any in the possession of the trustees. The National Portrait Gallery possessed only one duplicate. The hon. member's questions would, therefore, apply principally to the case of the British Museum, and, looking to the limited amount of the grant which was annually placed at the disposal of the trustees, he thought it would not be advisable to deprive them of the power of selling or exchanging duplicates, exchange or sale being often the only means of obtaining necessary specimens. The power of sale, which was conferred on the trustees by certain Acts of 7th George III., had very rarely been exercised, except for special purposes with the concurrence of the Treasury. With regard to the second part of the question, he was informed that the difficulties of compiling such a return in the case of the British Museum would be very great, owing to the immense number of objects and the necessity of careful comparison of similar specimens before they could be pronounced duplicates; and that the number and value of the duplicate specimens, when such an examination had been completed, would not be at all commensurate with the cost of the labour.

Art Collections in the Provinces.—On Monday, on the vote of £4,693 for the British Museum Buildings, some of the members for large manufacturing constituencies put in a strong claim for the distribution of duplicate specimens among local institutions, and Mr. Walpole promised, in the name of his co-trustees, that the matter should receive consideration.

New Science and Art Buildings.—On the vote of £12,836 to complete the sum necessary for the erection and maintenance of new buildings for the Department of Science and Art, Mr. Rylands moved the reduction of the vote by the sum of £2,000, on the ground that in this vote was included the salary of an officer or superintendent of works whose salary was not specifically stated. This, he said, had continued for six years during the erection of these buildings at South Kensington, representing a total sum of £12,000. He was always under the impression that Government buildings were erected under the superintendence of the Office of Works, and therefore he required an explanation of a matter of which, from the information afforded by the Estimates, he would have known nothing. Mr. Adam said care would be taken in future Estimates to separate items of salary from votes for buildings. He might mention, however, that if instead of General Scott and his staff a regular architect had been employed, it would have cost the country a total additional sum of £3,000 or £4,000. Mr. Mundella observed that it was the late Government who were responsible for this, the present Government being obliged to take the Estimates this year just as they found them. He should add that this sum of £2,000 included work of a structural character done by General Scott—such as mouldings, terra-cotta work, and so forth. The amendment was withdrawn.

WATER SUPPLY AND SANITARY MATTERS.

Godalming.—The waterworks for Frith-hill, Godalming, and Farncombe were inaugurated by Lord Midleton on Wednesday week. They have been constructed for a limited liability company during the past two years, trial boreholes made under the direction of the engineer, Mr. Jabez Church, of Great George-street, Westminster, having proved that an inexhaustible supply of excellent water was to be obtained from the lower greensand. The works are situate at Frith-hill, near Charterhouse, the engine and boiler-house being at the foot of the hill and the reservoir at the top. The contractors for the well and reservoir were Messrs. T. Docwra and Son, of London; the architect for the engine-house, boiler-house, and tower was Mr. C. Forster Hayward, F.S.A., of London; and the builder, Mr. R. Pink, of Milford. The machinery and mains were furnished by Messrs. Young and Co., of London, and the tank and connections by Messrs. S. Cutler and Co., also of London. Mr. H. Caldicott has acted as clerk of works. The engine is a horizontal one of 15 h.-p., and there are three powerful pumps, of which one is a reserve, throwing 7,000 gallons of water per hour. The well is 63ft. deep, and will contain about 40ft. of water while pumping is going on. The smoke is carried away by a tall shaft, placed some way up the hill-side. The reservoir on Frith-hill is 80ft. by 60ft., and 12ft. deep, and is capable of holding 360,000 gallons. It is covered in and ventilated by shafts. Close by is a castellated water-tank, built of Bargate stone and brick, and containing a wrought-iron tank, 15ft. diameter and 19ft. deep, of 28,000 gallons capacity. The rising main is of 6in. diameter.

Liverpool Water Supply.—The City Council of Liverpool decided on Monday, to proceed with the first section of the scheme for a new water supply from Vyrnwy, in North Wales. The scheme is expected to be completed in about five years, and will secure an additional supply of 13,000,000 gallons of water per day to Liverpool. The total cost of the undertaking is estimated at £8,000,000.

The Utilisation of London Sewage.—A Bill with the above object has received the Royal assent. The Dagenham and District Farmers' (Optional) Sewage Utilisation Act authorises the formation of a company and the construction of works for the delivery of London sewage to the occupiers of some 9,000 acres of land on the Essex side of the Thames, between Barking and Wennington. The essence of the project is pointed to in the word "optional" in the title of the Bill. The farmer or market-gardener will draw sewage only when he requires it, and the company will be under no obligation to take the sewage except when they can dispose of it. The Act confirms a 30 years' agreement with the Metropolitan Board of Works, by which, in consideration of a half-share in the profits of the concern (beyond 5 per cent.), the Board undertakes to supply the company with any quantity of sewage up to 60,000,000 gallons a day. The works proposed will be capable of supplying £20-worth of manure, at a charge of about £2, to every acre in the district during the six dryest months of the year. The company will divert the bulk of the sewage from the river, at any rate, during the hottest months of the year.

The Weather and the Subterranean Water Supply.—The rainfalls of this year, according to Mr. Baldwin Latham, are replenishing the earth; those of last year carried the elements of fertility into the drains and subsoil. In June and July of 1879 he recorded 7·39 inches of rain at Croydon. Of this rain he found that 3·95 inches passed through a percolating gauge one yard deep, consisting of soil and chalk, being a section from a Surrey down, and 3·13 inches passed through a percolating gauge of the same depth, consisting of soil and gravel, being a section taken from a Surrey valley. The evaporation in the period from a water-surface, ascertained by means of a gauge floating in water, was 4·95 inches. In the two months of June and July of this year 6·55 inches of rain fell, and no water has passed through either of the percolating gauges, the evaporation from the water-surface having been 6·75 inches. In June and July of last year the evaporation was 31 per cent. less than the rainfall; in the same month this year it exceeded the rainfall. These results are checked by well measurements extending over a large part of Surrey, and which show a gradual lowering of the subsoil water since the 13th of March of the present year, and which still continues. In the new red sandstone formation of Atherstone, and in the oolite formation of Northampton, there has also been a gradual diminution in the subsoil water, with the exception that in the third week in July, during the whole week, there was a very rapid percolation, but it soon ceased, and now the subsoil waters are again rapidly declining.

Slough Sewerage.—This work, which has engaged the attention and consideration of the ratepayers and the Local Board for so many years, has at length been carried to completion. No fewer than six or seven Local Government Board inquiries have been held on the subject of the disposal of the sewage since the question was first mooted. After receiving reports by Mr. R. B. Grantham, C.E., on several schemes, the Board finally, in 1878, determined on the present plan. Since that time the works have been slowly but surely developed. A new system of sewers, about seven miles in length, has been laid throughout the town, storage tanks, an engine-house, and engine driver's cottage have been built; two pumping-engines of ten-horse power each have been erected by Messrs. J. Watt and Co., of Birmingham; a rising main, 2,830 yards in length, has been laid, and a portion of a farm of 25 acres has been laid out for irrigation. The principal feature in the works is the separation of the rainfall and subsoil water from the sewage. The house connections are not yet made, but after careful testing it has been found that the leakage into the sewers at present amounts only to six gallons per minute, or less than one cubic foot, and this notwithstanding that some of the sewers are laid in a soil containing water nearly on a level with the water of the Thames. When the sewage has been allowed to flow down the sewers for some time this volume will probably be diminished. The surface-water drains to carry off rainfall are connected with the town sewers which were laid some years ago. There are probably very few towns in which so little water leaks into the sewers. The works are designed and have been carried out under the superintendence of Messrs. R. B. Grantham and Son, Mr. F. Smith being the clerk of works.

The London Water Supply.—The following is the Report from the Select Committee, of which Home Secretary Sir William Harcourt was the chairman, which was appointed to inquire "as to the expediency of acquiring on behalf of the inhabitants of London the undertakings of the existing metropolitan water companies; and also to examine and report whether certain agreements, or any of them, already entered into provisionally for the purchase of these undertakings, could furnish a satisfactory basis for such an acquisition; and, further, to inquire and report as to the nature and extent of the powers of the water companies to levy water-rates and rents, and how far it may be desirable to modify the same."

"1. That it is expedient that the supply of water to the metropolis should be placed under the control of some public body, which shall represent the interests and command the confidence of the water consumers. 2. That under such management a greater efficiency, economy, and equality of charge than that which at present exists might be secured; the defects in the present provision for the extinction of fire might be remedied; and better provision might be made for the health of the community. 3. That in order to effect the above-mentioned objects, a water authority for the metropolis should be created with statutory powers which will enable such body to acquire and utilise, so far as may be deemed expedient, existing sources of supply, and to have recourse to such other sources of supply, as, upon investigation, may prove to be available and desirable. 4. That in the absence of any single municipal body to which these functions could be committed, a water authority of a representative character should be constituted, and that a Bill having that object be introduced at an early date by Her Majesty's Government. Without absolutely describing the composition of such a body, your committee are of opinion that it should include elements to be derived from the Corporation of London and the Metropolitan Board of Works, together with a due representation of the districts at present supplied by the metropolitan water companies, which lie beyond the jurisdiction of the Corporation and the Metropolitan Board. It is on such a body, when properly framed, that, in the opinion of your committee, should devolve the responsibility of determining questions affecting the source, the nature, and the price of the water supply of the metropolis. The subject is one which especially concerns the consumers of water, and should be left to the judgment of a representative body, furnished with adequate power to give effect to such measures as, on mature consideration, may be determined. 5. That, for certain purposes at least, it would be desirable to acquire the undertakings of the existing companies, if the same could be obtained upon fair and reasonable terms. 6. Your committee have investigated the terms negotiated for such a purpose in the agreements referred to them, which were provisionally concluded between the metropolitan water companies and Mr. E. J. Smith. These agreements are printed in the appendix to this report, and their financial reports are set forth in a Parliamentary paper, also printed in the appendix. The amount of immediate annuities to be paid under the agreements is £773,454; to this would have to be added deferred annuities to accrue by way of increment at various intervals, amounting finally to £325,499, making an ultimate annual payment of £1,098,953. The value of the immediate annuities in 3½ per Cent. Stock, taken at par, would be £22,098,700, and Mr. Smith estimated the present value of the deferred annuities at £6,851,300, making the total value of stock under the agreements £28,950,000. If the deferred annuities had been capitalised at 3½ per cent., the total amount would stand at £29,734,281. In addition to this, it would have been necessary to make provision for the debt charges—viz., preference and debenture capital, amounting to £3,061.500, bearing an actual annual charge for interest of £133,913, and also for the bond and mortgage debt, £223,005, with an annual charge for interest of £7,807. These interest charges Mr. E. J. Smith calculated would, as well as the annuities, be covered by the income of the companies when transferred under the agreements. Adding these charges to the total of the annuities granted as above, the annual payments would have been finally £1,240,673, and the total capital value would have stood at £33,018,836. These agreements were founded on the principle of paying so much in the way of immediate annuities, in consideration of the existing net income of the companies and so much by way of deferred annuities, in regard of the anticipated increase from year to year of their revenue. The present net income of the companies is a figure which is capable of being accurately ascertained and adjusted. It is admitted that the immediate annuities to be granted under the agreements were in excess of the actual net income realised in any year of which we have completed accounts. Mr. E. J. Smith, however, alleged that the annuities he proposed to grant would be met by his estimate of net income for the year ending the 1st of June, 1881. But the question of the future increments is a matter, to a great degree, of estimate and speculation. Their amount must depend on numerous elements at which it is only possible to conjecture, such as the future rate of the growth of houses, and the probable increase in their value, the future rate at which the water rentals are to be fixed, and the future capital which it may be necessary to expend. These are the elements from which the growth of the past has been compounded; whether they will increase or decrease, or remain stationary hereafter, is altogether uncertain. It seems that the calculation of increments on which the agreements proceeded was founded on the assumption that all the items of receipt would grow at a greater rate in the future than in the past; that the number and the value of the houses and the rate of the rentals would perpetually augment; but that, on the other hand, the growth of capital expenditure which has hitherto been required in order to earn an increased income would sink almost to nothing, and might be discarded from the calculation. This does not appear to be a sound basis of a financial estimate for the future. In the investigation before your committee the Corporation of London and the Metropolitan Board of Works have taken part. Those two bodies, on behalf of the water-consumers, whom they may be taken to represent, have declared to your committee their opinion that the terms contained in these agreements do not furnish a satisfactory or admissible basis of purchase; and in that opinion your committee concur. 7. In the resolution communicated to your committee by the Corporation of London, it was stated that the price agreed to be paid under the agreements to the water companies was nearly nine millions in excess of the market value of the property at a period immediately previous to the commencement of the negotiation. As a general rule, the market value of stocks of this description affords the best estimate, not only of the present, but of the prospective value of the commodity. The expectation of future improvement is an element which always enters into the consideration of the market value. It was, indeed, suggested that, in the case of the water companies, their affairs were not sufficiently well known to the public to enable a complete judgment of their value to be formed, and that their future expectations were not sufficiently estimated. But during the past six months, every possible light has been cast upon their affairs, and yet their market value is, at the present time, with a complete knowledge of their condition, still some millions below the price which was payable under these agreements. The value of the shares rose immensely on the disclosure of the terms of the agreements; they fell as soon as it was considered doubtful whether the agreements would be sanctioned; but at no time did they ever rise to the full value which would have been due to them if the agreements had been carried into effect. It is obvious, therefore, that the judgment of the public, as evidenced by the market price, coincides with the opinion of the Corporation of London and the Metropolitan Board—viz., that the price offered in the agreements is greatly beyond the estimated value of the property. 8. Your committee are further directed to 'inquire into the nature and extent of the power of the water companies to levy water-rates and rents, and how far it may be desirable to modify the same.' It is admitted that rates have been raised in recent times under the statutory powers of the companies; and the evidence shows that a considerable portion at least of the increase in the receipts of the companies has been due to this cause, as the increase per cent. in the net water rentals for the last eight years has been, in the case of most of the companies, greatly in excess of the percentage of increase in the number of houses. 9. The companies claim the right still further to increase their rates in proportion to the growth in the value of houses, and this right would have no legal relation to the augmentation in the quantity or improvement in quality of the water supplied. If the companies were limited in the amount of dividend they could earn, as was contemplated by the Waterworks Act, 1847, there might be some reasonable restraint on their power to enhance the charge against the consumer. But the companies assert their right under the title of back dividends to escape from any such limit. Indeed, their right to do so is made one of the grounds for demanding so large a price from the public for the purchase of their undertakings. The calculations on which the agreements were founded proceeded, to a considerable extent, on the assumption that the claim of the companies to back dividends was established. In the evidence of Mr. Smith, the possible amount of such dividends is estimated at nearly 20 millions. The counsel for the companies contended before the committee that the right to such dividends might be carried back to the origin of the company, which accounts for the astounding figures given in the case of the New River Company of £15,000,000 as the amount of back dividend. The counsel for the Corporation and the Metropolitan Board of Works maintained, on the other hand, that no question of back dividend could arise till the Act which introduced a limit came into force. Without pronouncing an opinion on the legal point, your committee must observe that if the contention of the companies is well founded the population of the metropolis and its suburbs, amounting to 4,000,000 of people, would be left at the mercy of certain trading companies, armed with the power of raising the price of one of the first necessities of life to an extent practically without any limit, a situation from which the companies seem to consider there is no escape, except in the purchase of their undertakings at such a price as they may be pleased to accept. If that were the only remedy, the consequences to the consumer of the improvident legislation of the past would be, indeed, intolerable. But Parliament is not unequal to redress such mischiefs to the public interests. The manner in which the gas companies have been dealt with by Parliament may be referred to in illustration of the methods by which a remedy for such a state of things may be effectually provided. 10. Your committee have not had before them any specific scheme for an independent supply of water, and general speculations on the subject are of little value without detailed plans of the sources from which it is to be derived and the cost of carrying it into effect. But your committee would observe that the total cost of the existing water supply to the metropolis has not much exceeded £12,000,000, a considerable portion of which sum may be attributed to works which have become useless or have been re-duplicated. And it would become the duty of the water authority when constituted carefully to consider, with the professional assistance which will be at their disposal, whether a new and better supply could not be obtained at a cost greatly less than the sum which would have had to be paid under the agreements for the existing supply. 11. In the constitution of the water authority your committee would recommend that that body should be intrusted with the largest discretion as to the best method of dealing with the water supply of the metropolis. Various courses might be adopted. It would be possible to proceed by regulation of the powers of the existing companies, as in the case of the gas supply; or by the introduction of an independent water supply; or by the purchase of the existing undertakings. It would be the duty of the water authority maturely to examine which of these schemes, separately or in combination, would be most advantageous to the public. In order to give effect to any of them, further statutory authority would be necessary, so that the judgment of Parliament on any scheme adopted by the water authority would be finally reserved.

August 3."

STATUES, MEMORIALS, &c.

Temple Bar.—On Tuesday the first stone of the memorial structure which is about to be erected by the Corporation of London on the site of old Temple Bar was laid. The structure will be 37ft. high, 5ft wide, and 8ft. long. The base will be of polished Guernsey granite, the next tier of Balmoral granite, and above that there will be pink granite from the same quarry as that used in the Albert Memorial in Hyde-park. In the niches on the north and south side will be life-size figures in marble of the Queen and the Prince of Wales, by Mr. Boehm, A.R.A., and in panels on the sides will be representations in bronze, by Mr. Mabey and Mr. Kelsey, of the Queen's first entrance into the city through Temple Bar in 1837, and of the procession to St. Paul's on the day of the thanksgiving for the Prince's recovery. The superstructure will be of hard white stone, and will be surmounted by a griffin which is being executed by Mr. Birch, A.R.A. The inscription round the structure will be the words:—"Here formerly stood Temple Bar." The memorial is designed by the City Architect, and the execution of it has been entrusted to Messrs. Mowlem, Burt, and Freeman, of Millbank.

The foundation-stone of a new Congregational chapel was laid at Brent, near Plymouth, on Monday week. It is Geometrical Gothic in character, and is 52ft. by 30ft., seating 180 persons, without galleries. The roof will be open, and, like the seats and rostrum, will be of pitch-pine. The walls will be built of local stone, the front being faced with Plymouth limestone. The doorway and side windows will be arched with Leemcor brick, and the hood-moulds and other dressings will be of Bath stone. Mr. H. J. Snell, of Plymouth, is the architect; and Messrs. R. and J. Veale, of Brent, are the contractors. The cost will be about £660.

Trinity Church, New Bridge-street, Newcastle-on-Tyne, has just been reopened, after undergoing important alterations and improvements. Mr. J. J. Lish, Newcastle, was the architect; and Messrs. Copland and Rollo and Mr. James Smart were the contractors for the several departments of the work.

A meeting of the employés of Mr. F. Sage, builder, of Gray's Inn-road, took place on Saturday week at the Tufnell Park Hotel, the occasion being the presentation of an address and purse of gold to Mr. Putterill, who has filled the office of foreman during the past seven years, and is now leaving the firm.

Our Office Table.

Since 1875, some 10,268 miles of railroad have been built in Europe, and about 5,000 miles in other parts of the world outside of the United States, chiefly in Australia and India, so that the world's railways probably stand to-day as follows:

Europe	98,275	miles, or	47	per cent.
United States....	86,121	,,	41	,,
Rest of the world	25,000	,,	12	"
	209,396			

Thus the 50 millions of inhabitants of the United States have furnished themselves with 86,000 miles of railway, while the 306 millions of Europe have 98,000 miles, and the 1,050 millions of the rest of the world possess but 25,000 miles.

It appears, from a paragraph in the Boston *Advertiser* of June 18th, that, after all, something is to be done towards the completion of the work of Signor Brumidi in the Capitol at Washington:—"The joint Committee on Library, before Congress adjourned, instructed the architect of the Capitol, Mr. Clark, to give the New York fresco artist, Filippo Costaggini, a trial at completing the allegorical fresco belt in the Capitol dome left unfinished by Brumidi. No appropriation has been made for continuing the work, but Costaggini was so urgent to exhibit his skill in fresco work that the committee decided to let him show what he could do. He will soon commence work at the point where the late artist stopped. He believes he can carry out Brumidi's ideas and style in the completion of that great undertaking. If he fails, his work will be erased, and another artist will be given a chance to attempt it."

The steamer *Dessoug*, with the Alexandrian obelisk on board, lies at anchor off the foot of Twenty-third-street, New York, waiting for the Park Commissioners to decide where the Egyptian relic shall be placed. Mr. G. L. Feuardent, a New York antiquarian, is of opinion that the best place for the obelisk is in Manhattan-square, at the centre of what will in time be a court before the Museum of Natural History. He suggests that it would be an appropriate thing to adopt the ancient idea, and employ the obelisk as the needle of a sundial, and construct a pavement at its base of asphaltum or some other material on which the figures could be distinctly marked. An asphalte sundial would probably be a useful novelty, and quite as ornamental as the remarkable additions made to our obelisk on the Victoria Embankment by the Metropolitan Board of Works.

The Palais de l'Industrie, at Paris, has been opened with a collection of objects brought together under the auspices of the Central Union of the Fine Arts applied to industrial purposes. This is the sixth exhibition which the society has held, the last having taken place in 1876. The principal objects shown are connected with the design and manufacture of metal, and there is an exhibition—open to all who pay for space—of all kinds of decorative art-work, such as furniture, crystal, textures, mirrors, models of all kinds, &c. In 1882 the special exhibits are to be textures, paper, leather, and furniture. In 1884, wood, applied to construction and decoration, stone, earth, glass, and plants. The exhibitors of metal work are singularly few. The finest are the cases containing bronze statues, statuettes, and busts. There are some curious designs for street-lamps, more ornamental than useful, and a variety of art-work made out of zinc and lead. In another part of the Palais there has been opened a new collection of paintings, tapestry, and ceramic ware relating to decorative art. The circular concerning this exhibition declares that in all the important towns of the world, there are being opened special museums, by which designers are inspired with the *chefs d'œuvre* of art past and present, and concludes with the remark that France must not remain in the rear, but must also have her *Musée des Arts décoratifs* like other countries; and that the directors have to look to private liberality for assistance—to those who desire the glory and prosperity of the country, as well as the cultivation of the arts. In order to attract attention to the object of this appeal, a loan collection of works of decoration has been brought together, and, with the articles already in the permanent possession of the directors, are exposed to public view in the suite of rooms to the south-east of the Palais. The town of Paris has sent several designs in monochrome and colour, the Bibliothèque Nationale has lent four fine pictures by Boucher, and the manufactory of Gobelins sends many designs used in tapestry work; while other works of a high order of merit have been lent by amateurs.

By no means the least interesting feature in the decoration of the new yacht which the Emperor of Russia has built for himself will be the frieze of the grand saloon. It has been executed by Mr. de Morgan, of Cheyne-row, Chelsea, in hand-painted half-tiles, the half-tiles being necessitated on account of the curve on plan of the saloon. Rather vivid colourings have been adopted, as being more in accord with the Russian style of decorations, though, in point of colour, compared with what are generally understood as vivid, these here named are barely secondaries, and are simply vivid when contrasted with Mr. de Morgan's usual tones and accustomed manner. In all the decorative and furnishing work of the Emperor's yacht, time has been a point of primary consideration, rendering much care of detail and unity of finish out of the question. Mr. de Morgan's work has —as far as it goes—suffered but little on this account of time; indeed, the only difference is that we have a bold, rather than an intricately minute, design and arrangement of parts. The frieze is divided at about sight-line level into panels between the windows by marble framework, and, although the pattern is repeated throughout, the variety of colourings and tone, produced by the running of the pigments in the kiln, an absence of anything like machine-like monotony is strictly avoided. Peacocks and other richly-plumed birds, with reptiles, and very conventional foliage and trees, are the subjects mainly treated in these friezes. Mr. Wm. Leiper, of Glasgow, we believe, is the architect supervising the decorations and finishing of this very important vessel, and the contracts for the work are chiefly taken by three London firms, viz., Messrs. Jackson and Graham, by Messrs. Gillow and Co., and by Messrs. Christie, which latter firm, we hear, are executing the saloon chairs, at about £40 per chair, a quotation which, alone, will give some idea of the extensive and likewise costly character of the work in question.

Mr. James S. Randell (of the well-known firm of Randell, Saunders, and Co., Limited) has an interesting and very important article in the *Fortnightly Review* for the present month on "Friendly Societies: their Position and Prospects." Some of his facts, revealing the terribly unsound condition of some of the provident societies which at present afford the industrial classes the only means of providing against sickness or old age, really call for serious attention at the hands of the Legislature. The *Echo*, in a review of the article which appeared on Friday last, hints pretty plainly that if Insurance Companies and Banks had been conducted on principles similar to those of most of the Industrial Friendly Societies, we should, long before this, have had to learn to do without them. Mr. Randell suggests the desirability of establishing a National Benefit Society, with a national guarantee, similar to that of the Post Office Savings Bank, to which a minimum contribution, securing a minimum benefit should be made compulsory on the part of every young working man from the age of eighteen to twenty-one, and to which men of riper years should be allowed to contribute further at their own option.

The twenty-third annual report of the trustees of the National Portrait Gallery has been presented to Parliament. The donations, which amounted to 238 in the last report, have now been continued to 251. The additions include "The Convention of the Anti-Slavery Society," under the presidency of Thomas Clarkson, painted by B. R. Haydon, and presented by the Committee of the British and Foreign Anti-Slavery Society; a portrait of the water-colour painter, A. V. Copley Fielding, by Sir W. Boxall; another of Inigo Jones, copied by Old Stone from a picture by Van Dyck; another of Maclise, by E. M. Ward; a bust of Robert Owen, &c. The purchases, which were 345 in the last report, are now 358. Among the new ones are a portrait of Queen Mary II., by Gaspar Netscher; of Prince Rupert by Lely; and of Miltou, at the age of 62, when blind, engraved by William Faithorne; and a bust of Benjamin West, life-size, by Chantrey. A number of autograph letters have also been added, several of them from the correspondence of the late Sir Anthony Panizzi. There have been 892,462 visitors in all to the collection from the time when it was first opened in Great George-street, Westminster, in 1859, to the end of 1879. The largest number of visitors in any one year was in 1876, when the Prince of Wales's Indian presents were on view. In that year the number was 108,252; in 1877, 79,987; in 1878, 72,105; and in 1879 (when the exhibition was closed for alterations in the spring months), 64,304. In the first six months of this year the visitors have amounted to 40,510.

At the next examination of the City and Guilds of London Institute for the advancement of sectional education, the examination in blowpipe analysis will be discontinued. The following subjects will be added to the programme:—Plumber's work, zinc and tinplate work and tools. Steel and iron manufacture will form one subject. The examinations will be held on two evenings instead of one, 'in order to give candidates an opportunity of being examined in the subjects of two allied industries. The Institute will accept as evidence of the candidate's knowledge of the necessary science subjects a certificate stating that the candidate has obtained a degree in science at one of the Universities of the United Kingdom, the City and Guilds of London Institute, the Royal School of Mines, University College, London; King's College, London; the Yorkshire College of Science, Leeds; University College, Bristol, and Mason's College, Birmingham; stating that the candidate has attended a course of instruction under a professor or professors at one of the above institutions in the science subjects allied to the technological subject in which the full certificate is claimed, and has passed an examination in such science subjects satisfactory to the professor.

The thirty-fourth half-yearly meeting of the Improved Industrial Dwellings Company (Limited) was held at the Mansion House, on Monday, Sir Sydney Waterlow, Bart., M.P., chairman of the Company, presiding. The report showed that the total revenue for the past year amounted to £31,353 2s. 8d., and the total expenditure to £17,534 14s. 7d., leaving a divisible profit of £13,818 8s. 1d., which added to previous balance of £344 18s. 7d. made £14,163 6s. 8d. available for dividend. The directors recommended the payment of the usual dividend at the rate of 5 per cent. per annum, free of income-tax, which would would absorb £10,625, that £3,500 be added to the reserve fund for the equalisation of dividend, which would then amount to £10,000, and the carrying forward of the remaining sum of £38 6s. 8d. to the next account. In moving the adoption of the report the chairman regretted the smallness in the number of shareholders present, and thought the shareholders should take a great deal more interest in the companies of which they were practically partners than they usually did.

It would be just as well next week, when the Premier has left town, to look to the condition of the drainage of the houses in Downing-street. Our contemporary, the *Lancet*, we notice, states that, for a day or two, some of the symptoms of Mr. Gladstone's illness "gave a typhoid aspect to the facts." Repeated complaints have been made, from time to time, of illness among the clerks working in some of the adjacent offices, which it was alleged was due to the defective construction or maintenance of the drains. Our public men sacrifice quite enough of the dictates of health at the shrine of patriotism or ambition, whichever it may be, without being compelled to incur the risk of catching typhoid-fever when they move into the official residences provided for them.

The late Mr. E. J. Smith was one of the two fortunate land agents and surveyors in England who do the business of the Ecclesiastical Commissioners and of the Church Estate Commissioners for England and Wales. It is probably well known that these Commissioners are as a corporation wealthier than any landowner in the kingdom, and their vast possessions include some of the finest lands in the country and real and mineral property of all kinds. The practice of the Commission has been to divide England and Wales into two parts, a northern and a southern division, and to carry on their business upon that basis. For the Southern division Mr. John Clutton is the receiver, and for the northern division the late Mr. E. J. Smith—whose name and whose sudden death are well known to the public in connection with the Select Committee on London Water Supply—was the receiver. The method of remuneration has (the London Correspondent of the *Manchester Guardian* believes) been by commission on receipts, and the receivers have in this way had very large emoluments. The question of filling up the vacancy caused by Mr. Smith's death was probably discussed at the last meeting of the Commissioners, which generally takes place on a Thursday, and it is not improbable that the matter—one of no small importance to public interests—will be shortly mentioned in Parliament.

A writer in the *Sportsman* of Saturday, signing himself "Lorgnette," recommends people wanting a unique sight to explore the back streets of Canterbury. "I did so last year," he explains, "and found an interesting and ruined church, which stood near an asylum or hospital, I forget which. What made the sight more interesting was the fact that the whole of the nave had been turned into a pigstye, in which unnumbered black swine were placidly feeding. The contrast between this grand old ruin—one of the oldest, if not the oldest, churches in Kent —and the unclean animals it housed, for it was fitted up as a pigstye, made a man think with peculiar satisfaction of the reverent manner in which the Church of England treats some of its historical edifices. To find a church made into a barn in some remote country village is a little uncommon, but the place may be far away from the haunts of men, and hardly known even in a gazetteer. In Canterbury itself, however, to see a well-known city, and a city, too, which gives the Primate his proudest title, turning a literal church into a literal pigstye, struck me as being the most sublime piece of irreverent and dirty vandalism which could be named." We trust "The Looker On" has made a mistake.

In a report to the town council of Bath, Mr. C. E. Davis, the city architect, has given some interesting particulars of the Roman baths he has discovered to the north of the abbey during some drainage excavations. In addition to the baths made known a century since, Mr. Davis has found a large bath, about 80ft. by 40ft. in width, lined with lead ¾in. in thickness, and surrounded by a flight of massive steps. The margin of the bath is formed by a platform, 17ft. wide, and paved with 8in. stones, and the whole appears to have been inclosed in a hall, estimated to have had dimensions of about 174ft. by 120ft. The drains and sluices for regulating the influx and efflux of water were very complete. The report was adopted, and it was, after a discussion of a party character, resolved to place £700 at the disposal of the committee for further drainage works at this point, so as to underpin neighbouring premises, to open out the baths, and to utilise and purify them.

CHIPS.

On Tuesday week Mr. W. S. Gore Langtou, M.P., entertained at dinner the workmen who have been employed in the construction of new stables for him at Dunster. The stables are for a hunting stud, are situate near Kuttrell Arms Hotel, and are constructed in the Gothic style, with every modern improvement. The architect was Mr. C. H. Samsou, and the contractor, Mr. H. Davis, of Taunton.

The Sanitary Institute of Great Britain have awarded Messrs. Woollams and Co. a medal, "as a special mark of merit" for their paperhangings, "free from arsenic," exhibited at the late Croydon Exhibition.

The corporation of Saffron Walden are making extensive alterations and additions to the gasworks lately acquired by them. The additions comprise new gasholder (to hold 35,000ft.), new purifiers, storehouse, &c., Mr. Jabez Church, of Westminster, being the engineer; Messrs. Whiffin and Sons, of Saffron Walden, the contractors for excavations and brickwork; and Messrs. Cutler and Sons, of Millwall, London, for the ironwork.

New schools erected for the Norwich School Board, in Crook's-place in the city, were opened on Monday. They accommodate 900 children in three equal departments, and have been built at a cost of £7,000, exclusive of site, by Mr. R. Wegg, from the plans and under the direction of Mr. Brown, of Norwich, architect to the Board.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 20, 1880.

WHAT IS A BRICK ?

THE question seems easily answered; but we doubt whether one in a hundred would give a satisfactory reply, and describe with any degree of accuracy the salient points of a good brick. Its size is as changeable as its character, and builders in each particular locality accept the dimensions which custom or caprice have dictated. Colour is due to the chemical quality of the clay or marl from which the brick is made, and its yellow, red, or blue shade proceeds from the presence of various metallic oxides which are acted upon by the heat of the kiln, while undergoing the process of baking or firing. Clays of the finest quality, not even excepting kaolin, are formed of minute particles or atoms, spherical in shape, which are rendered plastic, or become hydrated, from the influence of water, for which they display a retentive capacity. There are what may be called two important divisions of clays, the "rich" and the "poor," or the "fat" and the "lean," divided, in a somewhat arbitrary manner, into all sorts of subordinate, and ofttimes senseless, classifications. The application of chemical rules under existing circumstances is generally disregarded, and ordinary brickmaking, throughout this country, may be described as a wasteful industry, in which much waste of labour and material takes place.

In the London districts we have, in all directions, abundant examples of brickmaking of a character neither creditable to our constructive capacity, nor in keeping with our scientific pretensions. If we take the Metropolis as a centre, and describe around it a circle of fifty miles radius, we shall include within its circumference a great variety of clays, from which are produced the bricks supplying the requirements of London and its wide-spreading suburbs. The ordinary and commonplace stocks, made on the ground on which the buildings are to be erected, may be regarded as the very lowest type of brick-industry within the influence of our prescribed limits of observation. We shall, however, make some remarks on this well-known brick, and describe the methods in vogue by which they are fabricated.

The loamy clay from which stocks are made requires a good deal of preparation before it is fitted to be moulded into the desired shapes. The clay is first dug in the late autumn, and laid up into convenient heaps, which, after more or less weathering, is mixed with certain proportions of chalk and fine coaldust or ashes. The object of applying the finely-comminuted chalk is for the purpose of fluxing the obdurate sandy clay, and the ashes to assist in the ultimate calcination of the brick. The usual means adopted in this primitive process may be considered competent to produce such a brick as will pass muster for the commonest buildings, the hardest of which being used for external walls, and the softest and unshapely or imperfectly-burnt are hid away in division and internal walls. The operations which aim at a mixture of the clay, chalk, and ashes fall far short of what might be accomplished by a more sensible treatment of these easily-combined materials. Simple digging, and a subsequent turning over of the clay-heap, together with the final mixing through the pug-mill, is not calculated, even when done in the most successful and careful manner, to produce a homogeneous mass. In the absence, therefore, of a perfect mechanical combination of the materials, the subsequent heat action cannot be accomplished with any degree of accuracy or success. The result is irregularly-burnt bricks, of various shapes and forms, and all more or less defective in texture, rendering them incompetent to resist the most ordinary conditions of wear and tear to which they may be submitted. How much better the results of all the labour now employed might be, if a more perfect and reasonable amalgamation of the raw materials were brought about. The clay, as now treated, is only imperfectly acted upon by the chalk, and the consequence of such slovenly treatment is apparent in the produce realised in the clamp. Without the introduction of the chalk, clays of the character we have referred to could not be fluxed by the small amount of fuel now used in the stock brickmaking industry. The production of stock bricks is a very large one, and the outlying districts of Uxbridge and Sittingbourne, with a host of less-important contributories, supply the wants of London, which, in prosperous times, amounts to several hundred millions a year. The colour of a good stock brick is a pale yellow, and when the clay is favourable in quality, and the manipulation tolerably good, a brightness in shade is produced, very pleasing to the eye. The careless or indifferent stock brickmaker, in his haste to produce a cheap article, disregards the character of the clay, and takes no pains or trouble to eliminate the flints and stones during the process of conversion. Hence, unsightly and unshapely bricks always secure a market, because our controlling building authorities exercise neither vigilance nor do they submit such building materials to any standard or test which could challenge their imperfections.

Red bricks are produced from a variety of yellow clays of more or less obduracy, and those made by hand, from whatever quality, have to be reduced to a consistency soft and ductile enough to permit of its easy conversion by the moulder. This necessity, in the case of hand-made bricks, leads to much waste, and the introduction of the sand, owing to its imperfect amalgamation with the clay, coupled with its careless and improvident use by the moulder, produces cracks and flaws, preventing the desired beneficial cementing action in the kiln. In all hand-treated clays, whether of the desired texture or not, sand has to be used in the process of moulding, although sometimes, in some localities, wet or slop moulding is still practised. Hand-made bricks, from a good yellow clay, when well burnt, producing a bright red brick, are generally preferred to those made by machine, which, owing to the pressure they are necessarily submitted to, have imperfect arrises, as well as being uneven in bed or angles.

If we carefully examine the fine red bricks made, say, during the Queen Anne period, we shall find that not only has the clay been made perfectly homogeneous, but combined with very careful hand-moulding, has resulted in the production of an article of great excellence. The durability of these bricks of the period we refer to is now proved beyond question, for they have stood the wear of nearly two centuries in a London atmosphere. There is much improvement in the make of red facing bricks in recent years, owing to the successful introduction of first-class terra-cotta ornament, with which a good effective combination is produced, much to the credit of the architect and the adornment of London. The search after clays for such purposes, and the chemical rules with which it was controlled and guided, resulted, as might have been expected, in a better appreciation of their qualities, and a more sensible method of treatment. Some defacement of the first-class red bricks is, however, perhaps unconsciously, committed by the modern architect, who designs Oolitic stone facings, from which, in a comparatively short time, the carbonate of lime is washed out, producing stalactitic drippings, which permanently disfigure the brick, and thus prejudicially blemish the even colour of the walls. A good, or rather a bad, example of this natural and uncontrollable degradation of the stone and consequent discolouration of the red brick, is already apparent in some portions of the New Law Courts buildings.

There are a great variety of clays from which good sound facing bricks can be produced, and almost every district has its own peculiar method of treatment.

It is desirable, in manufacturing bricks of first-class character, to adopt suitable machines, not only to secure a good and true form, but also to increase their density, which mechanical pressure accomplishes more readily than the ordinary spasmodic thrust of the moulder's arms and hands. Machine-made bricks are from this cause much heavier than those made by hand; because the pressure which they are subjected to dispenses with a large proportion of water of plasticity, without which the moulder could not, while producing a good or perfect form, secure the required density. The surface clays from which the red bricks are produced have generally a considerable proportion of nodules of flints or other foreign materials, such as carbonate of lime. When machinery is used, and these objectionable impurities pass unchallenged, they, when submitted to the heat of the kiln, become changed in character, and result in the blemishes so frequently seen in bricks of this class. The carbonate of lime is converted into lime, and the flints rendered friable, so that on exposure to the atmosphere the one becomes hydrated and the other pulverulent, while one or either, by their unavoidable expansion, degrade the brick and render them in many cases useless.

In the gault-clay formations of Hitchin and the Medway, we find an abundance of the most valuable materials for the production of first-class white and light-coloured bricks. The favourable condition and character of this well-known clay, not only from its excellent mechanical combination, but also from its suitable chemical proportions, render it, under moderately careful treatment, capable of making perhaps the best bricks which can be produced in this or any other country. This clay in some of its beds of deposits is highly indurated in character, and requires considerable preparation before it can be accurately moulded either by hand or machine. It is not, however, necessary to add any chalk in preparing it for moulding, as it contains naturally about twenty-five cent. of carbonate of lime in a very finely comminuted state. Notwithstanding such well-conditioned circumstances, however, this clay, in even its finest form, should be submitted to a pulverising, or, according to its texture, water-saturating treatment, so as to derive the fullest value from the action of the kiln. There are, we might say, unfortunately, a demand for various qualities of bricks, whether made from gault or other less valuable clays, and brickmakers cannot resist the demand made upon them for those of an inferior and cheap quality. The margin of price between the best and the worst of any kind of brick is not wide enough to warrant the architect or engineer, to accept such goods, or encourage by their tacit patronage their indiscriminate use. A careful examination of the best gault bricks from Hertfordshire or Kent will show that in point of texture (which includes porosity and hardness) no better aid to the constructor, whether in a substantial or decorative form, could be desired.

From these few observations it will be apparent that there are what may be termed suitable and unsuitable clays, just as there are in the mortar direction carbonate of lime of divers qualities. Clays, however unsuitable, are sometimes converted into bricks under the impression that the materials being in the ground where the buildings are to be erected, they must be used, and the modern absurdity of basements to buildings, provides, in clayey districts especially, the first instalment of the excavations for such a purpose. The intelligent observer cannot but see that such an arrangement is at best but a short-sighted one, for under what we may term such compulsion, the quality and character of buildings so erected are bad, and in the end unprofitable, and under other and more sensible conditions of controlment would be impossible.

Under such a variety of systems or processes of brick production from all sorts and conditions of clay and loam, it is not surprising to find that the results from such conflicting causes are most undesirable in character. The common stock brick, made regardless of accuracy of form, or, indeed, of any fixed rules as to its size or capacity of resistance to any kind of strain or test, differs widely from the finely-moulded and equally carefully-burned brick from the "gault." Sizes or true form in the "stock" bricks are utterly disregarded, because in the majority of cases these distorted and ill-conditioned forms are intended to be artistically veneered with a "compo" plaster of dubious character, for those builders who would use the bad brick are not likely to be very particular about the character of the material which, for a time at least, hides its nakedness and deformity. In the northern suburbs of London some very excellent gault bricks have been used, and the uniformity of colour, as well as their substantial character, creates a wish in the mind of the observer that their use was more general. The use of perforated gault bricks meets a difficulty in reference to the bond of the work, which would be better secured than at present, if, instead of doubtful lime-mortar, a weak mixture of Portland cement and clean sharp sand was used in some grouting form.

Under the circumstances we have described, it is quite impossible that any uniformity of weight, size, colour, or strength can prevail, and the confusion consequent thereon is in some degree heightened by the knowledge that no ready means of test can be commanded. If we were to suggest a handy remedy for guidance to one and all, it would be that no brick for any purpose whatever should be considered *good* unless it can stand the brunt of being tipped out of the cart or waggon in which it is carried from the point of manufacture to its destined resting-place. How few bricks, in our London district at all events, would be competent to stand this not by any means unreasonable test, for, instead of being coherent enough to stand tipping, they can scarcely keep together under the jolting of the cart. Look at the labourers unloading a brick-cart at say a "jerry" job in a London suburb. How daintily he handles the fragile forms, and carefully deposits them in a stack where they, in their condition of mutual support to each other, appear to be good and true. The next stage of handling is into the hod, and the chuck-down on the scaffold from which they are speedily passed by the bricklayer into the walls, where their rottenness speedily becomes enshrouded in the dabs of mortar, fitting companions which, by subsequent equally improper and uncontrolled treatment, assume a goodly shape, hiding under the guise of ornament all their faults and shortcomings.

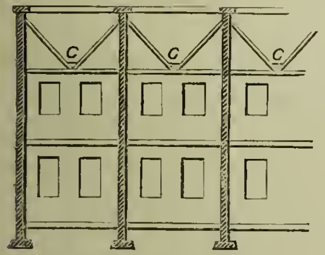
Tipping building bricks out of the cart is a common, indeed almost a universal, practice in some of the midland and northern counties, but more especially in Yorkshire, Derbyshire, and Nottingham, where many first-class bricks are made from the indurated clays or shales of the coal measures. It is a refreshing sight for one accustomed to the rubbishy bricks used in London, to see the carts tip up their loads of bricks in Manchester, Leeds, or Nottingham, and to hear the true, almost metallic, sound with which it is accompanied; proving that not only is the clay good and suitable from which they are produced, but that the manipulation which controlled their fabrication was sensible in character.

All clays may produce bricks of a good kind; but the intelligence which directs their conversion into bricks must be of a different kind from that now generally prevailing. Sandy or harsh loamy clays can only be used by the addition of carbonate of lime: to induce the fluxing of their obdurate parts is absolutely indispensable to produce a hard or sound brick. The proportions determined on should be true, and not dictated by any rule-of-thumb process, but controlled and guided by the necessary chemical knowledge. In like manner, strong or fat clays which require reduction should have the amount of sand or loam carefully apportioned. Under such circumstances the best benefits would be derived from the fire or burning process, which again should receive some more rational guidance than it does at present. Were such means adopted in a sensible preparation of the clays, and an equally attentive regard to the heat action in the kilns, we should soon arrive at a knowledge of "what is a brick?" Until then it is only prudent for us to suggest that a good sound, and in every sense competent, brick should be thoroughly homogeneous in texture, and even in whatever may be the required colour, having a capacity of withstanding a certain defined tensile, transverse, or compressive strain. Much ingenuity is now wasted in a classification of bricks, and we are indeed surprised to find that this bewildering system is countenanced by architects who should steadfastly oppose such a practice. If a good brick was insisted upon (in other directions, such as cement, for instance, it is pressed) good qualities would soon be forthcoming, for the varieties now so unhappily prevailing are due to the slovenly system of brickmaking, through and by which arrangement into classes is unavoidable. It meets also a dangerous and irrational tendency to cheapness which, we are sorry to say, influences many in the selection of that which, failing their support or countenance, would be regarded without any great stretch of the imagination as simply rubbish.

THE DIFFICULTIES OF THE ARCHITECTS OF LONDON.

ENGLISH architecture and architects are made the theme of spirited and well-intentioned sketches or letters in the columns of our French contemporary, *La Semaine des Constructeurs*. The writer of these letters, Mr. Lawrence Harvey, a London architect, and formerly student at the School of Beaux Arts at Paris, recounts the difficulties met with by the architects in London more particularly, and it may be of some profit and interest to the English reader to listen to what he has to say touching our architecture and practice. Mr. Harvey begins by giving his brethren across the Channel a list of the enemies the English architects have to encounter. The first paragraph, headed "Enemy No. 1," describes with a great deal of force and justice the landlord's surveyor. He shows that nearly the whole surface of London belongs to great landlords, either individuals or corporations, who never sell their land, but grant only leases of various terms between 21 and 99 years, and that nearly all private buildings are erected under conditions imposed by great proprietors. Exaggerated economy, says the writer, is the consequence; the individual who builds is not content with 4½ per cent. interest on his capital, but wants 7½ per cent. on account of his money being placed in buildings—lost funds (*à fonds perdu*). The result of this is clearly explained. The English capitalist can only spend in construction £100, where the Parisian would willingly spend £160; and of course, as we are told, the difference accounts for the light constructions which distinguishes England from the Continent. "Our walls so thin," says our reviewer, "our floors bend at every footstep, and our façades are a thin facing of stone 10 centimetres thick—that is quite enough to kill the architecture." This is not all; the condition has given rise to the surveyors, whom, the writer pointedly remarks, are our great enemies—"Cet état de choses a donné naissance aux surveyors, nos grands ennemis!" The surveyor is the agent of the proprietor, employed by him to watch his interests. "To him," says the review, "you have to address yourself for renting the ground on which you will build; he has to control and approve your plans prior to their execution, because one of the stipulations of all leases is that the buildings shall be erected to the satisfaction of the surveyor of the landlord. By this, you see the enormous power which these individuals possess, power of which they naturally make use to round their already fat pockets (*la forme déjà dodue de leurs poches*). They call themselves architects, just as others call themselves Spaniards without having any right to do so," and the writer hints that their power often allows them to practise usury. We again translate a passage to show in what aspect the English surveyor is regarded by this French critic. "I would not complain were they only mediocre; but unfortunately, the school one has to pass to acquire a position as surveyor is not one of artists, but administrators; their business is chiefly contentious; their school is the office of the surveyor to whom they will perhaps succeed later on; their artistic ability matters little, as business comes to them by force of circumstances." Again he says (and we may weaken its force by rendering it in English), "Vous le voyez, en architecture, l'Angleterre ne pratique pas le libre-échange, mais la protection de l'incapacité. Ne vous étonnez donc que d'une chose—c'est que notre art ne soit pas ici dans un pire état." As an instance of the price of London leases, a house in Bond-street is cited with a frontage of about 20ft., and a depth of about 95ft., where the lease for the ground only is £1,000 sterling, or 25,000fr. per year. Yet the capitalist, although he has expended a good deal, cannot let—a fact very encouraging for architecture! We confess there is a great deal of truth in the remarks on the landlord's surveyor; but there is another kind of surveyor, the district surveyor (or *agent-voyer*), called Enemy No. 2, to whom is attributed much of the faults of our architecture, and many of our metropolitan architects will echo the writer's observations. The district surveyor is less terrible, we are told; his principal fault is that he is allowed to do private work, though a public functionary; but in cutting his nails, one could make a presentable being of him (*presque sociable*). "By his supervision he arrives at a power of the thickness of a wall, he gets an artistic connection, and thanks to the idea with which the citizen is imbued, the district surveyor can favour him with some indulgence if he is employed as the architect." The origin of the

Building Act, it is satirically pointed out, has influenced prejudicially the good construction and appearance of our buildings. The fear of another great fire has deeply impressed the surveyor's ideas. "One can scarcely see any other thing in it," says the critic, and he proceeds to point out what are admittedly the blemishes of our street buildings. One of these is the rule for the construction of roofs, which requires that the gutter shall always be separated from the street by a parapet not less than 9in. thick and 1ft. 6in. high, the result of which is that at any time the gutter becomes stopped up, the house is flooded. He says, "At any snowstorm in London you will see the picturesque spectacle of Englishmen walking on the roofs of their houses to clear off the snow, without which the thaw would be fatal." This law for the gutter, it is added, has given rise to a kind of roofs not found elsewhere, an infinite series of houses with gutters crossing from the front to back in the middle of the houses, the party walls being carried to the apices of the gables. This manner of roofing by two sheds (*formée de deux appentis*) is common. (See sketch.) Diagrams are given to illustrate the effect of this ruinous and unsightly construction, and the French reader is justly told that this strange mode of construction satisfies the law entirely, both with respect to the gutters and also to the party-walls, which have to be raised 1½ft. above the roof. The builder saves, by these arrangements, one length of gutter and two lengths of parapet, besides other things. Many other peculiarities in our Building Act are pointed out. Another enemy is the vestry surveyor; but he is less exacting, and he is only mentioned as taking a fee for signing plans. He is not allowed to take private business. The lawyers (*les hommes de lois*) are Enemy No. 4. These, as an obstacle to business, surpass all. Laws are dispensed with all vague necessaries, giving rise to innumerable pleadings, and the writer remarks with truth, realised by those who have had experience, that the cost of a process is so enormous that "one cannot have an idea of it in France," while he mentions that the legal costs of proceedings to enable the Metropolitan Railway to be constructed equalled the cost of the work. No one will say that Mr. Harvey in these sketches, has drawn on the imagination. The enemies or difficulties sketched are no ideal creatures, as every London architect is aware, but it would hardly be right to assume that the French architect is entirely free of them.



C. C. C. GUTTERS

The concluding part of the article, of which we have here given the gist, contains a valuable practical hint addressed to our confrères in France. The writer says, several of my colleagues have consulted me repeatedly for plans (sketches) drawn by French architects, which they are about to carry out here, and he mentions the one source of great embarrassment is the reduction of the measurements, which imposes the obligation of making new drawings for execution in England. "This unnecessary work, even dangerous from an art point of view (as the interpreter puts a little of his own) can readily be avoided by adopting a metrical scale (*échelle métrique*) corresponding with the measurements used here." The English foot and its subdivision into eighths is described, and the author explains that for a general sketch, the English custom is to adopt an eighth of an inch scale for the foot which corresponds with 1-96 of the real size. The reduced English measurement would be represented by its 1-96th part, and could be obtained by dividing in 24 equal parts 0·25m. Mr. Harvey's letters are written in a half-humorous vein, though they point in quiet satire to some of the undoubted difficulties with which the artistic architect is beset in England. They are, perhaps, a trifle exaggerated in tone, and the English architect will be disposed to reply that these enemies affect only a small part of our metropolitan architecture, and that in the provinces they do not exist. He may also retort that the French architecture is influenced as much by an academic régime. which destroys all originality and vitality. Be this as it may, we are bound to say the remarks of Mr. Harvey will have the effect of placing whatever merits or demerits exist in our art in a clearer light in the eyes of our French colleagues, and we may join with him in the expression of the hope that they will feel some sympathy for our work, and entertain in the future more charitable sentiments towards their English brethren.

* * *

A RECENT VISIT TO RUSSIA.

NOT the least interesting buildings within the great walls are the churches of the Kremlin, which, as a group, occupy the centre of the inclosure; connected with these is the

HOUSE OF THE HOLY SYNOD,

formerly the sacristy of the Patriarchs of Moscow. From these churches, prior to being shorn of some portion of their power by the cathedrals of St. Petersburg, being the metropolitan churches of the Empire, the House of the Holy Synod is a building of considerable interest. Here the greatest and most sacred offices of the church are performed, and here are stored the richest treasures of literature and art associated with the national faith. As a building it may be classed as part of the State or Imperial buildings, literally a portion of the old palace, in which position it illustrates the close and intimate connection that exists between Church and State in Russia.

Amongst the objects of art stored in this synodal house are seven gold mitres of the high-priests, studded with gems and stones of great value; the oldest, which is 5½lb. weight, dates from the time of our Queen Elizabeth. Allied to these are the sacerdotal robes, or sacred garments, of the patriarchs—a race of dignitaries that existed down to the time of Peter the Great; but which, from their enormous powers, were suppressed by that monarch, and replaced by the Holy Synod, the president of which is the metropolitan of the State or National Church. The most remarkable vestment, some of which date from the 14th century, is a gold-embroidered cloak, of fabulous value, the weight of which, augmented by pearls, plates of chased gold, diamonds, rubies, emeralds, and garnets, is 54lb. This was a gift of Ivan the Terrible to the offended Church, and was accepted as an offering at the shrine for foul deeds done in his flesh—crimes which culminated in the murder of his only son, and in that of one of the patriarchs of the Church. This vestment, as a work of art, is contemporary with our King Henry VIII.

Of other trappings of these high-priests we may notice some pendant gems worn on the breast, and attached to collars of gold. These are of rare beauty, workmanship, and size, the largest measuring 3½in. by 2½in.

Of the vessels of the church, the most noticeable are those connected with the chrism or holy oil. This fluid, believed to be part of the oil used by Mary Magdalene in anointing the feet of Christ, was brought from Constantinople, upon the introduction of Christianity in 981, in a long-necked copper vase, overlaid with plates of mother-of-pearl. This vessel, although believed by many to be of later date, is still preserved with its miraculous contents. The chrism or holy oil of the Russian Church is periodically distributed amongst the bishops from sixteen silver jars, after being made with great solemnity from thirty ingredients, such as oils, wines, gums, and spices, in large cauldrons and kettles of silver. The highest office in the making of this holy oil is that of taking one drop of the superlative compound from the above vase—a drop or extraction that is replaced by a like quantity of the new compound. It is worthy of note that the silver vessels, the gifts of kings, employed in this holy office, are, in the aggregate, about two-thirds of a ton in weight. This holy oil, we need scarcely say, is used in anointing the Russian Emperors, and in baptising every Russian of true or orthodox faith.

The library of this building contains, among its treasures, some Greek manuscripts of the eight centuries, and Sclavonic manuscripts of the eleventh centuries, the latter being followed by a version of the gospel of the twelfth century.

The first of the churches clustering round this synodal house is the Cathedral of the Assumption, formerly called the "Patriarchal Cathedral," but now commonly known as the "Coronation Church." The position occupied by this church in Russia is parallel to that of the cathedral of Canterbury in our own country. In matter of size it is a mere chapel—a remark that applies to all Russian churches, when compared with those of Western Europe. Its foundation dates from 1326; but the present fabric, although it has undergone restorations consequent upon the damage it received at the hands of the Poles in 1612, and from the Great Fire of 1737, is the work of Aristotle Fionaventi, of Bologne, who erected it about 1480, after the model of the cathedral of the old metropolis of Vladimir. This cathedral of Vladimir dates from 1154 to 1160, and was the coronation church of Moscow down to 1432. In this coronation church of the Kremlin we have a church of the true old national type, and the contemplation of it carries the mind by easy gradients from Moscow to Vladimir, and from thence, via Constantinople, to the Holy Land. In plan the church proper is a square apartment, the entrance to which is through a western porch, given up, as is invariably the case, to the ever-present mendicant. The walls, of great height and strength, are pierced with lancet-like windows, and entirely covered internally with sheets of iron or copper, as a groundwork for rude paintings. Those on the south side are pictures of the seven councils, those on the west are illustrations of the Last Judgment, and those on the north are incidents from the life of the Virgin Mary. The east, an internal wall, is the great screen, decorated in like manner with five tiers of paintings; the uppermost depicts the Eternal Father supported by the Patriarchs; the next, the Virgin and Child, in the company of the Prophets; in downward course follows scenes from the life of Our Saviour, below which is the Saviour, supported by angels and Apostles. On the lower, or hung on the line, are the sacred pictures, of which we shall give a passing note. These pictures, as a whole, are painted on a ground of gold, in a mixed order of merit, and coming, as they do, from an Eastern source, they suggest the channels from which the Italian

Mosaics—so ably illustrated on the walls of the South Kensington Museum—have been drawn. In the centre of this apartment, which is the equivalent of the nave, aisles, and transepts of our western churches, are four columns, which support the central dome, a feature the height of which is 125ft. These columns are, in like manner, the groundwork for metal pictures. The general effect of all this display of art is disappointing. You can, at best, but imagine yourself in an apartment in which poverty of material and architecture is painfully apparent, and in which the walls are covered with old frameless pictures, the value of which, as works of art, it would not be difficult to estimate. Below the sight line of these pictures, the walls on the north, south, and west are occupied with tombs of metropolitans, most of which are saints of the National church. The places of highest honours are the four corners, two of which are occupied by silver tombs or shrines, guarded by attendant priests, whose offices are to receive the army of the faithful. The wall, in like manner on the east, is occupied by the steps and platform of the choir, which extends across the whole of the building. Through this screen are five doors or openings, leading into as many chapels, the central one being the "Bema," or sanctuary. These eastern chapels occupy the same position with regard to the nave or body of the church, as the fingers do to the palm of the hand. Over these chapels are other apartments, and out on the roof, symbolical of a high place, and the top or summit of the church, is an apartment or sacristry, in which the prelates of the church are elected. This eastern portion of the church is a more lofty construction than the nave, and being crowned with a minaret, capped with a bulb-shaped golden dome, is palatial in its grouping. The nave, with its range of semicircular roofs, counterparts of the "Brompton boilers," its large dome, and its four attendant smaller ones, is but a minor feature. This church, the true heart of Russia, groups with the great Ivan bell-tower, and is the central feature in all the views or drawings of the Kremlin of Moscow.

Such, roughly speaking, are the outlines of this important building. In its material of construction it has nothing worthy of notice; the walls are of brick or rubble masonry, roughly cast, the outer face is finished white or light buff, and the whole of the domes are copper-gilt, a finish they received about two hundred years since.

The details of this building are too interesting to be lightly passed, and we must ask our readers to imagine themselves seated under the central dome whilst the most important are passed in rapid review. The act of being seated must end in imagination, for no such aids to rest exist in this holy place, the Emperor himself being required to stand when attending Divine service. The most notable feature before us is a picture on the altar-screen or "Iconastas," to which groups of people make their way, with the object of kissing it in devotion. This is a picture of the Holy or Blessed Virgin on a composition of wax supposed to have been painted by St. Luke. It was carried from Khersonesus, an ancient and now ruined city in the Crimea, to Kief, in 988, by the Grand Duke Vladimir, from whence it reached Moscow in 1155. In 1395 it was credited with the miracle of driving the Tartars from the country, and in 1812 it was one of the first treasures of the city to be borne away for safety. It is one of those pictures, the figures of which are Asiatic in features and Ethiopian in complexion, and in which the robes and groundwork are overlaid with beaten gold. The jewels set in the crowns are valued at £45,000, one emerald alone being worth £10,000.

The next most valuable shrine, or picture, is that of the "Holy Virgin of Jerusalem." The original picture, of which the present is a copy, was believed to have been painted by the Apostles, and brought from Jerusalem to Constantinople in 453, and from thence to Russia with the introduction of Christianity. The fate of the original is unknown, as it fell into the hands of the French when they pillaged this cathedral in 1812. Of the tombs, that in the south-east corner is the most celebrated. This contains the remains of St. Phillip, a Patriarch who was driven from the altar of this church in 1569, and put to death by the minions of Ivan the Terrible, in which respect he may be termed the St. Thomas-à-Becket of Russia. The tomb of this prelate, like that of St. Jonah in the north-west angle, is of hammered or wrought silver. The bleached relics of this saint, in the form of the skull, are exposed through the top of the tomb or shrine, in which position the withered forehead is kissed by thousands of worshippers, from the Emperor and the nobles to the lowliest peasant.

At the foot of the eastern columns, and facing the altar-screen, are two pulpit-like constructions; that on the right is called the throne of the patriarch, and that on the left the throne of the Empress. To the right, and in the same line, is a third, "the ancient throne of the Tsars," or "the throne of Vladimir Monomachis." This is reported to date from the introduction of Christianity in 981. It is a wooden construction, and a work of great labour. The ornament, which largely consists of perforated work, the face of which is richly carved, is strongly Persian in its character, in which respects it reminds one of the wood and ivory carvings of India. In this throne the old Tsars stood in their robes of state, during the celebration of Divine Service. In the south-west corner of the church is a wooden erection, the entrance to which is screened by curtains. This is the "Tabernacle over the Holy Tunic," and at coronations, when the church is seen at its best, it is used as a retiring closet of the Empress.

The east end of the sanctuary is apsidal, and the central point of the same is occupied by the throne of the former patriarchs and the present metropolitan, radiating from which are the seats of the bishops and other dignitaries. In the centre of this holy place stands the high altar, on which is a "Mount Sinai" containing the Host. This is wrought in gold and silver, and on the top is a figure of Moses with the Tables of the Law. The weight of this object is 38lb., half of which is gold, and the remainder silver. Under, or beneath this work, State papers of the utmost value are deposited.

In the northern chapel are three tombs, one being that of St. Peter, the first metropolitan of Moscow, and founder of the church. On this tomb in old times the feudatory princes swore fealty to the reigning princes of Moscow. The altar here, like that of the most southern chapel, although dedicated to different saints, is considered "part of the high altar," placed here that the public may reach it without entering the holy or more private sanctuary.

A word may here be said on the wealth of gold and precious stones belonging to the ancient churches of Russia. In our own land our churches were enriched by gifts of lands, the rents of which paid the fees of the priests for offering prayers for the repose, &c., of the souls of the donors. In Russia a more ancient custom obtains, one seen in the Zazan Cathedral at St. Petersburg, where the Don Cossacks gave the silver for the great screen, to commemorate the campaign of 1812. Gifts of gold, silver, and precious stones are affixed to the Russian shrines, in which position they become objects of awe and veneration to the people, whose visits to the same, with their gifts or tributes, are many and often. In other cases they amalgamate with the relics and treasures stored away to be inspected only on payment of certain fees. It is said, and no doubt with truth, that the interest on lands given to the Western Churches was far less than the interest upon treasures exhibited in connection with the Russian Church.

Such was the known wealth of the churches of Moscow, that they fired the enthusiasm of the French soldiers in 1812; nor were they much disappointed, for, after the most valuable objects had been carried away to distant cities for greater safety, the pillagers are said to have found in this church alone five tons of silver, and five hundred-weight of gold. This is said to have been mostly obtained from the vessels found in the sanctuary; the operation of melting down was being pursued in furnaces erected in the church when the blast of the fatal retreat was sounded, a call that necessitated a great amount of mutilated treasure being left behind by the hosts of the Grand Army.

(*To be continued*).

THE LATE MR. THOMAS H. WYATT.

Mr. THOMAS HENRY WYATT, whose death was recorded last week, had been for some time past in a critical state, suffering from a variety of maladies, though it was not expected by his friends that he would have been so suddenly carried away. Mr. Wyatt was born in Roscommon, Ireland, and his father, Mr. Matthew Wyatt, was a metropolitan police magistrate. Destined for mercantile life, he soon broke away from an occupation that proved distasteful to him, and became a pupil of the late Mr. Philip Hardwick, R.A., who had a large and varied practice both in Classic and Gothic. He was appointed district surveyor of Hackney, a post he held only a few years, and we find him afterwards in a large private practice in Great Russell-street, having entered into partnership with Mr. David Brandon, with whom he enjoyed extensive patronage under the still familiar title of Wyatt and Brandon. During his partnership he was engaged in numerous mansions and church restorations, of which we give a few of the principal—it would be impossible to name them all. Some years ago, after his dissolution with Mr. Brandon, his son, Mr. Matthew Wyatt, joined him. His younger brother, the late Sir M. Digby Wyatt, served his articles with him; also Mr. E. M. Barry, lately deceased, both distinguished for their artistic and architectural acquirements; and it is somewhat remarkable to relate that Sir Digby Wyatt, though he did not live to achieve half the work of his brother, has won an almost European reputation by his literary and artistic works. One of the earliest and best known of Mr. T. H. Wyatt's works was Wilton Church, near Salisbury, a building which soon acquired, in spite of the adaptation of a style which has not taken a deep root in England, a popular notoriety; and which formed the foundation of a large connection in that county. In its design Mr. Wyatt selected the Early style of Lombardy, and no expense was spared by Lord Herbert to make it a thoroughly representative church of the kind. Those who have seen it can estimate the skill with which some of the details, excessively rich in some parts, have been carried out. Mr. Wyatt early interested himself in the promotion of professional union. He was one of the first who came forward to read papers to the Architectural Society, then a young struggling society, and the pioneer of the Intsitute, and of which he was made vice-president; afterwards he assisted to promote the latter, and did much towards increasing the prosperity of the Architects' Benevolent Society. In this society he seems to have taken a special interest, which we should like to see emulated; and was appointed its President. Mr. Wyatt became a Fellow of the Institute in 1838, and at the time of its absorption of the younger society in 1842, he was made a member of council. In 1870 he was elected President of the Institute, and three years afterwards received the Gold Medal. Latterly he was appointed honorary secretary, in the room of the late Mr. Cockerell, and was, until quite recently, an active member in all important measures of reform. Unlike his brother, Sir M. Digby Wyatt, however, he was more retiring, and we are not aware that he contributed anything to the literature of his profession, except in his presidential addresses. His brother dedicated his "Lectures on Fine Art," delivered when Slade Professor, to him, in which dedication he affectionately expresses his gratitude to him for opening the door of the profession, and for other acts of fraternal kindness.

As an architect, Mr. T. H. Wyatt was a skilful planner, though his designs are not distinguished for any marked originality or power of expression. Like other architects of his age, he began with Classic, and the Euston entrance was one of the first designs on which he was engaged while a pupil at Mr. Hardwick's. His works, however, show that he could adapt Gothic as well as Renaissance. We may mention two recent buildings which show the latter spirit—namely, the Knightsbridge Cavalry barracks, lately described in our pages, and only recently completed, and the new block for the Brompton Hospital for Consumption, a large red brick structure scarcely finished. He seems to have built and altered several hospitals. We may name the Middlesex and Malta Hospitals; Cancer Hospital, Osnaburgh-street; Fever Hospital, Stockwell; Salisbury Infirmary; Small Pox ditto; Tetbury Cottage Hospital; Basingstoke Cottage Hospital; Wilts Lunatic Asylum; Buckingham Lunatic Asylum; Norfolk and Norwich Hospital. Among his other public buildings we may mention, Exchange Buildings, Liverpool (with his partner); Recreation Hall and Theatre, Woolwich; Militia Stores, Wilts; Adelphi Theatre; Hull Orphanage; Railway Station, Florence; Ringwood and Cricklehowell Townhalls; Polytechnic Institution; alterations at Institution of Civil Engineers, of which he was honorary architect; Assize Courts at Cambridge, Winchester, Devizes, Usk, &c.; churches at Wilton, Crockerton, Westbury, East Harnham, Fisherton, Laverstock, near Salisbury, Fonthill, Gifford, Warminster, Dorset; besides several in London, of which we may name St. Matthias, Bethnal Green; Trinity Church, Haverstock-hill; also churches in Cambridgeshire, St. Mary-in-the-Fen, &c.; in Ireland; in Flintshire, Montgomeryshire, Merionethshire, Carnarvonshire, Denbigh; in North Britain; in Woolwich (Garrison Church, in conjunction with his brother), and churches in many other counties of England. In alterations and additions to churches Mr. Wyatt's practice was very extensive. In connection with his partner he undertook Wimborne Minster; he also restored Llandaff Cathedral, Great Bedwyn Church, Wilts; Chilmark, and many other churches in Wiltshire, Dorset, and Hants; indeed, among the number of restored edifices in the last-named counties he seems to have had an extensive connection. Of schools and parsonages a goodly number are from his designs; but perhaps the largest branch of his practice consisted of private mansions, of which he designed and altered a countless number. In London he built Sir Dudley Marjoribank's residence, Park-lane; Lord Arthur Russell's, in Audley-square; besides residences for Sir Charles Forster, M.P. Westminster, Sir Baldwin Leighton, M.P. (Berkeley-street), Prince Waronzoff, Duke of Palmella, Mr. T. Protheroe, Mr. J. Morrison (Fonthill House, Wilts), Duke of Beaufort (Brecon), Mr. J. Moraut (Brockenhurst, Hants), &c., &c. In many of these works, as in the last-named, the style selected is Renaissance or Elizabethan. In conjunction with Mr. Brandon he carried out mansions at Orchardleigh, Somersetshire; Broadford, Kent; Abbey Leix and Ramsfort, Ireland; while it would be useless to enumerate the noblemen's and gentlemen's mansions he enlarged and altered.

Mr. Wyatt held many honorary appointments: he was honorary architect to the Institution of Civil Engineers; to the Athenæum Club, of which he was a member; to Middlesex Hospital; to the Salisbury Diocesan Church Building Society; to the Governesses' Benevolent Institution; and consulting architect to the Incorporated Society for Building New Churches. We will only add that Mr. Wyatt was much esteemed by those who shared his acquaintance, and occupied a high position among the architects of the day. His remains were interred at the small village of Weston, near Basingstoke, the church of which he rebuilt; and he was followed to the grave by a few of his oldest friends, among those present being Mr. C. H. Gregory, the engineer; Mr. Hannen, the builder; Mr. Whichcord, the President of the R.I.B.A., and a few of Mr. Wyatt's pupils and assistants.

ARCHITECTURAL NOTES FROM NORFOLK.

LAST week we briefly remarked upon the general programme of places to be visited by the annual excursion party of the Architectural Association now in Norfolk, with Norwich as their headquarters. To-day, it may be of interest if we print a few notes made during the first two days of the excursion. Norwich itself is full of interest, as indeed full of churches, but it is just possible that one may have too much of even a good thing, and the exceedingly large number of churches of but moderate interest as well as quality, pall very readily upon the visitor. St. Peter Mancroft Church and St. Stephen's are undoubtedly fine buildings, and St. Giles at the upper part of the town may in similar terms be described, though the restorer has rendered everything throughout excessively clean and prim, like the new chancel which has also been added. The cathedral claims, of course, primary notice, and therefore, was the first building visited on Monday morning last, when about thirty-five excursionists were met by Mr. John H. Brown, the Cathedral surveyor, who very kindly conducted the party round the buildings. The history of the church has in so many ways already been given and is so readily found in special works on the subject from Mr. Walter Rye's very able little "Tourist's Guide," up to Dean Goulburn's big and learned, as well as copiously illustrated book on the Cathedral and its Sculptures, that any historical or archæological remarks here are as needless as they would be singularly out of place. The west front is now being restored by Mr. Brown, assisted by Mr. James Fergusson, the work in progress being simply to do now what Mr. Blore so very ineffectually did some twenty-five years ago, when he simply cased with sham-pointed slabs the Norman ashlar work of this front, instead of properly making it good. The Society for the Protection of Ancient Buildings, had it existed a quarter of a century ago, would have had here indeed ample cause to taunt the restorer with having spoiled the appearance of antiquity without having put the building into a substantial state of repair. The huge west window, of Perpendicular date, which swamps everything else by its size, is filled with the most hideous painted glass, said to be after Rafaelle; indeed, no more moderate term would adequately express its ugliness. It was here placed by the country gentlemen in 1849 as a memorial to Bishop Stanley, and so when the window was rebuilt a short time since, the glass to which we refer was replaced for fear of giving offence. Surely offence was spared from a very few, while it is now freely offered to thousands, and we question the real policy of allowing such an objectionable feature to remain, at any rate where it is. A complete restoration of the ancient decorative painting to the bosses of the superb vaulted roof of the nave and choir is being effected. After careful examination, no doubt, the cleaning is being very carefully executed, though the colours chosen for the figures seem rather gaudy and hard. From the floor of the building, probably, the tints in time will lose much of their harshness, even if the effect does not equal the simple quietness of the old gilding, at present seen on the untouched parts. The nave is unused for services, and the unfortunate stone screen, of which the upper part only dates from 1833, still remains, cutting the cathedral in two, and quite blocking out the apse and choir. The entrances to the transepts, on either side of the crossing, are filled with stuffy pews, which enjoy a very select sort of privacy, being guarded under lock and key, and on Sunday the cathedral seems to be treated as the parish-church of the chosen well-dressed few, instead of being entirely free and open to all, both rich and poor alike. The floor of the sanctuary has lately been paved by Messrs. Powell, of Whitefriars-street, with some beautifully-executed mosaic, from the designs of Mr. Arthur Blomfield, who also designed the inlaid wooden altar. This latter seems out of keeping with the rest, and we cannot admire it. The same remark applies to the new work in the Jesus chapel, one of the double circular chapels, two of which alone remain, and it has been restored, we believe, chiefly by Mr. Butterfield. The effect of the colour decorations is anything but satisfactory; crude vermilion has been used instead of the soft brick-red orange found in the old work, and which always harmonises so well with almost any other colour without being overbearing in its effect. The blues in the old colour were greenish in tone on the one hand, and on the other exceedingly delicate and grey; but here French ultramarine seems to have been the only blue available for the new work now complained of.

The other chapel of St. Luke, on the south side, is now used as a parish-church for the parishioners of the demolished church of St. Mary-in-the-Marsh, and is unrestored. Here the charming effect of the ancient colour decorations may be well seen, and so may also the atrociously-ugly stone pulpit, of which the less said the better. It was said by Mr. Brown to have been the work of Mr. Parker, of Oxford. Mr. Salvin is responsible for the rebuilding of the south transept front, which was executed in Caen stone, like the rest of the outside walls of the Cathedral; but Norman work only looks ridiculous when built with invisible-jointed masonry, and Norman-charactered clock-fronts are scarcely even considered in good taste or satisfactory. The excursionists visited, on Monday, the whole of the precincts of the Cathedral, and the new Bishop's palace, built by Mr. Ewan Christian, was seen from the grounds. Mr. Phipson has recently built a gay-looking residence on the south side of the Cathedral for one of the Canons, and Mr. J. K. Colling is now erecting a very common-place, box-like house, in red-brick, on the west, for a similar purpose. St. Peter Mancroft Church is now being very carefully renovated by Mr. G. E. Street, R.A., and, when the singularly-beautiful tower of this church has been restored to its original form, the church will be one of the finest parish-churches in the kingdom, as it is now the type of all the churches in Norwich, and the best of them all.

On Tuesday, the excursionists left by train for Aylsham, where carriages were in waiting for the rest of the day's trip, which included Aylsham, Cawston, Salle, and Blickling. Aylsham is a quaint village, having a red-brick Inn ("The Black Boys,") with a quaintly-ornamental plaster cove, over a pilastered front. The church, of which John of Gaunt is the reputed founder, is chiefly fourteenth-century in date, and was well restored in 1854 by Messrs. Raphael Brandon and Ritchie. It is a cross church on plan with aisles throughout, and contains a font and rood-screen of remarkable beauty. The buttresses on the south aisle are good examples, and the Jacobean pulpit is interesting. The new seating is very ugly owing to the "unrest" effect of the little bosses on the top members of the backs and ends which, when seen from the end of the church, have a very singular appearance. The carvings on the font deserve particular attention. Cawston Church was next visited, and on the whole afforded more interest than any of the churches seen on Monday. The road from Aylsham passes through a very charming and well-wooded part of the country. The church is a very good perpendicular building containing a magnificent roof, one of the finest of its date in England. It has double hammer-beams which singularly project beyond the queen-pests, and support rich full-length angels displaying the heavenly hierarchy. The massively-rich and deep cornice below deserves special notice, with its flatly-treated series of angels, small shields, and fleurs-de-lys. Mr. Phipson has reported on the condition of this roof with a view to its restoration, and if only his report is thoroughly carried out there will be but little reason to complain, and, anyway, it is certain that something must soon be done, as the timbers continue to fall and the roof soon will become dangerous. The rood - screen is remarkable for its very beautiful figure decorations, which, unfortunately, have been much disfigured both by time and by want of care; for instance, the late rector had the school-children seated next against it, and, of course, during service, they found much amusement in picking off the colour and gilding. Sir John Shorne's figure has especially suffered from the above cause. Sir John was an Augustinian Canon of Dunstaple at the end of the 13th century, who is said to have conveyed the devil in a boot, and having crushed the fiend with his foot, became controller over the disease called gout, and so is usually represented holding a boot from which the devil is peeping. He was also "much sought for the agew." Salle church (pronounced Saul) is throughout Perpendicular, and undoubtedly is a magnificent building. It stands on high ground and commands a fine view, and, together with Cawston church, may be taken as an excellent example of Norfolk Perpendicular work. The roof of the former-named church was always the finer of the two, and it may be here mentioned that some good drawings of it were recently published in the Architectural Association sketch-book, by Mr. Stokes. It should also be recorded that an unusually fine leathern box for the preservation of the altar plate remains, of 13th-century date, at Cawston, and it is of singular beauty. The dirty condition of Salle church is a great disgrace to all concerned, and the ruinous state of the roofs need immediate attention. We have seldom seen a more beautiful church, and certainly never a more neglected or dirty one. Want of space prevents our giving a minute description of the building. Blickling Hall, one of the finest old brick mansions to be found anywhere, was next reached. Here the Marchioness of Lothian most graciously met the excursion party, and conducted the visitors through the several apartments, describing every feature of interest, and at length explaining the panels in the library, which is a magnificent Jacobean specimen of plaster-work no less than 120ft. long. A good detailed description of the subjects illustrated in the panels of this ceiling was published in the *Antiquary* for June this year. Blickling Hall was built by Chief Justice Hobart, in the reign of James I., but was not completed until 1628, and the west front was rebuilt after fire in 1769. The house has a special interest as having been anciently the seat of the Boleyns, Anne Boleyn having been born here. The house preserves its antique character, and, as seen from the road, with its wide double-quadrangle approach, is exceedingly picturesque. There are numerous projecting oriel windows and curved as well as pointed gables. The entrance is by a central porch divided from the house by an open cortile. The rampant bull rules everywhere, and is represented in a masterly way on the piers on either side of the bridge before the entrance. The carvings throughout the house are remarkably good, and delicately executed. The clock-tower over the entrance is quaint, and groups well with the end pavilion-like towers at each angle. The gardens are kept in singularly good taste, and the house throughout is beautifully furnished. Mr. Hungerford Pullan, of South Kensington Museum, renovated the library and decorated its walls. The general effect of the decoration is good, but will not bear a detailed criticism, as the work in parts is too vivid in colour, and very incongruous in style. The book-cases are out of character, but the painted glass at the end of the room is very good. Mr. G. E. Street restored Blickling Church four years ago, and built a west tower in memory of the late marquis, to whom an elaborate tomb is erected in the church by Watts. The party of excursionists reached Norwich after a long day-trip. Mr. James Fowler, of Louth, and Mr. F. C. Penrose were among the party, which is presided over by the president of the year, Mr. E. C. Lee.

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THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT DEVIZES.

[FROM OUR OWN REPORTER.]

THE thirty-seventh annual Congress of the British Archæological Association is being held this week in the quiet capital of North Wilts, under the local presidency of Earl Nelson. Devizes has evidently been built in horseshoe form around extensive earthworks of defence, placed at the angle of meeting of two deep ravines. The simple earthen mound was fortified, and became a castle of masonry; two large churches were built in the 12th century in the town, on the high promontory behind, about the time when the first charter of incorporation was granted by Henry I. Beyond these churches and the scanty remains of the castle, there are few objects of antiquarian interest in the town, which is best known as the great corn-market of the district. The name of the head-quarters of the Congress, the Bear Hotel, is associated with the early life of Sir Thomas Lawrence, whose father was its landlord during the youth of the future P.R.A. and fashionable portrait-painter. The chalk districts, with greensand faults on the east of Devizes—divided by a well-watered valley into the Marlborough Downs to the north and Salisbury Plain to the south—are, however, weirdly attractive to that class of archæologists who seek to unravel the modes of life and burial of those who lived in the so-called "prehistoric" past.

No portion of England is so rich in traces of the aboriginal inhabitants, and their successors—of the Belgæ, the Romans, and the West Saxons; stone and earthen circles, long lines of boundaries, ramparts and ditches, pit dwellings, and British ridgways and Roman-paved roads, mounds, and cisted tumuli are numerous, and have been well preserved. The features of interest are not confined, however, to pre-Norman buildings and earthworks. A number of churches of a well-marked type, chiefly of the 13th and 15th centuries, and the remains of several Benedictine establishments are set down on the programme, together with a few specimens of half-timber houses, and some of the modern mansions are to be visited in the course of the Congress. The district covered in the excursions, which are nearly all by carriage, is unusually compact, in no case overstepping the county borders, and being almost confined to the northern division.

MONDAY.

The Congress was opened on Monday afternoon with a meeting in the Town Hall, at which the members of the Association were welcomed to Devizes by the Mayor, Mr. T. Chandler, and by the flourishing Wiltshire Archæological Society, represented by the Rev. A. C. Smith, who gave a rapid sketch of the chief points of interest in the ground covered by the excursions, and the Rev. H. A. Smith. The corporation plate and muniments were afterwards viewed in an adjoining room; they include charters of Henry III., Henry VIII., Elizabeth, Charles I. (two), and James II., an illuminated copy of the earlier charters made in the 17th century, fortunately, as it proves, for the charter granted by Queen Maud is now missing; a verderers' cup of silver, dated 1606, a crowned silver gilt mace, presented in the year of Restoration, and another of more recent date.

St. John the Baptist's Church, near the Castle, was then visited and described by the Rev. J. Hart Burges, D.D. It is a cruciform edifice, with lofty central tower. This tower, and the transepts, and the chancel are chiefly of Late Norman character. On the north-west angle of the tower is an external belfry staircase, rising as circular turret above the pinnacles, of a rich character. The nave is long, and has been rebuilt in the 15th century, and lengthened very recently, and north and south chapels, with rich oaken ceilings, were added to the church in the 16th century. The chancel is low, and consists of two bays, still retaining their Norman transverse vaulting. The east end has modern intersecting arcading, copied from a Norman fragment on north wall, and coloured with bright tones, now happily fading. Dr. Burges ascribed the eastern part of church to the time of the Militant Bishop, Roger Poer, of Sarum, Chancellor to Henry I., c. 1130, and stated that he proposed to open the lantern of tower, and so reveal the beautiful Norman arcading in the upper part, now hidden by a lath-and-plaster ceiling, and to remove the colour from the chancel and to place in the west window stained glass by Messrs. Hardman, of Birmingham. Mr. E. P. Loftus Brock, F.S.A., remarked that it was a typical and fine example of the Wiltshire church, a cruciform building, enlarged in the 15th century. An unusual feature was the central tower, which was oblong on plan, and the narrow arches to the transepts were pointed, whereas the wider ones to east and west were circular, but with precisely similar mouldings. From this introduction of the pointed arch, and the use of the billet and other mouldings, the date must be later than that mentioned by Dr. Burges—probably it was built between 1152 and 1160. Again, there were traces of aisles to the Norman nave in the windows on west face of south transept—probably small low lean-to's, above which the central tower, the highest Norman steeple in the South of England, rose with fine effect. The south chantry chapel would repay examination, as one precisely similar in ornamental details, and also built by a Beauchamp, would be seen at Bromham on Saturday. Mr. Lambert, F.S.A., disputed whether the Norman nave was ever finished, and suggested that the monks gradually built just the parts required for worship—the chancel and transepts, and the nave was left perhaps till the 15th century. A local gentleman, however, stated that when the arcades were recently repaired, the bases of Norman pillars were found under the present octagonal piers—proving Mr. Brock's hypothesis that nave-aisles were at least contemplated by the founders. After some discussion, the members proceeded to *St. Mary's Church*. This was also a Late Norman structure, but of a more usual type, and the clerestoried nave and its aisles were rebuilt in the 15th century, the old footings and buttresses, as Mr. E. Kite showed, being utilised on the north side. An unusual feature is a well-carved statue of the Virgin and Child, placed under a rich tabernacled canopy on the east wall of nave, in the position often occupied by a Sanctus bell. On the south of nave is a rich Early English porch, originally, according to Mr. Bron, an inner doorway, but removed and rebuilt in clumsy fashion at some unknown period. The usually accurate John Britton mentions a north porch, which does not exist. The chancel, like St. John's, is extremely low, is also square-ended, and has transverse groining. Dr. Burges mentioned that he had also restored this church four years ago, without the assistance of a professional architect. Beneath the plaster ceiling of nave he found the present fine Perpendicular roof, with decorated tie-beams, resting on corbel heads. The date was fixed by an inscription on the second beam: "William Smith, qui istam ecclesiam, fieri fecit, MCCCCXXXVI." The chancel walls were 4½ft. thick, but the masonry was very bad, only the outer faces being properly laid. Mr. Brock remarked upon the less-finished character of the Norman work here, although of about the same date as St. John's. He suggested that Devizes must have been far larger than was generally assumed at the time of Maud's grant of a charter of incorporation. The *Castle* was next visited, under the guidance of the occupier, Mr. R. V. Leach, who, during the past twenty years, has built, from his own designs, a modern mansion into the ruins, and laid out the grounds as a landscape garden. The central mound, the inner bailey, and the two lines of valla, separated by a rampart, can still be clearly distinguished. The present castle, in which Norman balustered fenestration is picturesquely combined with Edwardian bastions and machicolated turrets and balconies, stands on the west side of a site which, roughly speaking, is a triangle with rounded corners, and may represent on plan the domestic offices of the Mediæval building; to the south are remains of what seems to have been the undercroft of the great hall. The castle is said to have been founded by Bishop Roger Poer, and was gradually dismantled after the reign of Edward VI., and the keep was besieged by the Parliament in 1643, and taken two years afterwards. Mr. Leach conducted the visitors over the building, which is a very storehouse of old china, paintings by old and modern artists, armour, wood-carving, &c., in a "secret chamber," approached by a (modern) sliding door, and built upon the only inhabited ancient part of the castle, is a museum, filled with bones, Roman coins, Samian ware, Anglo-Saxon pottery, British spear-heads and celts of flint, all found in the grounds by Mr. Leach or the workmen. In the grounds are one or two gateways built of Late Norman carved stones, removed from St. John's Church during recent restoration, and Mr. Leach, on being rallied on the subject, explained that undoubtedly the castle formed a quarry for church repairs in the past, and some of the fragments were only returned. At the close of the visit Mr. Brock suggested that the castle was built upon earlier earthworks, and that this would account for the extensive mounds and ditches by which it was defended; the trenches were found when the tunnel of the Great Western Railway was pierced beneath the castle to be excavated 45ft. deeper than the present levels. Besides this, Mr. Leach's museum showed that the site was occupied successively by the British, the Romans, the Saxons, and the Normans, and compared the castle with that at Norwich and others. A few of the members visited the Museum in St. John's-street, the chief attraction in which is the Stowehead collection, formed by the Wiltshire historian and antiquarian, Sir Richard Colt Hoare and his friend, Mr. William Cunnington, of Heytesbury, at the beginning of the present century, and which within the last 18 months has been rearranged and presented to the county by Mr. Henry Cunnington. It is exclusively composed of pre-Norman objects found in the county, and includes the largest collection of gold ornaments—lozenge-shaped plaques, rings, and pins—in the world; many cinerary urns, bronze and flint dagger-knives, beads of amber, glass, gold, and bone. There are also a large collection of bronze vessels, Samian ware, and was found on the premises of an iron-works company at Westbury. Some of the most recent additions to the museum are the contents of a tumulus at Rochley Down near Marlborough, opened by Mr. W. Henry Cunnington last autumn; beneath the mound was a primary interment containing the perfect skeleton of an adult male, placed in kneeling posture, the head resting on clasped hands. Over this were secondary interments, consisting of two cinerary urns, one 16in. high and 13in. across, the other 9¼in. high, and a small food vessel. The skeleton is in excellent preservation.

INAUGURAL ADDRESS.

In the evening, Earl Nelson delivered his inaugural address at the Town-hall. He dwelt at much length on the advantages which had been derived from the study of archæology, remarking that during the last half-century the history of this country had been really re-written by the means of archæological research. These recurring meetings, though they might be held amidst scenes often visited and reported on before, had a greater work to perform than was at first apparent. It was much more than a pleasant picnic, much more than the additional pieces of information that might be gathered upon each fresh visit and from the valuable papers which would be read. Its greater work was a missionary one, and the zest that such meetings gave to all to become antiquaries, to gather together little bits of their family history, and of the history of their respective parishes, to support the local association, promote the circulation of their archæological and natural history magazine, and contribute to its pages. A mass of information was gathered together from time to time, which helped to elucidate different obscure parts of history, and had already, through the *Wiltshire Magazine*, added much to the materials for a county history which, with much less labour than Sir Richard Colt Hoare and his noble compeers bestowed, would greatly enlarge and illustrate the work associated with his name. A well known archæologist, Canon Jones, of Bradford, was on the point of bringing out a most interesting book on the original uses of the different parts of Salisbury Cathedral, with a second volume on the whole religious history of the diocese from the earlier times. In reference to the ecclesiastical branch of their subject, he illustrated by two instances how a true knowledge of archæology would have had an eminently useful purpose. When restoring Salisbury Cathedral a natural desire expressed was by the laity that they should not have a closed choir, and that they might have seats, if not in the choir, at least in the north and south-eastern transepts. Both these demands were looked upon as contrary to old arrangements; but Canon Jones's book would show that at Salisbury the returned stalls were a mistake, as it was a foundation of secular canons, and that in the original design the laity sat in the presbytery and the two eastern transepts, thereby surrounding the altar. There was a direct order in part of the old Sarum Use that the priest walking round the altar should incense the people in the transepts and in the presbytery. The other case he adduced was the use of colours at the different Church festivals and seasons. The colours adopted by many in ignorance of the subject were taken from the modern Roman Use, whereas the old colours of the Church of England, as taken from her old service books, pointed to the part Gallican and part Eastern origin of their Church, and gave an additional proof of her independence of Rome. In these two instances it was clear that a true knowledge would have avoided a cause of offence, and, if the deductions of Canon Jones were correct, would have shown that a desire to act according to the old order of things would have been in favour rather than against the natural desires of the people. His lordship then proceeded to point out that they might assist in promoting archæological lore by preserving the old names of the different fields and farms. Every field had a name, and many still retained them by mere tradition among the old labourers, and in the old parish maps and terriers. Some of more modern date only referred to the size of the field on its comparatively recent allotment, such as "Hundred acre," on his estate, which was a very small plot, and was originally "under acre," and "Ten furlong," or the like; but there were much older names than those, and if they ever attempted to walk the bounds of an old Saxon charter many of the old names, if kept, would help out the boundaries, and the specified points on the boundary would give a point and an explanation to the names. Whelpley, Wellow, Landford—once spelt with two ll's—were a proof of the British being originally to the east of their Christ-Church Avon. Cerdic's battle at Charford drove them to the other side, and caused the succession of forts from Old Sarum down the valley protecting the western lands to which they retired. A few years ago, in digging in a rabbit burrow, Lord Radnor's keeper came upon an old Saxon chief, with his sword by his side, who had evidently fallen in the moment of victory in the middle of the fortified pah he had taken from the British—following up the successes of Cerdic, and driving the Britons on the other side across the river at Britford, as it was still called. His lordship then proceeded to refer to some of the places of interest which it was the intention of the archæologists to visit. Referring to the tumuli, he said those on the Wiltshire downs had been sufficiently excavated, and he thought nothing could justify the profanation of old burial-places when there was a certainty of no new discovery being made. He did not see, however, why a careful tunnelling should not be conducted under the so-called altar-stone at Stonehenge, to see if any remains which might illustrate the age of Stonehenge could be found there, or within the sacred circle; and, secondly, he advocated the replacing of those stones which had fallen within man's memory, and a record of which had been carefully preserved. The mechanical appliances of the present day could easily re-erect them. The necessity of something being done to preserve the ruin as handed down to us was becoming more and more pressing. One of the great stones was gradually leaning more heavily on a stone of the inner circle, and it might come down any day. Some means should be taken by artificial supports to prevent that catastrophe, and he could not see why, when that was done, they might not have those stones replaced whose position was clearly known, and whose fall had been carefully recorded. Having commented on the programme, the earl said he earnestly wished them a happy and successful meeting, and he should be fully justified if under his presidency many of the small fry learnt their own usefulness and resolved to put their shoulders to the wheel and endeavoured to collect and preserve all such monuments of the past as came in their way, so as to bring them under the notice of the greater *savans*.

In the evening a dinner was held at the Bear hotel, under the presidency of Earl Nelson.

TUESDAY.

The excursions were commenced by an eleven hours' carriage-drive to a group of villages on the south-west of Devizes. *Potterne Church* was the first halting-place. It is an unusually perfect specimen of a middle of thirteenth-century cruciform church, the only later features being a pierced and embattled parapet and pinnacles to the broad central tower and the south porch. The windows throughout are all lancets; the treatment throughout is simple but dignified. A bold string-course without, and a double one within, surround the building. During a restoration, eight years since, under Mr. Ewan Christian, while excavating under the present font, another and much earlier and ruder one was found buried beneath, and is now placed to the west end of nave; it is almost of the form of a gallipot, 26in high, and 35in. across at rim, and has upon the rim an early Latin version of Ps. xliii. 1. Mr. Thos. Morgan assigned this font, from the lettering, to early in the 10th century; other speakers differed as to its date —either Anglo-Saxon, or rude Early Norman. *Porch House*, a picturesque half-timbered range of buildings in the village-street, was next seen. The house is an excellent specimen of the better class of dwellings erected in the 15th century; having the characteristic projecting upper story corbelled out on the floor-beams, and having gables ornamented with good bargeboards. Within the original hall, on ground level, and occupying the whole height of building, remains intact, except that the roof pendants have been removed, at one end being the withdrawing-room, with bedrooms above at the other, beyond the screen of the domestic offices. The Rev. H. A. Olivier explained that the house for a long time was known as "Ye Olde White Horse Inne," and ultimately fell into his father's hands, when it was partially restored, a work completed by Mr. G. Richmond, R.A., who has since purchased it, and has carefully reinstated it, laying figured tiles on the ground-floor, and remains of old stained glass, collected from many sources, in the windows. The trim terraced grounds of *Eastwell* House, for many generations the seat of the Grubbe family, were next visited, and in passing through *Erlestoke*, a new church in stone, of Late 14th-century type, with low tower to south, and a brick and tile-hung vicarage, both from the designs of Mr. Street, R.A., were seen to be in course of completion.

EDINGTON CHURCH.

This noble Priory Church was the most interesting building seen during the day. It has been illustrated and described as a typical-dated building, showing the process of transition from the Decorated to the Perpendicular. Mr. J. H. Parker has shown the west front in his "Introduction to Gothic Architecture," and in the Building News for July 12, 1872, will be found double-page drawings of the exterior, for which the late F. C. Deshon was awarded the Institute prize. It is of the cruciform plan usual in the locality, with large chancel and transepts, aisled and clerestoried nave of six bays, central tower, and south porch of three stories. The tracery varies from flowing lines in the west aisle windows to a rigid well-developed Perpendicular in the great west window and elsewhere, and, as Picton showed, the mouldings are similarly progressive. An embattled parapet is carried round the building, inclosing the lead roofs, and is repeated on the tower. The west front shows threatening signs of settlement, and on entering further symptoms of need for restoration are apparent. In the chancel are a series of canopied niches between the windows, with tabernacled heads, and in two of these headless figures remain. On the east wall is an elaborately-carved wooden reredos, of very Late Jacobean character, seeming, from the central pilaster and keystone above, to have formed at one time an excellent chimney-piece. The large rood-loft is perfect, but beneath it is an incongruous wooden screen, and upon it boards figured with the Royal arms, and dated 1788, the Commandments, and Creed. The nave has a singular wooden ceiling of Debased character, with plaster panels, and has a small west gallery, high pews, balustraded platform round font, tablets on the piers, white-washed walls, and other tokens of an "ante-Restoration" period. On the base of the former churchyard cross, opposite the south porch, Colonel Bramble gave an address on the history of the church. It was built by William de Edington, Bishop of Winchester, in the short space of nine years, having been founded in 1351 and dedicated in 1362 as the church of an Augustinian college; but the establishment was soon changed into a priory of Bonhommes, a French order, of which the only other known English houses were those on College Green, Bristol (now the mayor's chapel), and Ashridge, in Bucks. Having described the church, Colonel Bramble referred to the dangerously dilapidated state of the west window, and referred to the monuments, specially mentioning the last work executed by Chantrey, a group on the north chancel wall, showing the death-bed scene of Sir S. R. B. Taylor (1815), a monument to Edmund Lewys, tempo. Charles I., and his wife, the Dowager Lady Beauchamp, and a singular caricature of the same monument in the nave, erected within recent years to the Taylor family, in which a panel of the procession of father, mother, and children, with weeping angels at either end, is repeated, the Taylor figures being in the ordinary yeoman costume of 40 years ago. In the south transept would be seen a monument to one of the priors, the only memorial to one of that order in England; it was much defaced, and had repeated on it the rebus of a tun, with three sprays of leaves growing out of it, and the monogram "J. B."; the suggested explanations, "Baiuton," "Beckington," or "Treeton," did not correspond with any name in the tolerably complete list of "Rectors of Bonhommes." There was also in the centre of the church an altar-tomb to a Cheverel, on which were two canopied pews, apparently of the same date. The Rev. H. Cave-Browne-Cave said it was proposed to restore the church, and appealed for funds towards the £7,000 required. Earl Nelson observed that the church was far too large for the villagers' needs, nor could they keep it in repair, and he thought the preservation of such a valuable historical document as to the change of style was not merely a county, but a national, undertaking, and introduced Mr. C. E. Powell, of Chancery-lane, W.C., who had prepared a preliminary report, pending the appointment of a restoration committee. Mr. Powell said he should propose a strictly conservative reparation of the edifice, underpinning the west front and carefully rebuilding the window, which was being shattered; removing the monuments from the tower piers and making them good, and taking ten or eleven coats of whitewash from inner wall. The nave roof and ceiling were evidently the result of two alterations of the sixteenth century, and, notwithstanding its debased character, he should not allow more than repair. Some of the late panelling in the church could be utilised in a proposed vestry, to be built on the old priory foundations, at the angle of north transept and chancel, in place of the wooden room now shut off in this transept. Earl Nelson remarked that it was plucky of an architect to discover his proposals for restoration to archæologists. Mr. Brock commended the spirit of the report, and after supplementing the descriptions already given of the church, called attention to the decaying and battered condition of the parish registers, arising from the neglect of former vicars. Mr. J. A. Picton, F.S.A., followed, and, directing attention to the three-storied south porch, said the upper chamber of this and similar porches had been called "parvises" by modern archæologists, who took the term from a well-known passage in Chaucer. He challenged them to produce an ancient authority for the use of the word. A "parvise" was simply an inclosed space at the west end of churches, used for festive meetings, and occasionally as schools. The upper parts of porches might be, and were, used for these purposes in France, but were not in this country.

The remains of the Priory, on the north of church, were afterwards examined, it being shown that the nave-windows were kept high above a string-course on this side, to allow of the pent roofs of the cloister, and the monks' entrance from dormitory into transept, doorway into aisle, and other traces were described by Col. Bramble. On part of the site a farmhouse, with gabled front, recessed between two low square embattled towers, has been built from the débris. It contains some good panelled work and plastering of Late 16th-century character. The monastic fish-ponds, still stocked with tench, the buttressed and coped stone wall now enclosing an orchard and a conduit, from which run two supplies of water, one said to be hard the other soft, but the tasting of which provoked amusing diversities of opinion, are almost the only other traces of the Bonhommes' establishment.

After luncheon, the Rev. A. C. Smith, of Yatesbury, gave an address on Bratton Castle, the next place to be visited, explaining that the "castle" consisted simply of earthworks on the crest of a commanding down, and presumably of British origin. He claimed that this was the site of the decisive siege and victory gained by Alfred over the Danes in 878, at the place described by Asser, and the Saxon chronicle as "Ethandun." Mr. Brock agreed that the site was British, and Mr. Myers, F.S.A., advanced the theory that not only the camps and stations, but the reputed roads of the Romans were merely utilisations of British ways and stations. Mr. Picton asked for proof of this, either from documents or British remains found on the roads, and said, on the contrary, these roads agreed precisely with undisputed Roman works of engineering in Italy, France, and Germany. The "Castle" was then visited; it occupies the crest of a steep down, from whence a wide view was obtained to south and west, to Landsdown-hill, and Stourton Church. On the hill slopes it is defended by a ditch and vallum, but on the north-east, where the approach is easy, there are double ramparts and a large outwork strengthened at the two entrances. On the slope beneath is scored in the chalk the well-known "*White Horse of Westbury*," which was recut a century since, when it was doubled in size and made to face west instead of east. The outline is very tame and prosaic; the extreme dimensions are 170ft. in length by 160ft. in height, and since 1873 the outlines have been maintained by stone edging.

On the return journey *Steeple Aston* Church, a fine example of Late Perpendicular work, with lofty west tower, and pinnacled and battlemented nave, aisles, and chancel. The Rev. — Crawley explained that the village was originally Staple or Market Ashton. The large "steeple," from which the name is popularly derived, was formerly capped by a spire 93ft. high, which was struck by lightning in July and October, 1670, and destroyed much of the church. The aisles are groined in stone, and the nave in wood on stone springers. Similar stone groining was added to chancel when restored from Mr. Clutton's designs a few years since, and the nave has been restored by Messrs. Giles and Gane. Near the church in the village-street is a large cross, built or rebuilt in 1673, and finished above the shaft-stone ball and sundial. *Keevil Church*, an Early Perpendicular transepted building, with good west tower, was next seen, and in the village a well-restored 15th-century half-timbered house, having a central hall, as in the Potterne example. Opposite this was inspected the *Manor House*, the seat of Mr. Beach, M.P., was erected for the Lambert family late in the 16th century, and presents four gables on the chief front, and three on each wing. The main entrance is under a lofty Jacobean porch, known to have been added in 1611. The principal rooms are wainscotted, and contain a large collection of paintings, china, and old domestic furniture. The garden is of a formal character, in keeping with the house, and is noteworthy for the numerous and large clipped yews. Time would not allow justice to be done to the last church on the programme, that of Poulshot, which is an interesting example of a small unrestored church, still containing the cumbrous west gallery, the whitewashed vaulted ceilings, and the candelabra of 40 years ago; there are Jacobean pulpit, font-cover, and chancel-rail, and pews of medium height. The incumbent, the Rev. H. A. Olivier, briefly indicated the chief features, showing that it was an Early English church, remodelled in the 16th century, when the north aisle was reduced in width, the chancel lengthened, and two-light windows renewed.

In the evening a meeting was held at the Town Hall, when papers were read by Mr. J. A. Picton, on "The Ethnology of Wiltshire, as illustrated in its Place Names," and by Dr. Stevens, on "Discoveries of Palæolithic Flint Implements, with Mammalian Remains in the Reading Drift." Each gave rise to some discussion, in which the president (Earl Nelson), Messrs. Myers, Wright, and others took part.

WEDNESDAY.

The day was devoted to a long carriage excursion to the mysterious circles at Avebury and to the mound at Silbury, declared to be the largest artificial hill in Europe, wih a few exceptions in Southern Russia. Leaving the Market-place at Devizes at 9 a.m., the members proceeded to the fine cruciform church of *Bishop Cannings*, commenced at the close of the 12th century, but the nave was raised in height by a clerestory and aisles, added to it 240 years later. The nave is of five bays, divided from the aisles by cylindrical piers, carrying unmoulded pointed arches upon the plain central tower, and has a later stone spire set within a poor parapet. The chancel is groined, is square-ended, and has a Lady-chapel on north. The south porch is Flowing Decorated in character. Mr. Brock called attention to the simple character and deep mouldings of the Early English work, and showed that in the chancel the lancets and string-course were insertions in an older, probably Saxon, wall. Some discussion arose on a peculiar wooden stall in the north transept, at the back of which is a panel inscribed with a series of short dedicative inscriptions in Latin. It has been called a confessional and a meditation chair; but Mr. Brock showed that the framing was modern, that the painted panel was formerly rebated to others, and that it was probably part of a rood-screen, but certainly was not till quite recently a chair. After visiting the church, the *WansDyke*, which may be traced through Wiltshire for ten miles, and less perfectly from the Bristol Channel, was visited at Shepherd's shore, near its intersection with the Roman-road. This earthwork, considered by Dr. Guest to have been the last frontier of the province of the Belgæ, consists of a rampart and ditch, the latter placed to the north, clearly indicating that its defensive purpose was to guard a people dwelling in the south, and it is carried in an irregular line along the hills from east to west. After a discussion by the Rev. A. C. Smith, Messrs. Picton, Brock, J. T. Burges, and Morgan, the members proceeded across the Roman road, which was shown by Rev. A. C. Smith to run in a direct line for Silbury, but to turn abruptly to the south to avoid it. At Avebury the plans by Dr. John Aubrey (c. 1660), Dr. Stukeley (c. 1743), and Sir R. Colt Hoare (c. 1812), were explained by the Rev. A. C. Smith. The interest attaching to these old surveys and conjectural restorations is very great, as the circle is the site of a comparatively modern village, and has, therefore, been greatly injured.

Mr. Smith showed that the inclosure on which the members were assembled was an outer mound, 30ft. high, with deep ditch on inner side, in all 70ft. in height. Within this are a few of the original ring of huge stones, which surrounded the smaller circles, one of which had one central stone, the other three central stones. Two avenues once led to south and south-west. The stones were sarsens, brought a distance of a mile and a half from a torrent bed of boulders at the junction of the valley. The largest stone left weighs, according to Mr. Wm. Long, 63 tons, and one of 90 tons was destroyed a few years ago. He claimed that this was a more important monument than Stonehenge, although less known, and that it was far older was evidenced by the fact that these were rude unhewn stones, set on end, while those at Stonehenge exhibit marks of chiselling. The Rev. Bryan King described recent discoveries of broken sarsens, pottery, and deers' horns in the inclosure, and Mr. Picton gave an address, in which he claimed that this was a great amphitheatre, and that these circles were connected with the primeval religion of the world. Mr. J. T. Burges spoke upon the earthworks. Dr. Stevens showed that all these circles were based on multiples of three, and referred to the mystic properties of the number.

Mr. Morgan suggested that "Abury" was derived, not from the Saxon *ea*, a river, but from the Icelandic root *aar*, a year, and that the name meant a yearly assembly of people. Mr. Cunnington remarked that the sarsens were remains of a layer of sandstone which once overlaid the chalk, and regretted the removal of so many sarsens from the valley for building purposes, but that had recently been stopped. Mr. Brock raised the theory that this was a temple, and that this formed part of a serpent, of which the head exists on Overston Hill, and in this Messrs. Smith and Cunnington concurred. It transpired that the site has been recently purchased by Sir John Lubbock, M.P., to preserve it from desecration. The members then visited the principal stones in the village, including two in a farmyard, which stood in the centre of the northern circle, and the two other unusually large stones at the south point of the outer ring, which indicated the entrance to the Kennet avenue. In the afternoon the parish-chuch of Avebury was visited. It is internally in a white-washed and dilapidated state, preparations having been made for restoration from the designs of Mr. R. J. Withers, of London. It has suffered much from alteration effected by Mr. Button, a builder, of Calue, in 1810, who replaced Norman arcades to nave with pseudo-Classic columns, but in the present alterations traces of the former arcade figured by Britton, and to the west of these older and plain arches on either side; the chancel was a lower level than the nave, as at Bradford-on-Avon and all other Saxon churches. During the work fragments of a 15th-century rood-screen, of good design, was found to have been worked into seats and galleries. Mr. Withers' detailed drawings and restorations were published in the Building News for Nov. 25th, 1879. Having seen Avebury, the Manor-house adjoining, built in 1601, on the site of a small priory, and now the residence of Mr. Kemm, now being restored from designs of Mr. Ponting, of Marlborough, the members drove through the Kennet Avenue to the supposed head of the serpent of stones, and, afterwards, to Silbury-hill, at both of which places further explanations were given by the Rev. A. C. Smith, and others. Afterwards an imperfect circle of very small sarsens, on a down a mile south of Silbury (which forms a direct line with it and Avebury), was visited, under the guidance of the Rev. A. C. Smith, who discovered it, and pointed out the similarity between it and the small stone circles of Jutland.

In the evening a meeting was held at the Town Hall, at which Mr. J. T. Burges read a paper on "The Ancient Fortifications, with Particular Reference to the Castle of Devizes," in which, after tracing the history of British castles from the rude mounds and earthworks of the Britons, ditches and palisades of the Saxons, and so to the Norman castles, he showed that many of these mounds were included, as at Leicester, Warwick, and other places, within the lines of the subsequent Norman castle, which without having any keep or other bearing upon them; for instance, Canterbury where the "Danejon" mount was at a considerable distance from the castle. He showed how the Norman castles were defended by stockades and moats. Coming to Wiltshire, he showed that the British forts were taken and subsequently occupied by the Romans under Vespasian; and finally dealt with Devizes Castle, elucidating its form by plans of Hedingham, Ludlow, and Kenilworth, &c., and having drawn a sketch plan of the building, traced its history from the date of its erection on an older mound by Bishop Roger of Sarum; its use as a prison, the seige it resisted in 1643, and its demolition three years afterwards. Mr. Brock afterwards read a paper on "The Recent Discovery of a Viking's Ship in Norway," illustrated by drawings and specimen fragments of the vessel. In the afternoon the parish-church of Avebury, a Norman edifice with later additions, was visited. The Perpendicular rood-loft was discovered during a recent restoration to have been worked up into seats and galleries; detailed drawings and the proposed reconstruction by Mr. R. J. Withers, the architect for the restoration, were published in the Building News of November 25, 1879. Having seen Avebury House, the residence of Mr. Kemm, the members drove up the Kennet Avenue to Silbury Hill and the stone circle opposite, where further explanations were given by the Rev. A. C. Smith and others. In the evening a meeting was held at the Town Hall.

THURSDAY.

Yesterday the programme provided for an excursion from Chippenham to Bradenstoke Priory, passing through Langley Burrell, Draycot, Sutton, Benger, and Christian Malford. At the priory explanations were to be given by Mr. E. P. Loftus Brock, and carriages were resumed to Malmesbury, where, after a luncheon to be given by Mr. W. Powell, M.P., at his reading-rooms in the town, the Cross, Abbey House, and Abbey were to be visited. We shall give full particulars of the visit in our next issue.

To-day (Friday) Stonehenge is to be visited, a detour being made *en route* to see Amesbury Church and Vespasian's Camp, and lectures have been promised by Mr. William Long, F.S.A., the Rev. A. C. Smith, and Mr. Thomas Morgan, F.S.A. On Saturday the proceedings will commence at Bromham Church, to be described by the Rev. E. B. Edgell, a Roman villa and pavement, and some Mediæval houses being also seen in the village. At Zowood House the collections and the gallery of historical pictures will be inspected, by permission of the Marquis of Lansdowne, and after a visit to Spye Park old gate the carriages will be resumed to Lacock, where the remains of the Benedictine nunnery, the parish-church of St. Cyriac, and the 14th-century houses in the village offer promise of an interesting termination to the day's outing. The closing meeting of the Congress is to be held in the evening, but supplementary excursions are arranged for Monday and Tuesday. On the former day Great Chalfield House, Wraxall, and Bradford-on-Avon are to be visited, and on the latter the towns of Marlborough and Mildenhall will be seen, the return by carriage through Savernake Forest. We shall resume our report next week.

THE NEW LAW COURTS.

CONSIDERABLE progress has been made in the main façade of this building. The Strand front begins to assume a more coherent appearance among the maze of scaffolding, and it affords some idea of the completed design. The long stone-fronted façade to the west has also risen to its full elevation in some parts, and the masses of its towers or projections make an imposing effect. More uniformity of features marks this front; the windows are generally narrow lights grouped together, having trefoiled heads, and the chimney-stacks break the long roofing, and display considerable variety of treatment. But it is in Carey-street that the architect seems to have displayed the resources of his fancy to the utmost. The frontage is broken up into large masses, the windows are varied in character, and the gables are enriched with sculptured ornament of spirited design, especially in the spandrels and windows. A remarkable feature in this façade is the gable facing Serle-street, upon the apex of which a statue of Moses has been placed. The great Jewish lawgiver stands upon a pedestal which rises out of the gable; he is shown bareheaded, with the Tables of the Law in his left arm, massively draped. Figures on gable summits are not common in England, and we might fairly question the taste of perching a bareheaded statue, single and exposed, upon a pinnacle overlooking the chimneys and roofs of Lincoln's Inn, were it not that the precincts are consecrated to the law. One of our contemporaries has suggested that the statue would have been less exposed to the weather, and more easily seen, if placed in a niche; but we think that even the latter position would be unsatisfactory.

BATALHA.

BATALHA, though little more than a small village, contains, according to a correspondent of the *Guardian*, the finest group of ecclesiastical buildings in Portugal. There are not many finer groups in Europe. At the first glimpse, the forest of gables and pinnacles and battlements and flying buttresses reminded us of Milan. Their date fills up nearly the whole interval between the years 1388 and 1515. The central building is the church, which was finished in 1416. The nave is very effective from its height and simplicity. There is no triforium; but the pier arches are so lofty (65ft.) as to make the want hardly felt. The choir is short, and ends in an apse. There are small chapels, containing tombs, at the east of each transept. The general effect of the church is not altogether pleasing; and the windows have been filled with miserable coloured glass, arranged in kaleidoscopic patterns. But the deficiencies of the church itself are more than made up for by the beauty of its adjuncts. From the south side of the nave, towards the west end, is the entrance to the chapel of the founder. It forms a square of 66ft., with a central octagonal lantern of 40ft. in diameter. This last is supported by eight splendid columns carrying stilted arches, with capitals of exquisite foliage. The mouldings of the arches are picked out in various colours. The vaulting is very beautiful. Indeed, nothing can well exceed the grace of the design and the perfection of workmanship in this lantern. In the centre of the floor stands the tomb, of great height, surmounted by the figures, larger than life, hand in hand, of Dom João and his Queen. A nobler monument can hardly be found anywhere. The south side of the chapel is occupied by the tombs, also of great beauty, of other members of the Royal Family. The east side has four altars, and the west is taken up with recesses, less elaborately adorned, in which other tombs were probably intended to be placed. This chapel alone is worth taking a journey to see. From the opposite side of the nave the cloisters are entered. The redundance of ornament, and the way in which the architect and the carver have run riot in every form and variety of quaint and elegant device, are marvellous. Much of this, to modern taste, seems overdone. But there are parts, especially the portal leading to the chapter-house, which are in the purest style of Gothic art. The effect of the whole is magnificent in the extreme.

But still more striking is the Unfinished Chapel — the "Capella Imperfeita" — at the extreme end of the church. It occupies a similar position to that of Henry VII.'s Chapel in Westminster Abbey, though the intended communication with the church has never been carried out. It is octagonal, and of noble design and exquisite workmanship. Its western arch excels in elaborate richness anything even in the cloisters. The walls were never carried up farther than the springing of the vaulting. Like Henry VII.'s Chapel, it seems to have been intended for a Royal burial-place. Too much praise cannot be given to the loving care with which the whole building is being restored, by simply replacing worn-out stones and injured details with workmanship hardly less skilled than that of the original buildings.

THE PROPER SIZE OF HOUSE-SEWERS.

A SERIES of observations has been made by Sewer Commissioner Moore, of St. Louis (U.S.A.), to determine the necessary sizes of sewers to carry off house sewage exclusively, irrespective of surface drainage or storm-water. The present sewerage system of St. Louis provides for all the drainage from whatsoever cause; but it has been found expedient, looking towards immediate extension, to arrange certain additions to the system for the purpose of conveying house-drainage alone. A certain neighbourhood was selected, through which Compton Avenue sewer, with a diameter of $7\frac{1}{4}$ft., passes. On this area of 440 acres were 1,370 houses, population 11,000. The observations were taken by constructing a small dam, with a section of 12in. pipe running through it on the bottom of the sewer. All the flow in the sewer was made to pass through the small pipe, and it was found that in the middle of the day when the flow is highest, as a rule, the water was only $6\frac{1}{2}$in. deep in the small pipe. The weather and soil were dry enough to insure that nothing but the waste from the dwellings passed into the sewer. Another sewer was tried, $3\frac{1}{2}$ft. by $4\frac{1}{2}$ft., in a fairly built-up neighbourhood of 155 acres, with the result that a pipe of 9in. in diameter gave a maximum depth of flow of $6\frac{1}{2}$in. and a minimum of $4\frac{5}{8}$in., giving an average of, say, $5\frac{5}{8}$in. While the quantity of the flow shown seems small, it, however, indicates a consumption equal to about 80 gallons of water per day for every man, woman, and child.

A lychgate has been erected at the entrance to the Collegiate Church of St. Peter, Coggeshall, as a memorial of the late Mr. Bonton. It is 15th-century in style, and has been executed in English oak, by Mr. C. H. Oldridge, of Colchester, from the designs and under the superintendence of Mr. E. J. Dampier, architect.

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ILLUSTRATIONS.

COFFEE-PALACE AND WORKMEN'S HALL, KENSAL-GREEN.—LA PORTE GUILLAUME, CHARTRES.—BELL TERRACE SCHOOLS, NEWCASTLE-ON-TYNE.—NEW WORKMEN'S VILLAGE CLUB, WOOBURN-GREEN.—FOUR HOUSES AT STONEYGATE, LEICESTER.—SHOPS AT CARDIFF.—PREMISES IN NEWMAN-STREET, OXFORD-STREET.

OUR LITHOGRAPHIC ILLUSTRATIONS.

COFFEE-PALACE AND WORKMEN'S HALL, KENSAL GREEN.

Until within the last few years two farmhouses alone stood amidst the green pastures south of the Great Western Railway at Kensal Green. Narrow bridges, with gates across them, spanned the railway and the more northernly canal. A road branching from the Harrow-road at Paddington led through quaintly-named cottages to what was then the Great Western gas-works. A couple of footpaths traversed the farms northwards, from Notting-hill to the cemetery. The farms have now been displaced by a vast network of new streets; the fields has been turned into building-sites; the footways have been diverted and converted into wide roads full of bustle and activity; and one of the finest thorougfares in the metropolis, which begins at the main Bayswater-road and passes over the crown of Notting-hill, has been continued northwards to Kensal Green and the Harrow-road. The old narrow bridge over the Great Western Railway has been replaced by a new one of appropriate size and character. The corresponding one over the canal, some 300 yards further north, has been most wisely condemned, and a new iron structure 40ft. wide, designed by Mr. Henry Vignolles, will, in a few months, be begun. The old Plough-lane will be widened, and thus the northern outlet of Kensington parish will be completed. Between these two bridges, opposite the gas-works, at the highest spot in the whole parish and for miles around, a strip of ground, with a frontage of some 200 yards to the main road, has for years remained vacant. The district being one occupied almost entirely by the labouring classes, the idea was started of erecting there a building devoted to the reasonable requirements of their leisure hours, and a series of suitable dwellings for them with all the latest sanitary improvements. The site was purchased for the purpose by a gentleman in the vicinity, and it is now being cleared for the proposed buildings. The Coffee Palace and Hall, shown in our engraving, will be built at the point directly opposite the new bridge over the canal. The arrangement of the plan was governed to a great extent by the peculiar shape of the site and by the difference in the levels—the roadway falling considerably from the front elevation to the rear. The difficulties have, however, been fairly overcome, and, in some cases, utilised. The plans at the bottom of the page explain themselves. The materials used on the fronts will be carved and moulded red brick and stone, with stock-brick wall-face. The roof will be covered with tiles.

LA PORTE GUILLAUME, CHARTRES.

The accompanying sketch entitled, "La Porte Guillaume, Chartres," was made at Chartres last May. La Porte Guillaume is the only one remaining of the city gates of Chartres. The central part is built of heavy stone well laid; the towers are of much lighter work, though considerably thicker, and are plastered. The original moat still remains, though now spanned by a stone arch instead of a drawbridge. It was at this gate that tradition says the Virgin appeared just in time to drive back the forces of the Prince of Condé and *save* the city. A fresco in the cathedral commemorates the event. We are indebted to Mr. Cass Gilbert, architect, of 26, Bedford-place, for the drawing from which our illustration is photo-lithographed.

NEWCASTLE-ON-TYNE.—WESTMORELAND-ROAD OR BELL-TERRACE SCHOOLS.

This group of schools was one of the first erected by the board. It is carried out entirely in stone, with Ashlar dressings and slated roofs. Accommodation is provided for 1,000 children in the manner shown upon the plan. The leading idea of the arrangement was to place the class-rooms in such a manner that complete supervision would be obtained by the head-master, without traversing corridors or leaving the main room. Cap-rooms, teachers' private rooms, and the usual accessories are provided. The cost of the buildings was about £9,600. Messrs. N. and R. Reed were the contractors, and the architect was Mr. Thomas Oliver, of Newcastle-on-Tyne.

NEW WORKMEN'S VILLAGE CLUB, WOOBURN-GREEN.

This building is from the designs of Mr. Arthur Vernon, architect, of High Wycombe. No further particulars have reached us.

FOUR HOUSES, STONEYGATE, LEICESTER.

These houses are now in course of erection by Messrs. Thos. Bland and Sons, for Mr. C. S. Robinson, from the designs of Mr. Isaac Barradale, F.R.I.B.A., Leicester. The whole of the external work is faced with Parry's thin Woodville strawberry-coloured bricks, and the roof is covered with Broseley tiles. There are large kitchens, pantries, and the usual servants' offices in the basement (which, in the lower two houses, is above the ground-line). The ground-floor of each house contains dining-room, drawing-room, and breakfast-room, and a servants' stairs in the two end houses. The first floor: two bedrooms, drawing-room, bath, w.c., &c. The second floor: large balcony, three bedrooms, and dressing-room; and in the attic are two large bedrooms, store closets, and cistern-rooms. A lift is in communication from basement to ground floor.

SHOPS AT CARDIFF.

This block of buildings is now in course of erection for Mr. C. Kyte, on the corner of Bute and Customhouse streets, Cardiff. The site is part of the surplus land belonging to the Corporation of Cardiff through their last Improvement Act, whereby numerous old rookeries were demolished, and a fine new street opened, which will be, in a few years, one of the finest streets in the town. With reference to the materials, the lower part of the shops is to be built of Bath stone and Radyr-stone plinth; the upper part is to be faced with white brick, relieved by red-brick cornices, string-courses, hood-mouldings, &c., from the Pencoed Brick and Tile Works; the bay-windows are constructed of Bath stone, with the exception of cornices, which are brick, and are supported by Aberdeen red granite columns. The contract has been let to Messrs. Jones Brothers, Cardiff, for £2,500. The architect is Mr. John P. Jones, Park-street, Cardiff.

PREMISES IN NEWMAN-STREET, OXFORD-STREET.

The premises Nos. 89a, 90, and 91, Newman-street, have been recently completed for Messrs. F. and C. Osler, glass-manufacturers, of Birmingham and London. The basement and ground-floor will be occupied by them for business purposes, the former, extending to back of vaults, being connected with their present warehouse, and the shop in ground-floor, with an intermediate showroom at back, communicating with their premises in Oxford-street by openings in party-walls fitted with wrought-iron sliding and folding doors. The basement is lighted in front by windows under hall boards, and Messrs. Hayward Bros.' prismatic lights have been fitted over site of area, so as to throw as much light as possible to back of vaults. A portion of lights open on rollers, giving a large and useful space for lowering or raising extra-sized crates. The basement and ground-stories are divided from each other by fireproof floors. The upper part of the building is arranged as dwellings in flats, consisting of drawing-room, dining-room, bedrooms, and bathroom, with usual offices to each, and accommodation for a "porter" is procured by a mezzanine between ground and first stories out of No. 89, of which Messrs. Osler have a lease. The warehouse in basement, the shop on ground floor, and the flats in upper part of the building, are approached by separate entrances from Newman-street. The facing is of red brick, with terra-cotta enrichments between string-courses, and Portland stone dressings. The ground-story is of red Mansfield, the doors and windows are of wainscot, and the whole of windows of ground and upper stories are glazed with plate-glass. Messrs. Wall Bros., of Dale-road, Kentish Town, have carried out the work, at a cost of £7,800, from designs prepared by Messrs. Field and Burnet.

THE "BUILDING NEWS" DESIGNING CLUB.

After a careful examination of the merits of the leading competitors, we have the pleasure of publishing the names of those we think are entitled to receive the three prizes. At the same time, we cannot avoid mentioning the almost equal merit shown in the designs contributed by the two foremost competitors; but as the drawing of "Alfred" has been throughout more careful, we place him first.

1st Prize, £10 10s.—"Alfred" (Arthur Keen, 12, Cathcart Hill, Junction-road, N.)

2nd Prize, £5 5s.—"Edwin" (Edwin G. Hardy, 17, Brunswick-gardens, Kensington, W.)

3rd Prize, £3 3s.—"Sub Silentio" (W. Oliver Mackay, 13, Sommerhill-street, Newcastle-on-Tyne).

The following competitors are highly commended:—

"Sub Rosa" (Albert Howell, 8, Upper Bedford-place, Russell-square).

"Binny" (Frank Bindloss, The Midlands, Cheadle Hulme, Cheshire).

"Honey Dew" (Herbert W. Railton, St. Alban's View, Blackburn, Lancashire).

"Jack" (J. Holdgate, Lower Clapton).

"Pupil J." (J. B. Hikens, Norwood, near Liverpool).

"No. 90" (Arthur Turner, St. Stephen's, Norwich).

We also mention the names of six other competitors whose persistent endeavours and steady improvement call for praise.

"Ap Adam" (A. West Mabson, Elliott-road, Crooks Moor, Sheffield).

"Castello" (F. H. Mullis, Manor House, Far Colton, Northampton).

"Motto J. L." (J. Lord, jun., Alma-place, Brighouse).

"Clansman" (W. D. Amos, Newcastle-on-Tyne).

"Fleur de Lis" (W. Martin, Venice Villa, Ilfracombe, N. Devon.)

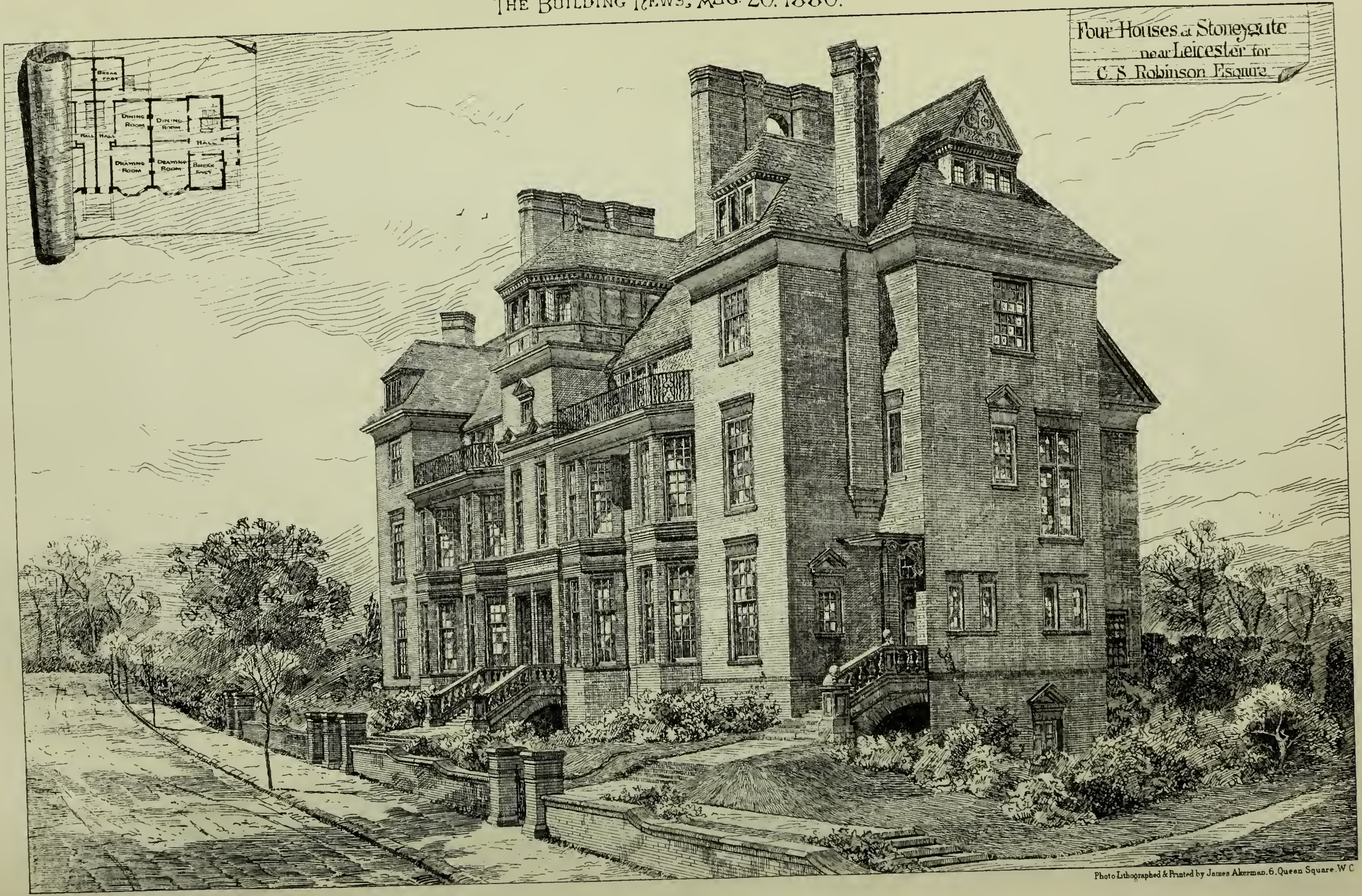
"Burswell" (G. S. French, Sidney-street, North Shields).

CHIPS.

The iron shutters at Child's Bank, Temple Bar, have been supplied by Messrs. Salmon, Barnes, and Co., of Ulverston; the shutters have been made of their best quality curvilinear iron, worked by patent balance-weight motion, and adapted for raising and lowering from the inside. The same firm are the contractors for the shutters for the shops and stalls of the Dublin South City Markets.

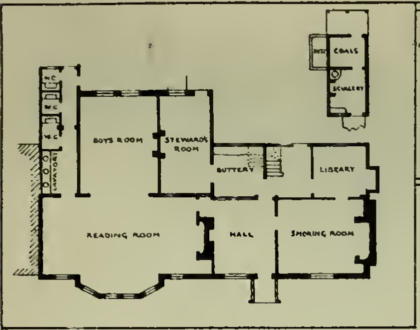
A new Episcopal church is being erected at Dundee. The plans have been prepared by Mr. Alex. Ross, architect, Inverness, and the cost is estimated at £2,500. The church, which will provide accommodation for between 250 and 300 persons, is in the Early Gothic style, with a circular tower 75ft. high.

A presbytery and sacristy is to be built at South Bank, near Middlesbrough, for the Rev. Thomas Holland. New schools, to accommodate 250 children, will subsequently follow. Martin Carr, of Sheffield, is the architect.



Four Houses at Stoneygate
near Leicester for
C. S. Robinson Esquire

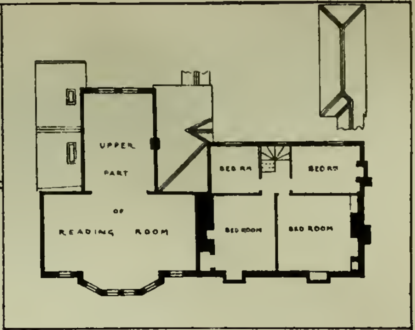
Photo Lithographed & Printed by James Akerman. 6. Queen Square. W C



* New · Workmens · Village · Clvb *

Woobvrn · Green · Bvcks

Erected · by · the · late · Alfred · Gilbey · Esqre · J · P · *Arthur Vernon, Architect ·*



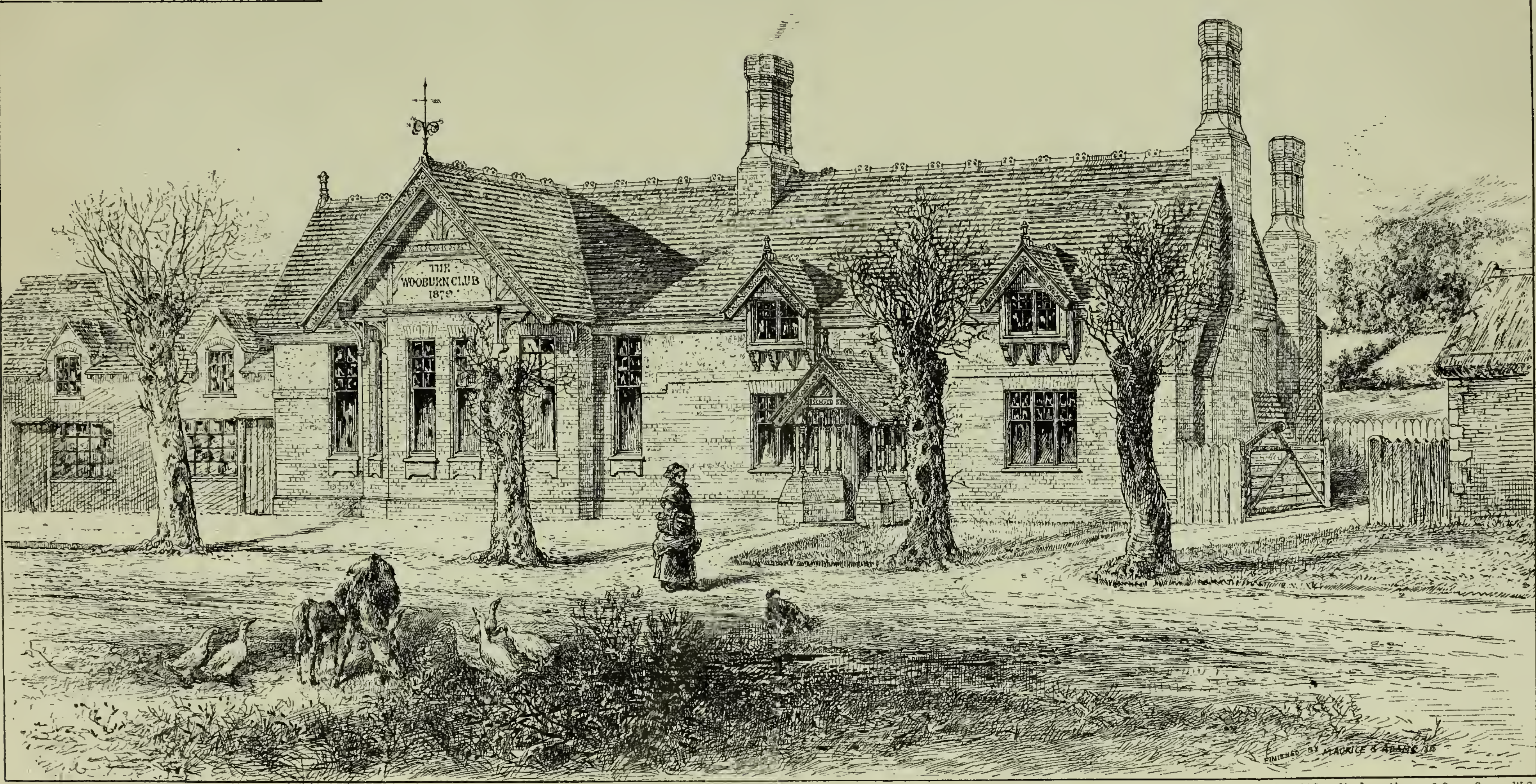
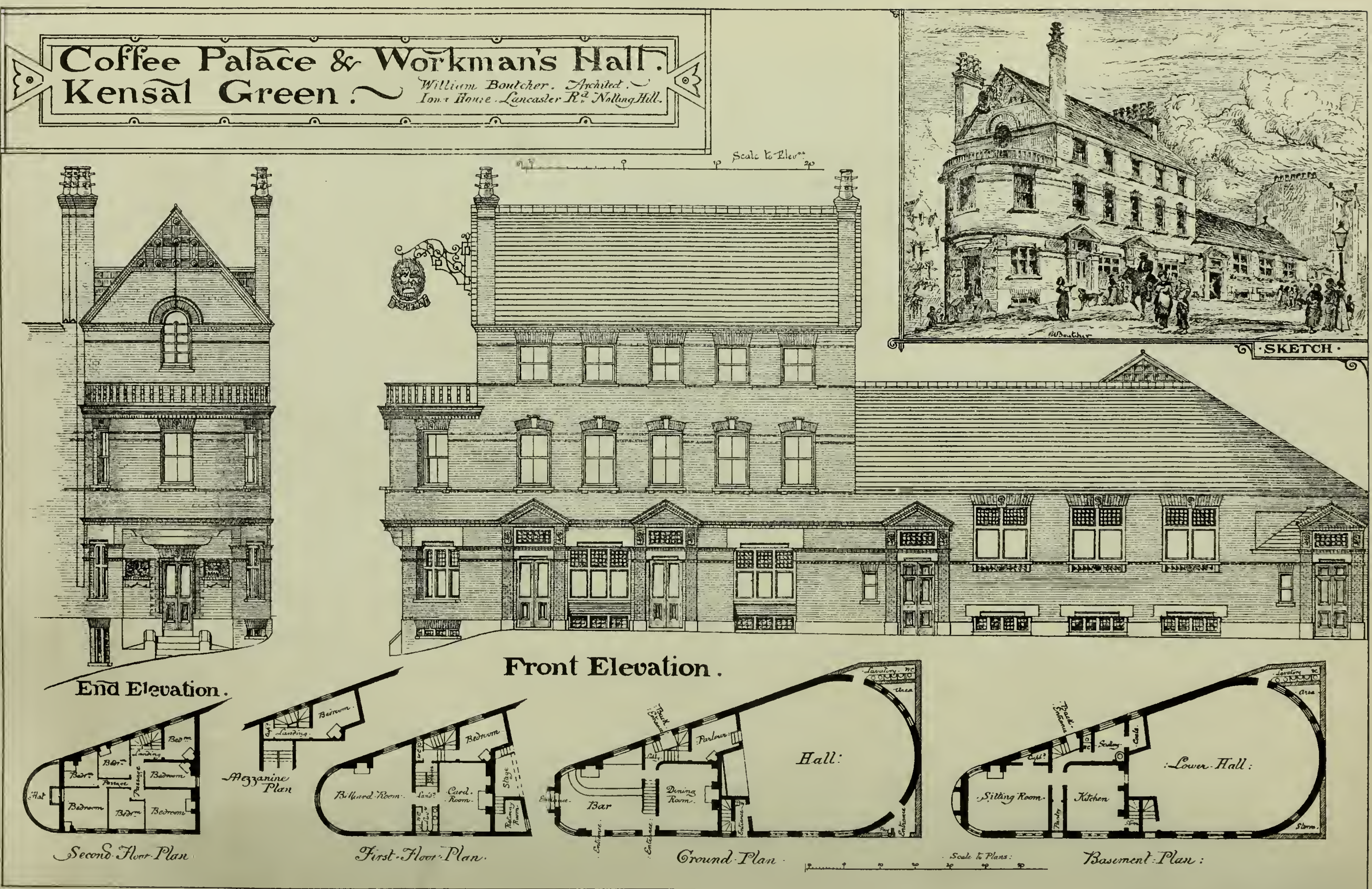

THE WOOBURN CLUB 1879
FINISHED BY MAURICE B. ADAMS

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

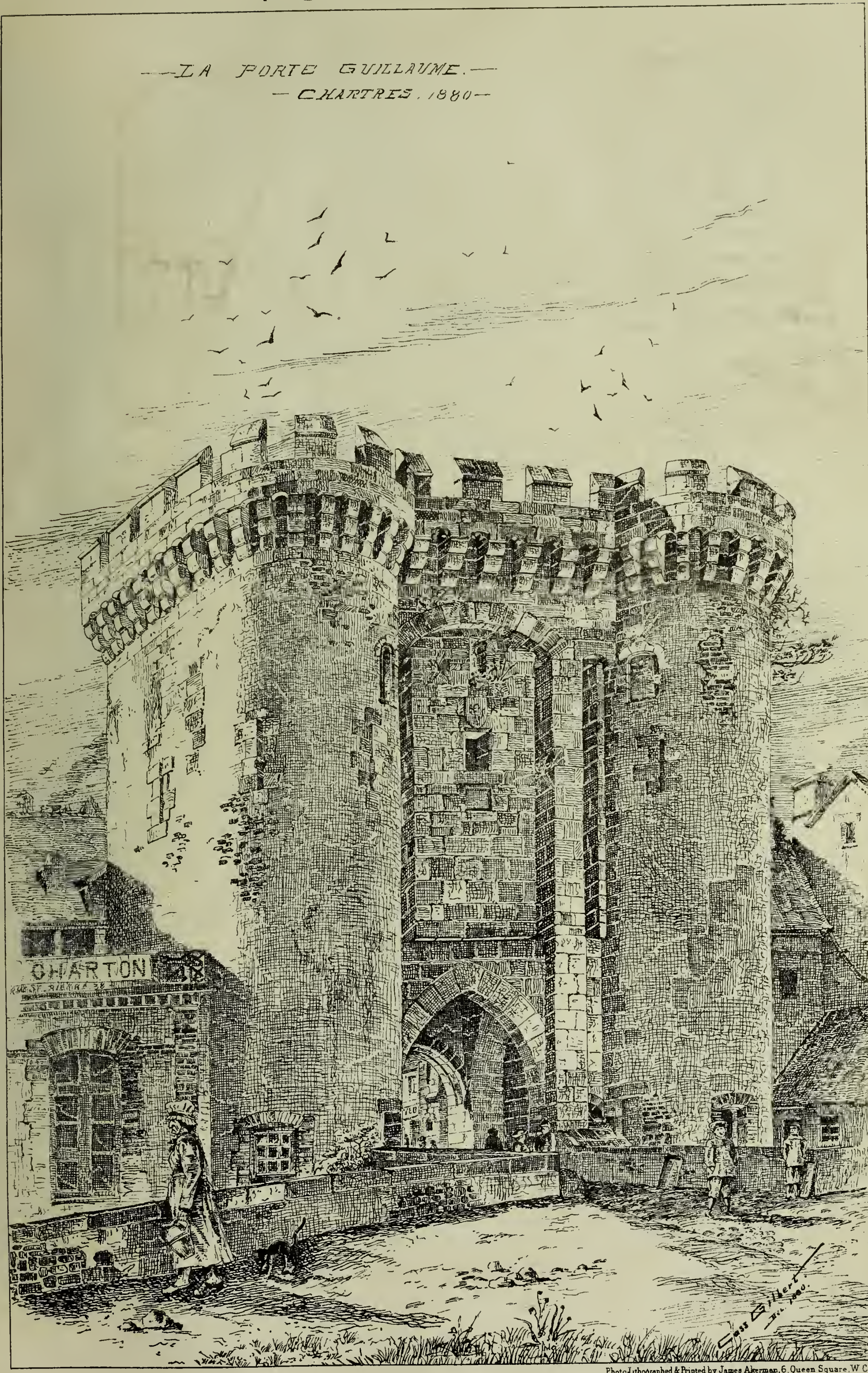
Coffee Palace & Workman's Hall. Kensal Green.

William Boutcher. Architect.
Iona House. Lancaster Rd. Notting Hill.



Jn. M. Hay del.

Photo Lithographed & Printed by James Akerman. 6. Queen Square. W C



—LA PORTE GUILLAUME.—
—CHARTRES, 1880—

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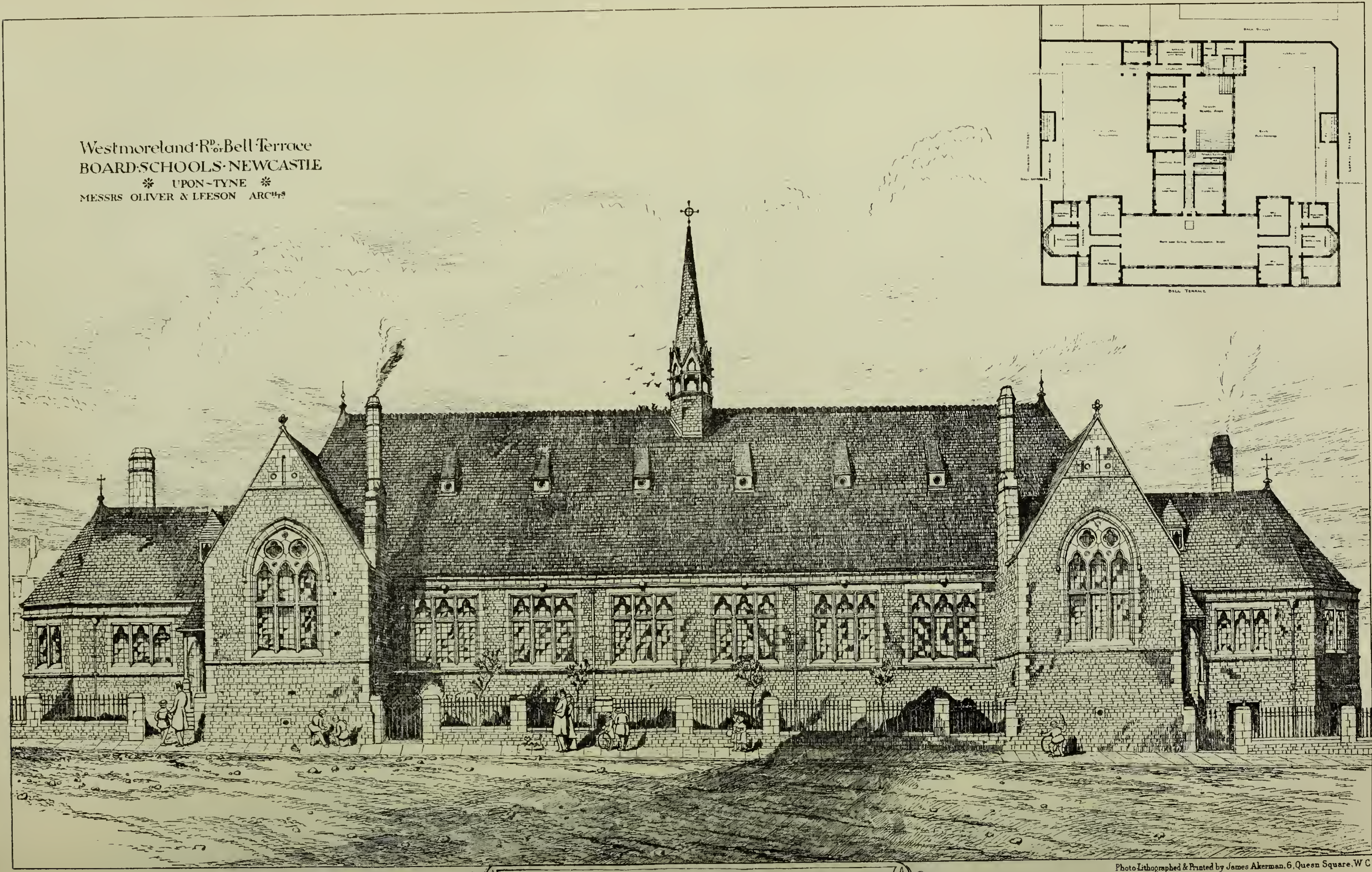

Westmoreland·Rd. or Bell·Terrace
BOARD·SCHOOLS·NEWCASTLE
❊ UPON-TYNE ❊
MESSRS OLIVER & LEESON ARCHts

BELL · TERRACE · SCHOOLS

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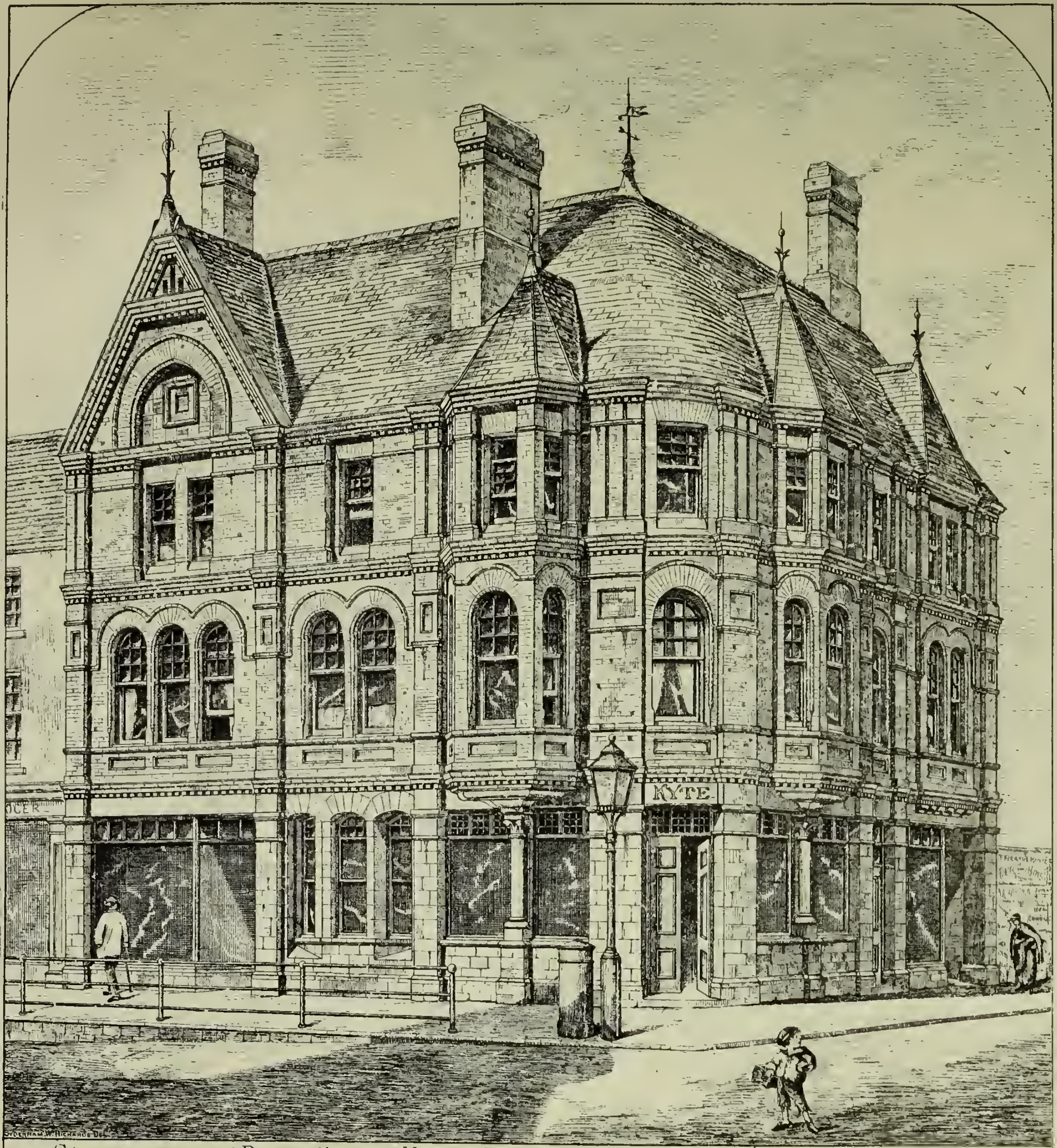
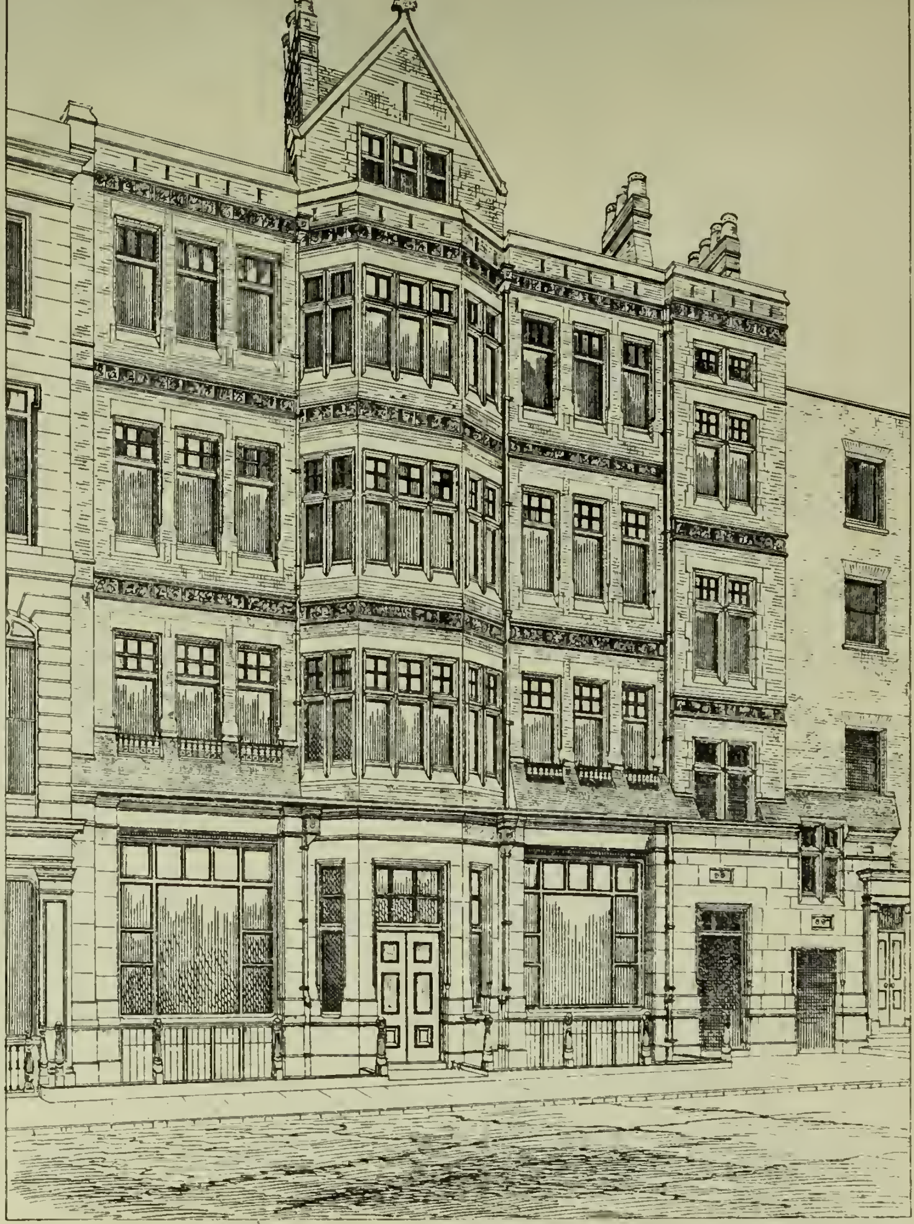


Shops, corner of Bute & Custom House Streets Cardiff, for Mr C. Kyte. John P. Jones. Archt.

PREMISES NEWMAN St OXFORD St
FIELD & BURNET ARCHITECTS



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PUBLIC WORKS IN SPAIN.

THAT the public works of Spain should be insufficient, and badly regulated, seems to be a matter of course. With this people, whose deficiency in administrative ability makes their great country an unwieldy, disunited group of provinces; whose want of probity makes constitutional government a farce; and whose energy-lacking character looks upon civilisation principally as so much more of luxury for those who have, or can get, money to purchase it—this state of things is only what is to be expected. Except in those localities where foreign intercourse, or a more progressive race than the average, prevails; public works tardily follow the demands of the country, rather than lead or develop its resources. There is movement—progress, I suppose it may be called—but it is a progress reluctantly yielding to the compulsion of the civilisation of more energetic nations. Still it is not fair to judge Spain simply by comparison with other more highly civilised countries of Western Europe. She is not capable of the same development as are our own and some other favoured lands. The extreme climates—the enervating summers and tempestuous winters—the barrenness of the flood-washed sand and rock soils, and the intractable mountainous character of a large portion of the surface in certain districts—render their being brought into a condition such as England or Belgium enjoys out of the question. It is not just, then, to estimate Spain's capability of supporting a population, or her proper proportion of roads and railways, by computation of her thousands of square miles, with such standards as these.

The roads, for example, are, from this point of view, very inadequate; yet, for the population and the purposes it has to serve, the system is tolerably good. I think the high roads are now, especially if the condition of other things be considered, very satisfactory. They are fairly well engineered; with, generally, good working gradients. The embankments, cuttings, bridges, and occasional tunnels, are kept in good order by a regular permanent staff of workmen, and the macadam surface of broken limestone or granite is also well kept. The "diligencias," which are not themselves models of utility or good management, have little to complain of as to their roads. Most of these vehicles now ply as feeders to the railways, in correspondence with the trains; with consequently a greater regard for punctuality than formerly. In some cases, too, the new lines of railway are commenced from both ends at once, and portions are opened as they are completed; with a connecting service of "diligencias," gradually shortening, and finally disappearing altogether. It is not long since the route to Granada was traversed thus; and, at present, the traffic from Oviedo to Leon, and from Leon westward to Lugo, has to use the same broken means of transport.

As new, or even growing cities, are in the interior rarities, nearly all the highway system is ancient. I did not see or hear of any altogether new high road; but improvement works are to be seen here and there. The approaches to some towns, upon the elevated sites favoured by their founders, the Moors, which are subjects requiring some consideration, have been or are being improved. These ascents are sometimes so great as to involve zig-zags and detours of as much as a mile in length. Of course the improvements are such in a utilitarian, but not, by any means, in the picturesque sense. At Toledo, the new road from the station, after crossing the river by the old bridge "Alcantara" and making a circuit of the eastern end of the town, makes a zigzag (always rising) towards the Puerta del Sol. But it runs past this structure and alongside the fragment of the old road, instead of through it. And, artistically speaking, the grand old gate seems insulted by the disregard for its purpose. At Segovia similar works upon the principal approach were executed some time back. And at Zamora, Toro, and other elevated towns, a reform in the entrance roads has been attendant upon the increased traffic, brought by the railway. At Avila the road from the direction of Segovia which passes under the walls of the town to the bridge, is now being reconstructed at different levels and gradients; and although there are no cuttings of any great depth, yet the granite rock which crops up through the thin soil necessitates a great deal of labour in wedging, blasting, &c.

I may note here the awakening to the usefulness of trees, which is evident in some places. Spain is sadly deficient, generally speaking, in this respect; partly, perhaps, because some sort of irrigation is almost always necessary. But one can see now in many situations near the large towns, lately-planted trees, which promise to greatly improve the parched dusty roads—notably, for numbers, near Burgos, where upon the waste lands, bordering on the river (which like most Spanish streams, shows a greed for space out of all proportion to its volume), there are some splendid "alamedas" or groves which have been quite lately extended. These trees are principally varieties of the poplar species. But, in many localities, the elm flourishes well if supplied with water.

Some other important works, now in progress, are the improvement of the internal thoroughfares of all cities. In those few which are progressive, there are one or more new broad streets, either intersecting the denser neighbourhoods or extending the town toward a suburb. Some of these streets I mentioned in connection with House-building. But I reserved the notice I wish to make of the extension of Barcelona, as belonging rather to the series of public works than to simple house-building.

Barcelona, the capital of Catalonia (called by Ford the Lancashire of Spain), overlooks the Mediterranean toward the east. It is extending with London-like rapidity over its valley, toward the hills, on the south and west sides. In the south, under the hill and fortress, which command the town, is arising a new bourgeoise quarter with wide rectangularly-planned streets and lofty houses. To the south-west, along the path of the Spanish railway, is a busy suburb of trade and manufactures. Westward, at a distance of a mile or more from the former boundary of the town, lies the suburban town of Gracia, at the base, and on the lower slopes of breezy hills, upon which villas are arising in all directions. Gracia is now connected with Barcelona by a fine avenue "El Paseo de Gracia," and as this is a good representative of the modern Spanish favourite type of principal thoroughfare, I will describe it in detail.

It has first a broad central footwalk—the scene of the all-popular evening promenade—fully 50ft. wide; then on each side a good carriage roadway (which, in this instance, has the tramway along its inner edge), and beyond are the usual footways, also liberally wide. Each of these divisions is lined with rows of trees, and sometimes, as at Zaragoza, evergreen hedges are added. The effect is very agreeable. Of course, the amount of land necessary is rather extravagant, and where (as is generally the case in England) there is much cross traffic, the central footway would be too much intersected by crossings. But, for Spanish conditions, it is very suitable and good. It affords a curious contrast between the ancient and modern methods of resisting the heat of the climate. In this, foliage replaces the sheltering cornices and closely opposed walls by which the Moors and their contemporaries sought the necessary shade. And the airiness is, of course, much more salubrious. The "Rambla"—the older main thoroughfare of Barcelona—is also adorned with noticeable trees. They are splendid lofty planes, untrained and unlopped, except so far as is necessary for their proper care; and they show, I think, to great advantage over the conventional cones of foliage which are generally considered proper for town streets. A great number of the frontages on the "Paseo de Gracia" are already filled, and the remainder seem to be going fairly well.

The by-roads of Spain are simply as bad as they can be; sometimes spread over a hundred feet of ground, by the attempts of drivers to escape the mud or dust, and at others sunk deep in a cutting, formed by the repeated churnings of wheels and washings of trespassing rivulets. It is very true in Spain, the national proverb which says, "There is no short cut without labour."

The railways also are bad. One cannot even grant them the moderate approval which the high roads may claim. The country is often very difficult, calling for all the engineer's skill and ingenuity, and, as usual, in mountainous districts steep gradients, sharp curves, and long detours are necessary. Cuttings, even shallow ones, involve a large amount of blasting in the hardest rocks—granite, limestones, &c., or, in treacherous soft sands, careful provision has to be made for the escape or diversion of the surface water. Embankments generally necessitate provisions of more magnitude than we are familiar with, for the stream in the traversed valley, which, although in summer almost a dry gravel-bed, is probably a powerful flood in winter and spring.

But, on the other hand, many of the Spanish railways traverse a country flat as the sea. In either circumstances, the ways and accessories are in bad condition. With very few and small exceptions, they are single lines with loops at stations. Some few railways, however, have been constructed with tunnels, embankments, &c., of the necessary width for the second line of rails. The metals used are flat bottom flanged, probably to avoid the detail labour consequent upon the use of chairs, &c. Sometimes even the hollow rail of ∩ section is used. And the road is worn and neglected till it attains almost its last stage of even comparative safety. Fortunately the maximum rate of speed is low. The stations, too, which are inconvenient and dirty, are placed at considerable distances from their towns. This appears to be, sometimes, merely an extraordinary freak, or a concession to the coach-owners. Certainly it is intentional, for it is invariable, and often one passes the town quite near, and then has to return in one of the wretched little omnibuses from the distant station. There may be some better motive, the expected growth of the town, or some such unapparent reason. I hope so.

The rolling stock is also badly maintained, and often badly constructed. The engines are mostly of English or French make, and, I suppose, are good enough, but are neglected. The carriages are nearly equal to the most inferior of English lines. Occasionally, of course, better specimens than this low average are met with.

The construction of new railways is, at present, I understand, principally carried on with French capital. Some of the latest sections opened are the following:—Bobadilla to Granada, Seville to Bobadilla (completing a direct route from Seville to Granada), Madrid to Talavera, and Lerida to Tarragona. Among the most important lines in progress are—from Vigo to Lugo and La Coruna; from Leon to Orense, meeting the last-named line; from Oviedo to Leon; Aranjuez to Cuenca, Seville to Huelva, and Seville to Badajoz. Parts of some of these lines are already finished and working, as before described, with connecting services of "diligencias."

There are also projects, shortly to be realised, of lines—from the present Cadiz line to the neighbourhood of Gibraltar, from Badajoz to Malpartida, from Vilalba (on the Madrid line) to Segovia, and a long line from Zaragoza south-westward, parallel with the coast. A glance at the map will show that until these are complete the railways of Spain can hardly be called a system; and even then many large towns will only be indirectly connected by routes involving considerable detours.

Bridges are, in this country, frequent necessities. And the powerful action of nature and time enforce a certain standard of solidity and thoroughness. The greater number of the larger towns have their ancient bridges dating from the Mediæval or even the Roman epoch; well constructed originally, and fairly well cared for now. Leon, Salamanca, Zamora, Toro, Valladolid, Avila, Toledo, Zaragoza, and Cordova have each one or more interesting old bridges over their respective rivers; most of them highly picturesque structures, with a fantastic variety of arches and piers and gate-houses—the result of many successive damages and repairs or partial reconstruction. That at Toro shows, too, a curious example of some of the difficulties to be contended with, in the erection and maintenance of such works. The bridge, which originally was, of course, about at right-angles with the direction of the stream, now appears, from some points, to run parallel with it. The river has gradually changed its bed by encroaching upon the soft soil of the left bank, necessitating the addition of more arches to the bridge; and then, again, an embankment wall, of considerable length, to protect the road, and prevent the floods from severing the communication with the bank. And as the works are done very sparingly (it is not a rich community) the question is not decided, but only delayed. The river still persists, at certain times, in crossing over the road, instead of under the bridge.

The new bridges, occasionally seen, are of similar character to those prevalent in the south of France; rounded piers with segmental arches —more useful than beautiful. But they are far better than the light straight ugly lattice girders, which have been used at Lerida to replace part of the stone bridge recently destroyed. Two foot-bridges of similar inartistic iron construction have been thrown across the picturesque house-lined river at Gerona, sadly disfiguring the view of the stream. There are, about the country, a few examples of the cast-iron arch construction, which have a somewhat less offensive appearance. Not unfrequent in some less populated districts, are light suspension bridges of wire, rope, and timber, which have the advantages of cheapness, both of material and construction; and are sufficient for their purpose.

In Madrid, a miniature Holborn Valley, near the royal palace, has lately been provided with its iron viaduct, which is not, however, a work of any great magnitude.

In noticing railway bridges, I must first mention a smaller construction than what is usually termed a bridge. These are the lesser works for the occasional floods which sweep over certain plains—shallow broad sheets of water, of insignificant power perhaps, unopposed; but capable of great destruction, if accumulated against such a dam as a railway embankment. Little height is necessary. The railway, elevated a few feet above the plain, is carried over a series of transverse stone piers, somewhat close together, with girders, or rather sleepers, to receive the metals. There is generally no floor. The bridges proper, by which the lines cross the large rivers, are nearly all the most simple and similar lattice girders of rectangular outline (with the rails at the level of the bottom flanges), often of considerable span, and frequently required to be much longer than the ordinary breadth of the stream, so as to accommodate exceptional states of the water. I must confess I was surprised at the lightness, almost, one might say, flimsiness, of these structures, as compared with their spans and loads, and our usual notions of the relationship of these data. I have had an opportunity of learning that this economy is arranged by working out the usual formulæ with an unusually high coefficient of strength of the material. Notwithstanding this, the material itself is of inferior quality, principally, I believe, Belgian. It is probable, however, that (as I noticed of timber-work in house-building) the fitting and jointing are carefully attended to, and thus the principal source of weakness, for which exorbitant "margins of safety" are usually allowed, may be to some extent curtailed. Indeed, it seems to me a question whether the generally prevalent extravagant allowance for defects is not over-reaching itself in becoming a direct encouragement to carelessness. I do not advocate exactly what I see here, the motive of which is undoubtely economy; but still, that object is attained, and the trains pass and repass safely and regularly enough; possibly more so, than if the engineers had known they had a big "margin for safety" to trifle with.

The piers to these bridges are of iron or stone, according to circumstances. If the former, the same economy of course rules their proportions.

I saw, in travelling in mountainous districts, several examples, deserving, I think, more attentive examination than the superficial one I was able to bestow upon them. The portions of lines between Burgos and Zaragoza (by Logroño) between Madrid and Avila, Alcazar and Cordova, and between Granada and Bobadilla, I remember as being particularly interesting for their difficult engineering problems and solutions. At Madrid and at Barcelona there are several lines of tramways through the main thoroughfares. They are worked with English cars, and probably owe more than this to English assistance.

Those at Barcelona are laid with a rather surprising disregard for the convenience of the non-travelling public. The lines in some cases pass along narrow streets, where there is but about 2ft. breadth of footway, and so close to the kerb, that shop-sunblinds, signboads, &c., are almost suppressed, and foot-passengers and inhabitants have to take refuge in doorways as the cars pass. This is more than inconvenient—it is dangerous. But it does not appear to be here considered the particularly selfish infringement of public rights which it undoubtedly would be in England. A section of the local press, which protests against the whole system, probably goes too much to that extreme to gain any important influence, as the tram-cars are favourite means of transport. The lines are allowed to get into a very bad state of repair, too, but the vehicular traffic is not representative of so strong an interest as to make effectual protest against that evil.

Upon a line which runs out four or five miles northward to the suburbs in that direction, the service is worked by steam-engines, which are of English make (Merryweather's, if I remember rightly). They draw trains of three cars each, upon lines laid at the edges of the road. These also are in bad order, and the high rate of speed used along the less-frequented sections of the road will probably, before long, end in an accident, and perhaps the condemnation of the whole system, when only the manner of working it is to blame. I travelled by this line, and watched the effect of the engine and cars upon the few horses we passed. I was pleased to be able to observe that only slight notice was accorded by them. It is likely that these animals had encountered the thing before, and no doubt many horses which will be alarmed at the first appearance of such a machine, will be reconciled to it more speedily than some of their masters. It appears strange that a distant and less busy land should be enjoying the benefits of our advanced science while we at home are so fettered by laws and restrained by prejudices that even a trial of sufficient duration to be fair is impossible.

In harbour works the maritime towns show a desire to keep pace with the times; but I have, unfortunately, little information upon this subject. Barcelona is improving her accommodation for shipping by constructing an inner harbour, and Cadiz and Seville have a certain amount of such work in hand. But some of the other busy seaports did not come within my range.

I do not know of any late addition to the few canals of Spain. The same circumstances which I have described as making railway operations difficult have, of course, even more force against canals. The present canals, which I occasionally met with here and there, appeared to be as deserted of boats as are the rivers. But probably, later in the year, when the harvests and vintages have been got in, there is more occasion for their use. There can be no doubt that an extension of the canal system in the plains would be highly beneficial, if only for purposes of irrigation.

The rivers are distressingly neglected as far as navigation is concerned. Some of the larger ones, which are permanently well filled, are for many miles capable of being rendered navigable with only a moderate expenditure of capital and labour. Indeed, the question has long ago been discussed, and this fact admitted. And yet they are left to the dams and mills, with hardly a ferry-boat upon the broad highways which ought to be arteries of commerce.

The ingenious, if not skilful, schemes of irrigation which prevail everywhere in this land of drought, deserve mention. The long sinuous channels and rough yet carefully-regulated dams of stones and mud have a certain set of principles and methods, the result of years of experience, which make their construction a little science. And the treatment of slopes and other difficult surfaces so as to render them amenable to this control, belongs to the same subject. But a detailed description is perhaps beyond the province of this paper.

The water supply to towns still leaves much improvement to be desired. The source is generally the river, and only in one or two instances is the filtration even tolerably effective. So that, although Spaniards drink a great deal of water, pure, or rather untempered, yet a glass of really good water is, in the lesser towns, a treat only occasionally enjoyed, and more often the stranger drinks with dubious anticipation of the effects of the unaccustomed solution. The supply to the public fountains is fairly abundant in ordinary times, and the irksomeness of the necessary carriage is not felt as a hardship where nothing more convenient has ever been known. In seasons of drought, however, there is sometimes serious suffering arising from the scarcity or badness of water.

The lighting of towns is fairly well done; allowance being made for the absence of gas, which only the capital and a few other favoured cities can boast. The lamps are fed with petroleum, and I notice an extensive and growing appreciation of this fluid for domestic as well as public purposes.

The police administration is related to rather than connected with these subjects; but I must note the interesting fact that every town (except I think, Madrid) has still its ancient service of watchmen, who patrol the streets, armed with spear and lantern, and chant the time o'night and the state of the weather, embellishing the cry sometimes with a pious ejaculation. There is something charmingly out of date about all this.

Of buildings which deserve to rank as public works, there are, I fear, but few examples of late erection to be enumerated. The national pastime, bull-fighting, despite all the talking of its discouragement has yet vitality enough to demand and obtain substantial new theatres. These are highly interesting structures, partly on account of the many points in which they resemble the ancient Roman amphitheatre. The new "Plaza de Toros," at Madrid, is a vast open amphitheatre of granite steps, encircling the arena and its ring passage-way, and surmounted by the two-storied covered structure which contains the higher class of seats, and under which are the passages and corridors. The inclosing wall is in a kind of modernised Moresque style.

There are, in different towns, a few administrative buildings and theatres, barracks, &c., of no particular note. The exterior of a new theatre in the "Paseo de Gracia" before mentioned (Teatro Español), deserves note for its good adaptation of Moresque architecture to modern street purposes. It has a façade in two blocks of similar and symmetrical design, with the entrance gateway and passage between them. The detail is generally very agreeable, although not quite pure. The interior of the theatre itself is not particularly good or novel.

Of churches, ancient towns have inherited a sufficiency for the wants of to-day; for where progress and increase of population are active, heresy and scepticism are also rife in a more than proportionate degree—so that often fewer rather than more churches are required. Barcelona, with its 300,000 souls, has not so many churches as some old towns of 10,000.

Schools, museums, and hospitals are generally accommodated in ancient buildings, either built for those purposes, or afterwards appropriated to them. In these departments of civilisation there are not many signs of activity, although there is a knowledge extending that something more is wanted.

In submitting these traveller's notes to the readers of the Building News, I must make some apology for their shortcomings. I do not pretend that they are exhaustive. There are several important cities of Spain of which I saw nothing. And they are perhaps not altogether free from occasional error, as those things which I have noticed I have to write of inconveniently, and without even a guide-book to represent the literary aids which one generally has at command. Perhaps these circumstances may be urged against the criticism I should otherwise deserve.

R. W. Gibson.

BUILDERS AND QUANTITIES.

LAST week we published a valuable paper on "Bills of Quantities, and Measuring Builders' Work," read by Mr. Edward Hughes at a meeting of the National Association of Master Builders of Great Britain, at Bristol (page 179). It is the more valuable as representing the builders' view of the question of quantities, as the subject has, hitherto, been chiefly discussed by architects and surveyors. We may as well rather pointedly say that the profession have rather avoided the builders' view of the subject, and we see that Mr. Hughes has very clearly stated the latter, namely, that the Bill of Quantities is issued, as a rule, "by the agent of the proprietor, and is neither more nor less than a written statement on *his* behalf." Mr. Hughes' experience of the surveyor's fees for taking quantities, namely 1½ per cent., with a fee for copying, fairly gives the average cost—we have often known it greater—of supplying quantities to the competing builders. It is not generally true, however, that each unsuccessful builder is called upon to spend, in cash, a surveyor's fee, in consideration of his having had one chance out of six to obtain the contract; for, in most cases, the builders obtain a surveyor's quantities, and it is agreed that the successful competitor pays the commission. Nor is it always true that builders refuse to compete unless quantities are delivered to them free of expense; in provincial practice, they more frequently desire quantities to be prepared by the architect, or his surveyor. Mr. Hughes also says:—"Builders make no charge for their time estimating, money spent in visiting the site, which, in itself, is frequently a considerable sum." But, we take it that every one who desires to compete cannot fairly object to give his own time, and we might instance the greater cost incurred by architects in entering the lists of competition, in which not only their time and labour, but several months assistants' labour, have to be bestowed fruitlessly. In alluding to the question, Who prepares the bill of quantities? Mr. Hughes adopts the only right line of argument, and one which we have invariably maintained, namely, that the architect is not the proper person to prepare his own quantities. Several good reasons are given for this, the last of which is sufficient in the mind of any one having a keen sense of his position and independence; and this reason is that in the event of error being found in the quantities, it is most difficult for the architect to hold the balance fairly and equitably between himself and the builder on the one hand, and between the builder and owner on the other; however honest his intention may be, "he cannot avoid being biassed in a measure against the builder in the proprietor's favour."

We desire particularly to call the attention of our professional readers to the remarkable divergence or range in the charges for quantities which Mr. Hughes specifices, but which is by no means exaggerated. According to him, he has paid $\frac{3}{4}$, 1, $1\frac{1}{4}$, $1\frac{1}{2}$, $1\frac{3}{4}$, 2, $2\frac{1}{4}$, and $2\frac{1}{2}$ per cent. variations, not in consequence of the degree of complexity or trouble in the work, but due to caprice of the measurer.

In London the leading surveyors of this class charge seldom more than $1\frac{1}{2}$ to 2 per cent., but in the country the rates are far from being so uniform as they should be. It is perhaps only right to say that in small complicated buildings and alterations, a higher percentage may fairly be claimed than for large buildings, where a great mass of brickwork and rougher work only is required; but we think it time something should be done to make a code of prices for the measuring surveyor, and the Institution of Surveyors is the right body to institute such a code. With respect to responsibility for accuracy of quantities, the author thinks that it is to the best interests of proprietor, architect, and builder, that in every building contract the bill of quantities should be prepared by a properly qualified surveyor, at the expense of the proprietor, and guaranteed by him. No one will dispute the justice of this proposition; but, unfortunately, as everyone knows, the quantities are often taken out unknown to the proprietor, and does not form an element in the contract as they should do. A practical part of Mr. Hughes' paper dwells on the mode of measuring and valuing, to which we particularly refer our readers. He strongly urges the value of *dissecting* and dividing into separate items, work involving labour, by making the first item of any branch represent the simplest form, adding, item by item, any increased value in labour or materials. Our experience of quantity-taking has shown us that a good system of measuring centering is everything, and that a good deal of labour may be omitted by not taking into account the extra-labour items as they occur. The author illustrates these remarks by referring to the quantities usually inserted for excavation where so many cube yards excavating and wheeling are mentioned, but without stating the depth of trenches, &c., or the distance to wheel.

In describing brickwork, greater omissions of labour occur; the quantity, so many rods, is inserted, and the price is to include cutting, ornamental moulded courses, cornices, gauged arches, &c., as shown in drawings; but the builder is at a loss to know what is intended by such a general phrase, or, for instance, the following phrase: "including all labour of every description." In joinery, as it is easy to show, imperfect description may give rise to estimates varying from 25 to 200 per cent., and the instances mentioned are by no means uncommon. In the absence of dimensions or quality of furniture, number of doors or windows, it is impossible to estimate correctly from a lump sum of superficial feet. The word "best," so commonly used in quantities, in describing locks or other fittings, is a very misleading term, and as we are told, may mean anything from 7s. 6d. to 75s. But we need not enter into other details, such as the phrase "including painting," in the joiner's work, and the ambiguous meaning conveyed in the terms "feet run," "fixed"; all that we need remind builders is to look at drawings when they can, before pricing out, though this course is not often practicable. The other instances speak for themselves. We need only add that the remedies proposed by the author are reasonable: first, for builders to reject quantities that are not properly prepared; second, to insist on their being made the basis of the contract; and third, that all surveyors practising in this capacity should have some license or diploma.

DRAINAGE OF WORKHOUSES.

The Local Government Board have had under their consideration the reports made from time to time by their inspectors regarding the system of drainage in operation at various workhouses, and other poor-law institutions, and it is evident to them that in many instances the arrangements in this respect are not as satisfactory as could be desired.

The Board find that, while in many cases the drainage is conveyed direct into the public sewers, there are numerous examples in which it is collected in cesspools, and, moreover, that the contents of these cesspools are frequently allowed to escape either by soakage into the ground, or by overflowing and discharging into a ditch, or a pond, or a stream.

In reference to arrangements of this character the Board deem it right to point out that, if existing in an urban sanitary district, they would be in contravention of the 47th section of the Public Health Act, 1875, which enacts that:—

> "Any person who in any urban district . .
> (3) Allows the contents of any watercloset, privy, or cesspool to overflow or soak therefrom, shall for every such offence, be liable to a penalty not exceeding 40s., and to a further penalty not exceeding 5s. for every day during which the offence is committed."

Although this enactment relates only to such cesspools as are within an *urban* sanitary district, it would, nevertheless, be very desirable, for sanitary reasons, that, even when the workhouse is situated in a *rural* sanitary district, every effort should be made so to deal with the sewage that it shall not pollute the soil in a manner that would be illegal in an urban sanitary district. Moreover, the flowing of sewage into streams and watercourses is prohibited in rural as well as in urban districts by the Rivers Pollution Prevention Act, 1876.

In view of the considerations above referred to, the Board think it may be of use to point out a few general principles to be observed in regard to the disposal of sewage from workhouse buildings.

They first observe that cesspools should never be allowed to exist if sewers are within an accessible distance.

The 21st section of the Public Health Act, 1875, authorises the owner or occupier of any premises to drain such premises into the sewers of the district, and the 23rd section gives power to the sanitary authority of any district to require the owner or occupier of any premises which are without a drain sufficient for effectual drainage to make a suitable drain and connect it with the public sewer, provided such sewer be not more than 100 feet distant from the site of the premises.

If cesspools are rendered necessary by the absence of other proper outfall for drains, it is most important that they should be made absolutely water-tight, and be so situated as to be out of the line of the natural drainage of the locality, and as not to endanger the wells, or other sources of water supply. They should also be so far distant from buildings as to be incapable of becoming a nuisance to the inmates. Moreover, they should be so placed as to allow of their contents being periodically removed and applied, where practicable, to land under cultivation.

If there are no sewers available, and the circumstances of the locality will permit, it may be possible to dispense with cesspools altogether, and to deal with solid excrement on some dry system, and apply the slop drainage direct to land by way of irrigation. Care, however, must be taken that the land to be irrigated is of adequate size, and possesses the requisite fall, and is itself capable of being drained; and whenever the dry earth, pail, or ash system for excrement removal is used, it is indispensable that a regular system of superintendence and removal should be organised and rigidly carried out.

Where drains are connected either with public sewers or with cesspools, it is essential that means should be taken for preventing sewer-air or cesspool-air from ascending into the drains of the building. This may be effected by a water-trap in the drain at a point near to the sewer or cesspool, with an opening for ventilation on the side of the trap nearest to the workhouse buildings. Such opening may often be in the form of a manhole, giving access to the drain.

With regard to the ordinary drains themselves, which should be formed of impervious pipes, they should in no case whatever pass under or be within any building. If surface water has to be conveyed away from the floor of any building, such as a washhouse for example, it should pass by means of surface channels to gully gratings outside. In the same way every pipe for carrying off waste water, whether from a bath, lavatory, or sink, or the overflow pipe from a cistern, should be taken through an external wall and discharge visibly in the open air over a channel leading to a gully grating outside communicating with the drains. The drains should be laid in direct line and uniform gradient between the points where they change direction or gradient, and at these points it is convenient to provide means of access to the drains for the purpose of inspection or cleansing. Ample means of ventilating the drains of the building by suitable openings at their lower and upper extremities, and of flushing them, should be provided. The soil-pipe from any watercloset should always be outside the building, and be continued up beyond the point of junction with the highest closet, and without diminution of diameter, to some point where it will afford a safe outlet for drain-air. Where privies of any kind are in use, much care and attention is needed to prevent them from becoming a nuisance. They should be so arranged as to avoid any considerable accumulation of filth during a lengthened period. Hence, the size of the receptacle or pit beneath the seat should be strictly limited, and the filth should be removed therefrom at regular and frequent intervals. Ordinarily, a very moderate capacity should suffice for the receptacle, when fixed, of each privy, whilst, if the receptacle be movable, such as a tub or pail, a capacity of more than two cubic feet would be inconvenient. Where fixed receptacles are in use, they ought under no circumstance to be sunk in the ground, but should rather be raised at least three inches above the level of the adjacent ground, and the floor and sides should be made of stone-flagging or other non-absorbent material. The privy receptacle should be so arranged that under no circumstances whatever would rain-water be allowed to enter it, and of course no slop water should be emptied into it.

OUR COMMONPLACE COLUMN.

NEPTUNE.

An ancient Italian God, a marine deity. He is commonly represented with a trident, and with horses or dolphins, and surrounded by tritons and other sea-monsters. He is sometimes shown asleep, or reposing, and sometimes in a state of violent agitation.

NEUTRAL AXIS.

In a beam the neutral axis may be conceived to be a line separating the forces of extension from those of compression. If the ratio of the resistances to these forces were the same in all substances, then in all bodies of the same form the neutral axis would have a definite geometrical position; but Mr. E. Hodgkinson proved that this ratio has a separate value for each substance. In wood, where the ratio is one of equality, the neutral axis in a rectangular beam supported at the ends, passes lengthwise through centre of beam; in cast-iron, in which resistance to compression is greater than that to extension, it is a little above, and in wrought iron, in which the contrary is the case, it is a little below the centre. (See works of Rankine, and other mathematical treatises on construction).

NERO ANTICO.

A celebrated black marble of the ancients, "the grand antique black marble, a breccia black and white, very pure, with great spots broken up by zigzag lines, is extremely rare" ("Arch. Dict.")

NET TRACERY.

This is a form of Decorated tracery, so-called from the resemblance of the pattern to the meshes of a net; each loop is generally quatre foiled. It has a monotonous effect, particularly in large window-heads, and has no central pattern or figure. Examples: east cloister of Westminster Abbey, Peterborough Cathedral, chapel at West Gatehouse. (See "Paley's Manual.")

NEWEL.

This word comes from Old English *Nocl*, *Nowel*, and *Nuel;* French *noyau;* German *spindel.* It is the vertical pillar or post round which the steps turn in a winding stair, each step forming a segment or part of the newel. An "open newel" staircase is where the steps are pinned into wall, and there is no centre-pillar. The term is used also for the post at the angle or foot of an ordinary square staircase. Beautiful instances of newel staircases occur where the newel at the top gives rise to a series of ribs which radiate and form a groined vault, as at Peterborough and Carlisle cathedrals, Alnwick, Belsey, Warkworth castles. In other cases we find hollow newels, sometimes pierced with tracery, which form very pleasing features. At Glamis castle there is a hollow newel, with a doorway for drawing up water at every floor. We may mention also that Mr. Street has introduced this feature in the New Law Courts, where the side staircases of hall have hollow newels, the hollow having another and smaller spiral staircase for private use. Wooden newels were important in the buildings of the Stuart times, and were large, and often elaborately carved and turned. In the time of Elizabeth, the development of the staircase gave to the newel an importance it has never reached since. We refer the reader for examples to Layer Marney Hall, Essex, where the oak newel extends the whole height of stairs; the Palace, Linlithgow (stone newel to stairs leading to Queen Margaret's Bower), Ashton Hall, and nearly all the large halls of that period.

NICHE.

It. *nicchio*, a shell; Fr. *niche.* The niche seems to have been scarcely known to the Greeks, though an instance occurs at Messene. At Baalbec it is found in several temples. There appears to be some hesitation to use the niche among architects, though for throwing out figures by shadow, the niche is a valuable means of effect. They should be quite plain; ornament is to be avoided round or in them, as sometimes seen. An impost carried round a niche is objectionable. As a niche is to receive something, it is a solecism to leave it empty. The depth and size of a niche is important; nothing looks worse than to see a statue forced or squeezed into it. Palladio makes the chin of the statue to be level with the top of impost, the whole head being in the circular part, and this appears to be a rational rule. At the sides of the statue there should be sufficient but not too much space. It is laid down that it should not be less than one-third of the head, nor more than one-half. In some cases pedestals are used to raise the statue. (See "Chambers' Decorative Part of Civil Architecture," the Building News reprint, where remarks on niches and statues will be found. See also "Arch. Dict.") In Gothic, the niche (or tabernacle) is of frequent occurrence. Early English figures were often set on pedestals and canopies are often used above them; these figures occur singly, in pairs, or suites; the heads of niches were trefoiled or plain. For examples we refer to the west front of Wells Cathedral. In the Decorated and Perpendicular styles, canopies are frequent, triangular and often ogee in form; and the niche was made a feature in the tops of buttresses. In plan, the Perpendicular niches were often semi-octagonal, and the canopies were usually of this shape also. For examples, see west fronts of Salisbury, Wells, Exeter Cathedrals; Magdalene Church, Oxford. Parker's "Glossary" contains illustrations of the leading types.

NIMBUS.

The halo or disc encircling the head. Its use is not confined to Christian art, as thought by many, as it has been found in Indian, Egyptian, Etruscan, Greek, and Roman art. "In the Hebrew scriptures we trace, in the absence of representation, the same symbolic idea in the light which shone upon the face of Moses at his return from Sinai (Exod. xxxiv. 29 — 35) and in the light with which the Lord is clothed as with a garment, Ps. ciii. 1, Vulg. (civ. 1, Auth. Vers.); and in the New Testament, in the transfiguration of Our Lord (Luke ix. 31), and in the crowns of the just, to which allusion is so often made. (2 Tim. iv. 8; 1 Peter, v. 4; Apoc. iv. 4). Nevertheless, the nimbus, strictly so-called, is comparatively recent in Christian art, appearing first towards the end of the 5th century. Later in Christian art, it became almost a necessary appendage of all representations of God or of the Saints. Its ordinary form is the circular or semicircular; a form, indeed, in which later symbolists discover an emblem of perfection and of eternity; but the nimbus of the Eternal Father is often in the form of a triangle, and that of the Trinity an emanation of light, the rays of which form the three arms of a cross. The nimbus of the Virgin is sometimes a simple ring and sometimes a crown of diadems, occasionally enriched by an ornamental border, on which twelve stars are sometimes represented. Her nimbus, as well as that of the Divine Persons, is commonly of gold; but that of the Virgin Mary is occasionally in colours, as blue, red, purple, or white. . . In later art, the nimbus became lighter and more aërial, melting, as it were, into the picture; and in Raphael's saints it occasionally fades into the very faintest indication of a golden tinge around the head. Didron mentions the curious instance of a picture of the traitor Judas with a *black nimbus*. . . The 'glory' is a combination of the nimbus and aureole, and is chiefly seen in Byzantine pictures." (Chambers's "Encyc."). (See also Didron's work.)

NORMAN ARCHITECTURE.

As the characteristics of this style are well known, we merely make a few notes and refer to examples. The Norman is a local name merely, it is a branch of the generic style known as Romanesque, to which the Lombardic and Byzantine are related. A great deal of discussion has taken place respecting the limits and features of the style; it is usually considered to have prevailed from the Conquest (1066), through the reigns of William I., William II., Henry I., and Stephen (1154) and the Transition during Henry II. till (1189). The Anglo-Norman work is heavier than the French-Norman; the nave piers are more massive than those in French buildings. The late Sir G. G. Scott in his "Guide to the Architectural Museum" refers to a series of casts of semi-Byzantine capitals, and makes the following appropriate remark:—"Till about 1175 it would appear that the English followed up a Transition of their own founded upon their own Anglo-Norman style, as the Church of St. Cross, near Winchester. After this date it became profoundly influenced by that of France, owing to the employment of a French architect, William of Sens, on the choir of Canterbury cathedral, where he profusely introduced the prevailing details of the French style, and especially the Byzantinesque version of the Corinthian capital and its derivative, the capital *à crochet.* From this time forward an English building is rarely to be found wholly free from French influence, especially evincing itself in the use of the crochet capital along with others of purely English origin—examples at Glastonbury Abbey 1186 - 1200; St. David's, 1180-1200, where the capitals *à crochet* are used alongside of every derivative of the Norman cushion capital." We may name the following examples: Chapel in White Tower, London, said to be the earliest example in England (1081); tower of Rochester cathedral (1077-1130); St. Alban's (1077); Hereford (1079); Gloucester (1088); Ely (1081); transepts of Winchester (1079-1107); Norwich (1096); choir and transept; Parker also adds Colchester Castle; Christ Church, Hants, nave; Durham, nave and transepts (1093 - 1133) Tewkesbury Abbey Church; choir of Peterborough; Porchester Church, Hants; St. Cross, Hants, choir; and of Later Transitional work: Iffley Church, Oxfordshire; Burfreston, Kent; Stewkley Church, Bucks; Jervaulx Abbey, Yorkshire; Peterborough Cathedral, nave and transepts; Romsey Abbey, Hants; and parts of Canterbury and Durham Cathedrals, Byland Abbey, &c. A chronological and classified list is given in Parker's Glossary. Norman architecture in Scotland partakes of the same character, but is less pure—see Dunfermline Abbey, and Churches of Kelso (1128), Dryburgh, Jedburgh, Dunkeld, &c. In these the Transitional character is more advanced than in England, a fact difficult to account for (see "Arch. Dict."). For works, we may direct the student to Dawson Turner's "Tour in Normandy"; Cotman and Turner's "Arch. Antiq. of Normandy"; Britton, Pugin, and Le Keux's "Specimens" (Spiers' Edition); "Notes in Normany," by Godwin; "Sir Gilbert Scott's Lectures"; "Parker's Glossary," &c., in addition to our own pages (see Vol. for 1874).

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

London and Middlesex Archæological Society.—The annual summer excursion of this society was held on Tuesday, Aug. 10, at Enfield, when about eighty of the members and friends assembled at the Grammar School to hear papers read on "The History of Enfield," by Mr. J. O. Ford, and on "The Church and its Monuments," by the vicar, the Rev. G. H. Hodson. The company then inspected the house forming part of the old palace, which contained a panelled room of the Elizabethan period. Progress was then made to Oldbury Camp, to "Durrant's," a brick-built moated house, once the residence of the famous Judge Jeffreys. "Forty Hall" was next visited, where the fine pictures and house (erected by Inigo Jones) were freely inspected. After a drive through Trent-park, the residence of Mr. R. C. L. Bevan, the members returned to Enfield about six o'clock. The next session will commence in November, when the evening meetings will be resumed at 4, St. Martin's-place, W.C.

The Midland Institute.—The usual August excursion of the Archæological section of the (Birmingham) Midland Institute, took place on Friday and Saturday last. The party left Birmingham early on Friday, and arrived at Lincoln about midday. After luncheon the Rev. Canon Venables (who at an hour or two's notice had kindly placed himself at the disposal of the party) conducted the visitors over the Cathedral and town. On Saturday the party left for Newark, which was reached at 10.22. The first place visited was Hawton, about 1½ miles away, where the country church has a magnificent tower of the Perpendicular style. A description of the remains and of the church was read by Mr. Everitt. Returning to Newark, the Church of St. Mary was visited. In the afternoon some of the party proceeded by train to Southwell Minster, and at 6.22 the visitors started homeward, *viâ* Derby.

CHIPS.

The ceremony of laying foundation-stones of a new coffee-tavern and a new arcade took place at Exeter recently. The old grammar-school premises at Eastgate were acquired some time since at a cost of £4,500, and two limited liability companies were formed, and it was decided to construct an arcade connecting High-street with Southern hay, and to build a coffee-tavern on a portion of the site. The plans for both undertakings were prepared by Mr. James Crocker, of Queen-street, Exeter, and these having been accepted by the boards, tenders were invited, and those of Messrs. Stephens and Sons, of Exeter, were accepted, at £9,300 for the arcade and £2,500 for the tavern. Mr. Passmore is clerk of works. The style is Italian, and the arcade will be 225ft. long, with a 15ft. promenade under glazed iron roof, and with 11 shops on either side, having six-roomed houses behind. Two other shops and the coffee-tavern face High-street. The walls will be built of red and white bricks, with freestone dressings, and the roofs will be covered with Welsh slates.

The town council of Lincoln sealed, at their meeting on the 3rd inst., arrangements for the purchase of the works and undertakings of the local gas company.

New schools are about to be built for the school-board of Gelligaer at Penybank, near Vochrica, from the designs of their architect, Mr. John Williams, of Morganstown, Merthyr.

Building Intelligence.

Acaster Malbis.—A new Wesleyan chapel, at Acaster Malbis, near York, was opened on Aug. 12. The edifice itself is in the Early English style, from designs by Mr. C. Anderson, architect, of Lendal, York, and is capable of seating about 150 persons. Mr. J. Simpson, of Priory-street, York, has been the contractor for the work, for the sum of about £890. The chapel is built of stone from Potternewton, relieved by Whitby stone dressings. The porch is a projecting one, with pitch-pine entrance doors, having ornamental iron hinges. The width of the edifice is 23ft., whilst its extreme length is 55ft. The edifice will be heated with Holden's hot-air apparatus, and is ventilated by air-grates and ventilators in the roof. The chancel and porch are laid with Maw and Co.'s ornamental tiles. Mr. Cole, of York, has done the carving work.

Abinger.—The parish-church of Abinger, near Dorking, a building referred to by John Evelyn in his diary as "the melancholy church of Abinger," was reopened on Thursday, the 5th inst., by the Bishop of Winchester. The chancel, repaired in 1858 under Mr. Powell's superintendence, is 13th-century in character, but parts of the nave are a century earlier, while alterations existed of many dates, down to the bellcote added in the Georgian era. The present works comprise a thorough repair of the external structure, especially of the roofs, and internally the addition of an organ-chamber and vestry on the south side; new stalls, and seats in the patrons' aisle of oak; rearrangement of the seating; repairs to heating apparatus, and the replacement of the comparatively modern west window by a memorial one. A new lych-gate of oak has been erected, and the old parish stocks, which stand just outside the church, have had a new cover of oak and railings. Mr. Basil Champneys, of London, was the architect; and Messrs. Colls and Son, of Dorking, the builders; the cost has been £1,500.

Chesterton. — The parish-church of St. Andrew, Old Chesterton, near Cambridge, was reopened on Wednesday, Aug. 4, after completion of restoration. The north porch has been thoroughly restored and re-roofed, the external arch, originally of clunch, having been rebuilt in stone. The tower-arch has been opened to the nave, revealing the unique belfry staircase of the 15th century, by which the original Decorated west window is blocked up. At the eastern end of each aisle a blocked-up window has been opened out, the work on the south side bringing to light a double piscina and fragments of an ogee-arched tomb. The ancient oak benches in the nave have been carefully repaired, and new oak seats provided for the choir, the aisle for the present being provided with cane-seated chairs. The chancel and passages have been paved with red, black, and yellow tiles, by Messrs. Minton, Hollins, and Co., and new floors have been provided throughout the church. The old portion of the rood-screen has been taken down, but it is intended to refix it when it is restored. There are four new stained-glass windows, all placed in the south aisle. A three-light one at the west end has been designed by Mr. G. G. Scott, and the work was executed by Messrs. Burlison and Grylles; the subjects are Adam, Abraham, and Jacob. Mr. Ellis Leech, of Cambridge, filled that at the east end; the figures are SS. Peter, Paul, and Andrew. Messrs. Ward and Hughes undertook another representing "Christ Blessing Little Children," and the remaining one is by Mr. Constable, of Cambridge, the subject being the Adoration of the Magi. Hot-water apparatus has been supplied by Mr. Middleton, of Chesterton; the organ has been enlarged and converted from a single into a double manual organ by Mr. A. T. Miller, of Cambridge. The architect for the restoration was Mr. William Smith, of the Adelphi, London, and the contractors were Messrs. Rattee and Kett, of Cambridge; the cost has been about £2,300.

Churchill.—On Thursday, Aug. 12, the parish-church of St. John, Churchill, Somerset, was reopened, after restoration. The work was undertaken by Mr. Hawkins, of Glastonbury, the contractor, under Mr. Ewan Christian, of London, who was the architect. On the exterior all the pinnacles, turrets, and parapet have been carefully restored. The tower was formerly covered with plaster, but this is removed, and the native stone is visible. The windows of the tower are filled in with traceried stonework. The dressings to the widows and masonry generally are of Bath stone, though this material was not employed in the original erection. The porch has been restored, and a new oaken roof supplied. Inside the floors are newly laid, and open seats of English oak in the nave replace the former unsightly pews. The roof of the nave is thoroughly restored. It is of oak, with new boarding laid on the top of the principals.

Hull.—On Thursday, August 5, the town council resumed their sitting in the council-chamber, after the improvement and entire redecoration of the interior of the town-hall. The more important portions of the decorations, including those in the entrance-hall, council-chamber, banqueting-room, and Mayor's parlour have been designed, and the work was personally superintended, by Mr. Lewis F. Day, of Mecklenburg-square, London, W., the execution being in the hands of Messrs. Campbell and Smith, of Southampton-row, London. Messrs. Simpson and Son, Messrs. Howard and Lightowler, and Mr. Wardle, all of Hull, have carried out the work done in committee-rooms, offices, corridors, and courts; and Messrs. Richardson and Sons, of Bond-street, supplied the upholstery. The borough engineer, Mr. J. Fox Sharpe, directed the improvements effected in the town clerk's, borough engineer's and medical officer of health's offices, and the sanitary arrangements and ventilation have been remodelled. In the council-chamber the walls are mainly of a Pompeian red, and the ceiling is chiefly buff and cedar colour, a large central skylight being filled with rich stained glass, in which ruby and gold colour are plentifully introduced. In the spandrels between the window-arches are shields of arms of the more important countries trading with Hull, such as France, Germany, Russia, Austria, Denmark, Italy, Norway and Sweden, and the United States. The chief interest lies in the four large frescoes, one of which fills a large semicircular space upon each wall. The painting on the north wall, over the Mayor's chair, represents the knighting of De la Pole. The King, by whose side stands Henry, Duke of Lancaster, is in the act of giving the accolade to the kneeling merchant, and on the one side are a bishop and herald, and on the other a group of citizens, with two young pages of the Court. The architectural background is of the 13th century. The second scene, on the south wall, shows Sir John Hotham refusing to admit King Charles into the town. In the centre the King, mounted on a black charger, and surrounded by an escort, claims admittance. Behind the drawbridge, which is just being raised at his command, stands Sir John, the keys of the castle in his hand, and in the background are the walls of Hull. The picture on the eastern wall represents Andrew Marvell acting as secretary to Cromwell. The member for Hull is writing at the dictation of John Milton, who occupies the central position in the scene, his hand raised as he speaks. The Lord Protector is seen entering the chamber through a curtained doorway. The panelled walls of the room are taken from a city building of the period. The last of the subjects, that on the eastern wall, is Wilberforce introducing his motion for the abolition of slavery. Scene, the House of Commons. To the extreme left sits the Speaker in his robes, and, facing him, Wilberforce stands in the act of speaking. On the front bench, facing him, sits Fox, listening, his legs crossed. On a back bench sits Edmund Burke, with folded arms. The costumes are of the period, and the principal actors in the scene are from authentic portraits by Romney, Nollekens, and others. The frescoes are painted by Mr. Frederick Smith, of the firm of Campbell and Smith, of Southampton-row, W.C.

Metropolitan Board of Works.—At the meeting of this board on Friday, a deputation from lessees and occupiers of land on the Cotton Estate, Limehouse, presented a memorial on the subject of floodings from recent storms. Mr. Bryce, M.P., who headed the deputation, spoke of the injury to health and property in the district, caused by the overflow of sewage matter, and said that the district was not very healthy at any time; but it had been found that fevers and other diseases had become much more prevalent in consequence of the recent overflows. The memorial was referred to the works committee. It was decided to address a letter to Mr. Mapleson's solicitors, as to the unpaid rent, now some £3,000 in arrear, for the site of the unfinished National Opera House on the Embankment, and to state that unless satisfactory arrangements are made by Nov. 1st, the board will take further steps. Several tenders were been accepted for the repair of the Albert, Wandsworth, and Waterloo bridges. A letter was ordered to be addressed to certain memorialists in Hackney, stating that the board are not prepared to negotiate with them for the purchase of portions of Hackney Downs and Hackney Marshes. In a conversation as to the rearrangement of the district of West Islington, rendered vacant by the decease of Mr. William Moseley, the late district surveyor; it transpired that the income of the late official was over £1,000 a year. The district will be divided into North-West Islington and South-West Islington, and the elections for the two appointments will take place on Friday, the 8th October, at noon.

Newbottle.—New Board schools at Newbottle, in the county of Durham, were opened on the 2nd inst. The walls are of brick, built hollow; the roofs covered with Welsh slates and red tile ridges. The schools accommodate 315 children in three separate departments, a separate school and class-room being provided for each. The boys' and girls' departments have dual desks and seats. A master's house, containing six rooms, with yard, garden, &c., and a board-room have been erected on the site. The cost of the school buildings, including seats and desks, boundary-walls, outoffices, &c., is under £6 per child. The work has been executed from the designs (selected in competition) and under the superintendence of Mr. W. Fox, architect, of the city of Durham, Mr. Forster, of Spennymoor, being contractor for the whole of the work.

St. Giles' Cathedral, Glasgow.—The restorations on St. Giles' Cathedral Church, have been completed, as far as Dr. W. Chambers is able to proceed, until the nave or western portion of the building is placed at his disposal, which is not likely to be earlier than twelve months hence. The parts last executed are the southern aisles and vaults, formerly unapproachable, but now open for inspection. The most conspicuous additions are the ornamental tiles laid in the south transept and the Moray Aisle, also the iron grill at the Moray Aisle. From this aisle there is a descent of a few steps to a crypt, in which are the tombs of the Regent Murray, Alexander, fourth Earl of Galloway, and the Earl of Athole, Lord High Chancellor of Scotland, with inscribed marble tablets in the pavement indicating the names and dates. From the crypt there is a further short descent to the vault in which was intombed the Marquis of Montrose, in which the name and date, 1661, are likewise inscribed on a tablet. The estimation for the restoration of the southern aisles was £1,500; but the cost has been nearly double that amount.

Sheffield.—New Board Schools at Woodside, Sheffield, were opened on Monday week. The walls are of rock-faced Walkley stone, with dressings of Grenoside ashlar. The roofs are covered with dark Westmoreland slates with red ridges. The accommodation provided is for 310 children in the mixed boys' and girls' department, and for 332 infants. The cost, inclusive of the heavy work of forming the ground, which is on a considerable slope, retaining walls, &c., and for the whole of the boundary walling for the present and future departments, is under £9 per child. The buildings have been erected from the plans of Messrs. Innocent and Brown. The contractors are Messrs. Sharp and Son, and Mr. W. Dickinson is the clerk of works.

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The parish-church of Aldeby, near Beccles, formerly attached to an adjoining Benedictine priory, was reopened recently, after restoration of the nave. The church was, till recently, in a sad state of dilapidation and decay, but the high square pews of great size and uncomfortable forms have been replaced by open benches, the floors relaid, and the stonework repaired. The work has been carried out from the plans of Mr. J. Bond Pearce, of Norwich, by Mr. Alfred Grimmer, builder, of Wheatacre; the stonework was done by Mr. F. J. Allen, of Beccles.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Received.—R. J. A.—B. of B.—C. C.

Correspondence.

A NATIONAL BENEFIT SOCIETY.

To the Editor of the Building News.

Sir,—You are generally so correct in your statements and deductions, and confidence in them is so established, that when an inadvertency arises, it makes its correction of more importance.

In your last week's Building News, in your reference to my article in the *Fortnightly Review* of this month, on "Friendly Societies, their Position and Prospects," you say Mr. Randell suggests the desirability of establishing a National Benefit Society, with a national guarantee, similar to that of the National Savings Bank, to which a minimum contribution, securing a minimum benefit, should be made compulsory, on the part of every young *working man* from the age of eighteen to twenty-one.

I could not advocate the working man being compelled to pay, and others not to be compelled; and to seek to draw a line between those who should be called on to pay and those who need not be called on, would, I think, be a fatal difficulty to such organisation.

The organisation I referred to was that proposed by the Rev. W. L. Blackley, and it is incorrect to limit it to working men, or to men. Mr. Blackley proposes that every person shall give a guarantee to the State against their ever becoming a burden to the State. He truly observes those who are rich when young may be poor before they die. Therefore, instead of every "young working man," it should be every young person.

The millions paid yearly to Friendly Societies, the large amounts received annually by the industrial assurance offices, and the amounts annually deposited with the Post Office Savings Bank (the returns of which show us that female servants are the most numerous class of depositors), all evidence the power with the industrial classes, to make the necessary payments to secure their independence, if the necessary organisation was accessible to them. Till such organisation is provided, I fear a very large portion of the savings of the industrial classes will continue to be lost to them, and till *all* are included in such organisation, both male and female, there will be no hope of seeing the industrial classes rise above the poor laws, and of those laws dying out.—I am, &c.,

James S. Randell.

IRON IN PORTLAND CEMENT.

Sir,—Permit me to thank Mr. Reid for the pains he has taken to prove that iron in its free condition does exist in Portland cement; but I much regret that he has not given us the interesting details he has obtained, as I am sure neither you nor your readers would have been "troubled" with them. If any one is convinced against his will, I think readers of Mr. Reid's letters will consider it is that gentleman himself. In his first letter he doubted my seriousness, and simply ignored my statements, and propounded the "nut-and-bolt theory." Next we had the loose iron in gas-coke idea, and, lastly, Mr. Reid having investigated the subject for himself, now finds my views correct.

Presuming that Mr. Walter F. Reid is the same gentleman whose analyses are so often quoted by Mr. H. Reid in the 1877 edition of his book on Cement, and who bas been aware of the existence of free iron in cement for the past six years, I am surprised that Mr. H. Reid was not also aware of the fact. Or are we to gather that in the analysis there quoted, the free iron had escaped the notice of the chemist? Mr. W. F. Reid may have hit on the true theory of the existence of iron in cement, and now assuming that fact to be at last beyond dispute, I will ask in conclusion, Is the presence of free iron injurious to cement? We must not forget that Mr. Reid in his first letter distinctly said that "iron, in even the mildest and least objectionable form in Portland cement, is more or less dangerous," and on the 19th ult. said tbat "he had no doubt also that a considerable addition is made from carelessness on the part of the makers themselves," knowing "from experience that there are cement consumers who neither use sieve, testing-machine, nor even common sense, and confidingly take cement so long as it is in a cask and sack with a maker's name labelled thereon." Certainly Mr. Reid seems to have had "too much faith in the honesty of cement makers."

As Mr. Reid kindly suggests this may be a craze of mine, I can only say that my experience has shown me that the magnet is a valuable aid to the triple test, and I would strongly advise your readers, when testing, to use it, and feel sure that they will find that the addition of free iron, whether due to accident, carelessness, adulteration, or, as suggested by Mr. W. L. Reid, to being smelted from shale, is deleterious.—I am, &c., "Magnet."

IMPROVED ASH-PITS.

Sir,—The old form of ash-pit and convenience, notwithstanding their many sanitary disadvantages, are still the rule in many towns. In the rural districts common middens remain to a large extent, which are still more objectionable.

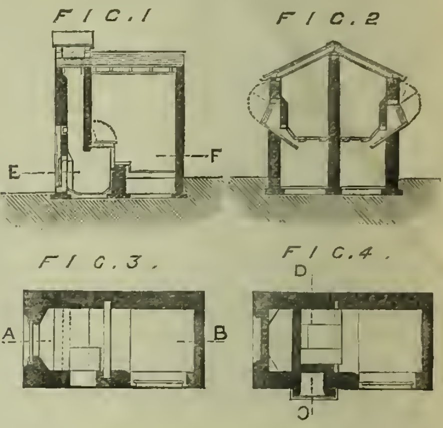
Ignorance of the laws of health, and false economy will in some measure account for a continuance of these evils. In some towns, and in the suburban districts, a modified form of ash-pit and convenience might, I think, be adopted, without in any way endangering health. Improvements have already been made in their construction in some places, but the ash-pit accommodation generally is greatly in excess, and still more is liable to be overcharged, and the ashes often are not properly distributed over the excrement. I have lately erected "Improved ash-pits" to some houses here, which, I think, possess the requisite sanitary advantages, and are likely to answer their purpose exceedingly well. The ashes being deposited in the shoot (which is a cleansed flag) falls direct upon the excrement. The vault, which will contain about 1 cubic yard of soil, cannot be overcharged. Less facility is also given for the throwing in of garbage, &c.

The emptying door, next the back road, avoids the necessity of entering the vault for the purpose of clearing out same.

Ample ventilation is also provided in the air-shaft at the back by air-grids at the bottom, and large openings or outlets at the top. The convenience is more capacious than usually made, and well ventilated. Few ordinary dwellings, the size of the vault, will be sufficiently large for about six months' use, and the cost of the erection is only about the same as for an ash-pit and convenience upon the *old plan*, the building being considerably reduced in length.

I inclose you a sketch of the plan adopted by myself. I have no patents to protect in connection with same, but hope the old form of ash-pit and convenience may soon be entirely done away, and replaced by others fulfilling all the sanitary requirements. Fig. 1 is section on line A B of sectional plan; Fig. 2 is section of pair of conveniences at line C D of ground plan; Fig. 3, sectional plan on line E F; Fig. 4, ground plan.—I am, &c., W. Brown.

St. Martin's-buildings, Micklegate, York,
Aug. 14.



WALSINGHAM.

Sir,—May I express a hope that the Architectural Association will make a ground-plan of the Grey Friars House at Walsingham, and publish it in your pages. Last week I was unable to obtain access to it, or I should have devoted some time to the same object. We have few remains of Franciscan arrangement, and none so perfect as these appeared to me from a tantalising bird's-eye view over walls from a high adjoining bank.

The "Cadaver" bas been well explained by your correspondents, and is so common a feature in Mediæval sculpture, that it did not seem to require more than a curt refutation of a popular error which was long since exposed.—I am, &c., Mackenzie E. C. Walcott.

PINHOE CHURCH.

Sir,—Your correspondent corrects an omission in your necessarily curtailed report of the above recent restoration, and whilst doing so, himself, inadvertently makes others.

The task of restoring the grandly groined old rood-screen, one of the finest samples in Devonshire, of renovating the interesting Late Perpendicular pulpit, of repairing the almost unique and curiously sculptured poor box (concerning which some correspondence took place in these columns early in 1878, when Precentor Mackenzie E. C. Walcott ascribed its date to the beginning of the last century), the conservative making good of the original old carved bench-ends, the creation of carved angels in the roof, and of carved figures in the chancel stall standards, the provision of an oak lectern altar-table, and of a marble retable were amongst the items not embraced in his contract.

Under the immediate direction of Messrs. Ewan Christian and R. Medley Fulford, these works were carried out by assistants in the employ of

Harry Hems.

Intercommunication.

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QUESTIONS.

[6201.]—**Hanging Sashes.**—Will any of your numerous readers inform me of any mode of hanging sashes to dispense with the usual cords and weights? My wish is to work a single sash about 4ft. square.—Ventnor.

[6202.]—**Master v. Pupil.**—I have the misfortune to be articled to an architect who, although not a bankrupt, has recently been sold out, when all his instruments, books, &c., were seized, the consequence being that he cannot properly instruct me. He has also entirely lost his practice. Under these circumstances, can I claim the remaining 18 months of my time?—Pupil.

[6203.]—**Tank.**—There is an open tank about 40ft. by 12ft. by 2ft. 6in. deep, on the roof of a factory. The bottom is formed of brick arches and iron girders, concreted and cemented. The sides, which are of stone walling, are also cemented. The cement is much cracked, and the tank will not hold water. It is very important that it should be made to hold. Could not this be done by putting a lining of concrete around the sides, battering from 1ft. at the bottom to 3in. thick at the top, with a facing of cement 1in. in thickness over the whole? Perhaps some of your readers could give me their opinions, or suggest some other method likely to prove a success.—C. S.

REPLIES.

[6177.]—**Damp-Proof Brick-Coloured Composition.**—As "Mason" has not yet received a direct answer to his question, I should suggest he waits a time before defacing his house with composition. I have frequently noticed walls in new houses to be damp (where exposed to continuous rains) that have after a time become perfectly dry. Possessing as he does a hollow wall (one of the best means of preventing damp), it would be a good plan to ventilate the walls by inserting air-bricks, two or three courses above ground, and just below square of building.—Bricklayer.

[6182.]—**Numerical Value of Log.**—The rule for raising any number to a given power by means of logarithms is—Multiply the logarithm of the number by the index of the given power, and the product thus obtained is the logarithm of the required power of the number. To apply this rule to the particular case in question it is necessary to multiply the log. of 10, which is 1, by the index of the given power, which is 1·079181, and the product thus obtained 1·079181 is the log. of $10^{1.079181}$. It is now only necessary to refer to the tables and find the number corresponding to this logarithm. We find it to be 12·8208879. Hence we know that $10^{1.079181}$ equal 12·8208879.—S. H.

[6190.]—**Brick Footings to Tank.**—If "G. C.' will just take the trouble to arrange his bricks he will find that he cannot have all headers. If he has 2½in. offsets a stretcher comes in every alternate course. I always keep stretchers inside where width of wall allows. Bricks are seldom filled in thick walls as stretchers, though it makes but little difference to despatch of work. But surely a matter so simple might be left to workmen.—Bricklayer.

[6197.]—**Damp House.**—Nine-inch outer walls can never be depended upon for keeping out damp, and ivy or any creeper greatly increases its liability. I consider the best remedy would be first to insert a proper damp-course, the whole thickness of walls, and, say, 6in. above the ground line. Take down the ivy and cover the wall with a good coat of cement stucco, or, if you prefer it, cover the walls with trowelled stucco, and paint it when thoroughly dry.—Alfred.

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PARLIAMENTARY NOTES.

London Water Supply.—On Monday, in the House of Lords, Lord Fortescue having directed attention to the tank system of intermittent water supply in the Metropolis, and asked whether the Government meant to take measures to remedy the evil, and whether they had offered other terms for the purchase of the water-works than those which had lately been rejected, Lord Fife returned a negative reply. The report on which the question was founded had only been issued a week; but the Government were prepared to give effect to the recommendation of the Select Committee of the House of Commons, that an independent water authority should be constituted, with powers to deal with the whole matter.

The British Museum.—Captain Aylmer on Friday last asked the First Commissioner of Works whether he was aware that the new building proposed to be erected at the British Museum would be in close proximity to other houses already erected; and if so, whether he would give instructions that the roofs of the new building, which would be on a lower level than the surrounding houses, should be constructed of fireproof materials.—Mr. Adam.—If, as I presume is the case, the hon. gentleman's question refers to a new building proposed to be erected in Montagu-street for the British Museum, I may inform him that no working plans have as yet been prepared for that building. It will be in proximity to other buildings; but every precaution will be taken to render the roof fireproof, in the same manner as the other buildings belonging to the British Museum, which are considered to be safe from fire from any external causes.

LEGAL INTELLIGENCE.

The Powers of District Surveyors—Important Legal Question.—Last week, at the Marlborough-street Police-court, before R. Newton, Esq., the case of Kerr v. Webster was heard, in which the complainant, as district surveyor of St. James's, Westminster, summoned Mr. Wm. Webster, builder and contractor, for having disobeyed an order of the Metropolitan Board of Works to alter the construction of a chimney at the Criterion restaurant, by providing and fixing an additional stay of H iron 9in. deep, secured at the foot by a wrought-iron strip passing round the said chimney-stack, "in the manner shown upon the half-inch scale drawing supplied by Mr. Verity, architect of the building, appearing before the Board on the builder's behalf, in respect of his disagreement with the said district surveyor." Mr. Taylor, solicitor, appeared for the defendant. Mr. Kerr, having been sworn, stated that in the month of May, 1879, the chimney in question was discovered by him to have been erected on the old building of the Criterion restaurant without notice having been given. The chimney reached to a very great height, something like 40ft., which was considerably more than six times the least width, the latter being the limit prescribed by statute. On discovering that the chimney had been so erected, he (witness) communicated with Mr. Thomas Verity, the architect of the building. They corresponded for several months, and he was under the impression that Mr. Verity intended applying for the sanction of the Board of Works. He did not do so, however, and witness's patience being exhausted he, in Sept., 1879, gave Mr. Webster, the contractor, notice to amend the work, and summoned him in Nov., 1879, for neglecting to obey the notice. The case came before Mr. Mansfield, when the preliminary objection was taken that the Criterion was a public building, and although witness contended that the clause in regard to public buildings could not safely be held to apply to a chimney, Mr. Mansfield eventually decided that it was a public building. After that, the dispute between witness and defendant was by agreement referred to the Board of Works, and the result was that they ordered the work to be amended in the manner set forth in the present summons. Mr. Newton: Did you say that Mr. Mansfield decided that the Criterion was a public building? Mr. Taylor: Yes. It is a public building, being licensed for dancing, and all the rest of it. Mr. Newton: That does not make it a public building. Mr. Kerr: When we got the decision of the Board of Works, Mr. Verity signified that their order would not be obeyed, and therefore I had to bring this summons before you. Mr. Newton: If Mr. Mansfield has decided it to be a public building, then it comes under section 30, and it won't come under sections 45 and 46. Mr. Kerr: Yes, it will! Mr. Taylor: No; that is just the point. Mr. Kerr: There is no rule laid down in the Act for carrying out the decisions of the Metropolitan Board, and therefore we have always been accustomed to say that we must proceed upon the order of the Board of Works, as if it were a clause of the Act, for the occasion. I gave notice to Mr. Webster to obey the order in this case, and upon his disobedience I have come before you to ask you to compel him to carry out the order of the Board as if it were a requirement of the Act itself, the order being duly arrived at by the Board under the powers of the Act. Mr. Newton: You say, Mr. Taylor, that this comes under the 30th section? Mr. Taylor: Yes. Mr. Newton: Then how can the Board or Works enforce the order? Mr. Taylor: I presume they have their own machinery for the purpose. At any rate, they have not power to alter an Act which excludes a public building from the control of the surveyor. Application has been made to the Board of Works, and they have made their order. Mr. Newton: Which you refuse to obey? Mr. Taylor: It has not been obeyed, certainly. Mr. Newton: I don't see what other machinery there could be to enforce the order than that which has been used in this case. Mr. Taylor: The Act says that, in the event of disagreement between the district surveyor and the builder, the matter in dispute shall be referred to the Board of Works. That having been done in this case, the matter is out of the district surveyor's hands, and he should have nothing to do with this application. Mr. Newton: Who should, then? Mr. Taylor: The Board, by their public officer, whoever he may be. Mr. Kerr: I am. Mr. Taylor: You are not, for this purpose. I contend that Mr. Kerr has no right to take proceedings after the matter has been placed in the hands of the Board. The Board must themselves take proceedings to carry their order into effect. I see nothing in the Act which gives the magistrate power to enforce such an order. Mr. Newton: Then, according to your contention, you can do anything you like? Mr. Taylor: Well, there may be a defect in the Act, but I see no clause giving the magistrate power to enforce an order of the Board made under these circumstances. Mr. Newton: Then the better plan will be, if that is your contention, for you to appeal against my decision. Mr. Taylor: But I have at present stated only one of my objections. If we do have to appeal, we should like to have it on satisfactory bases. My second contention is that the wrong party has been summoned. Mr. Newton: Defendant is the builder. Mr. Taylor: But in the case of a public building the responsible party is the building owner. Mr. Newton: I don't see anything in the Act to say the builder is not to be the person summoned here. Mr. Kerr: The architect is allowed to appear before the Board of Works under their by-laws, but that does not relieve the builder of his responsibility. Mr. Taylor: In this case the builder has been off the premises a long time. He completed his contract on the 5th March, 1880, and therefore, so far as his liability is concerned, he is quite free. I don't say that there is not some responsible person who may be summoned, but the contractor cannot be liable, otherwise he would never be free. Mr. Kerr, in reply to the magistrate, said the chimney was built 15 months ago, and he had been complaining about it ever since. The first notice was served, and the original proceedings in this court instituted, before the defendant finished his contract, and within six months of the commission of the offence. Mr. Taylor pointed out that Mr. Mansfield never adjudicated upon the original summons, but referred the matter in dispute to the Board. Mr. Newton said he was against Mr. Taylor on this point, as he considered the summons was a continuation of the original contentious proceedings. Mr. Taylor said he had a third objection to raise, which he considered must be fatal to this summons. The summons was based on the decision of the Board of Works, but upon examination his worship would would find that throughout the document embodying the Board's decision no mention whatever was made of Mr. Webster, the defendant, and he was no party to the matter at all. The words used in the recital were: "The Board then proceeded to consider the matter of disagreement between Mr. Kerr, district surveyor, and Mr. Thomas Verity, architect," &c. Mr. Newton: Your argument amounts to this, that Mr. Verity, and not the defendant, is the proper person to be summoned? Mr. Taylor: Perhaps so. Mr. Newton: And if Mr. Verity had been summoned your answer would have been that the builder was the proper person under sec. 30. Mr. Taylor: No; I say that the builder is clearly out of it. Mr. Newton: Who do you say is the proper person then? Mr. Taylor: I should think the building owners, Messrs. Spiers and Pond. Mr. Newton: Then you hold yourselves above everybody. You say neither Mr. Webster nor Mr. Verity is liable? Mr. Taylor: All I say at present in this case is, that Mr. Webster is not. Mr. Kerr: The proceedings have been taken against Mr. Webster throughout. Mr. Newton: Have you any other objections to urge? Mr. Taylor: No, sir. If you are against me on the question of jurisdiction, I ask for a case, and we need not go into the other points at all. Or perhaps it will be more satisfactory if you make an order, so that we can appeal against it. Mr. Newton: Very well, I will make the order; and when the Queen's Bench next sits you can ask for the order to come before them, and move to quash it. Mr. Taylor: Yes, we will either do it that way or leave it to be enforced. Mr. Newton then made the order, observing that Messrs. Spiers and Pond would find it much cheaper in the end to do what Mr. Kerr asked than to waste time and money in litigation.

A Builder's Bankruptcy.—Re Thomas Pink.—In this liquidation petition, which came before Mr. Registrar Murray, at the Court of Bankruptcy, on Friday, the debtor was an extensive builder and contractor at Battersea, residing in Pont-street, Belgrave-square, and trading as "Thomas Pink and Son." The indebtedness amounted to about £12,000, and the assets were estimated at £8,000, consisting of stock-in-trade. Mr. Nicholson, as counsel for the debtor, applied to appoint Mr. Seear, of Holborn Viaduct, as receiver; and also for an interim judgment to restrain legal proceedings until after the first meeting of creditors under the petition. His Honour granted both applications.

Free Water Supply for Builders.—At the Southern Divisional Police-court, Dublin, on Wednesday week, before Mr. Woodlock, Mr. Henry Edward Hall, builder, of 44, Victoria-street, appeared to answer a summons, issued at the instance of the Waterworks Committee of the Corporation, for an alleged violation of the Local Water Act, in that, without being authorised so to do, he took, or caused to be taken, from a barrel in Harrington-street, a quantity of water for the purpose of mixing mortar for building. A preliminary objection was taken by defendant's solicitor that the offence took place as long ago as the 29th June, but the magistrate over-ruled it, observing that power had not been given the Corporation to arrest on the spot when such an offence as alleged was committed. Mr. Mervyn

Crompton, supervisor of waterworks, then deposed that on the morning of 29th June he found that in Harrington-street Mr. Hall (defendant) was building four houses, and that close by a Mr. Henry was also building houses. The latter contractor had a barrel on his works supplied with the corporation water. Witness saw one of defendant's men go with a bucket in his hand, take some water from Henry's barrel, and use it for mixing with mortar for use in defendant's building operations. Defendant's solicitor raised two objections, that defendant gave no authorisation, and if he did, the water belonged to Mr. Henry, and not to the Corporation; but for the plaintiff the terms of the special Act of Parliament were quoted against the second plea; and as to the first, it was shown that defendant had no other supply than that borrowed. A penalty of 21s., with costs, was inflicted; a case being granted for appeal.

WATER SUPPLY AND SANITARY MATTERS.

Sowerby Bridge.—The Sowerby Bridge sewage scheme, designed by Messrs. Utley and Gray, civil engineers, of Halifax and Sowerby Bridge, has now received the approval of the Local Government Board. Mr. Godfrey Rhodes, solicitor, clerk to the local board, received on the 9th August the official intimation that the plans and estimates were passed, and sanction granted to borrow the amount (£15,143) required to carry out the works, repayable as to the sum of £10,643 in thirty years, and the remaining £4,500 in fifty years. The works comprise four miles of main sewers, with all necessary manholes, ventilation shafts, and flushing arrangements; also two wrought-iron siphons under the river Calder, one, cast-iron, crossing under the Rochdale Canal, and one under the Ryburn, together with the tanks, buildings, &c., which are designed upon the best modern principles for economically and effectually treating sewage. The outfall works will be constructed in the Holmes between the Lancashire and Yorkshire Railway and the river Calder, immediately opposite Messrs. Norris' chemical works. Mr. Hanson's process of treating the sewage was explained by the patentee at the public inquiry held by Mr. Robert Morgan, C.E., on the 11th June last, and has been approved by the Local Government Board in conjunction with this scheme.

CHIPS.

A beacon is about to be erected on the High Cross Rock, Skerries, for the Dublin Port and Docks Board, and from the designs and specifications of their engineer, Mr. Bindon B. Stoney, of Dublin.

The vestry of Mile End Old Town, after great delay, and incurring legal expenses, have succeeded in preventing a Trafalgar-square in that district from being built over. The square will be thrown open to the public, and will be kept in repair by the owners as an open space.

The Bermondsey Vestry, on the 9th inst., sealed a contract with Messrs. Perry and Co., for the erection of new Vestry-hall and offices, at a cost of £20,000.

Mr. Hawkesley, C.E., of Westminster, has been instructed by the Ashford local board to inspect and report on the waterworks, in view of the possible transfer of the works from a limited liability company to the public authority.

A new school is about to be added in Brunswick-terrace at the rear of the Wesleyan chapel in Camberwell-road, near the "Gate." Mr. Charles Bell is the architect.

The town council of Penzance received, on Wednesday week, a report from a committee, announcing the death of Mr. Robbins, one of the contractors for the new docks works. It having been stated that these improvements are being satisfactorily carried out, it was decided to accept the offer by Mr. Chard, one of the executors of Mr. Robbins, to execute the contract for the graving dock in its entirety, and for the completion of the excavation under the New Street slip.

The West Ham local board of health have increased the salary of Mr. Horseman, engineer at the Abbey Mills pumping station, from £150 to £200 a year.

On Sunday last the parish-church of St. George's, Camberwell, was re-opened, after a complete renovation, carried out by Mr. L. C. Shipton. The new pulpit is designed, carved, illuminated, and presented by Mr. R. C. Baker.

The Council of the Glasgow Mechanics' Institution—almost the parent of the similar organisations throughout the kingdom, and just endowed and remodelled as a technical school—have appointed Mr. Andrew Jamieson as principal. Mr. Jamieson is an associate member of the Institution of Civil Engineers, and a member of the Society of Telegraph Engineers.

Our Office Table.

Mr. Shoolbred, engineer, of London, has just completed the survey of the country lying between Hassop and Dore, and towards Hathersage and Castleton, with a view to opening up the Derwent Valley and adjoining districts to railway communication. Leaving the Hassop station of the Midland Railway, the line will proceed to Grindleford Bridge, within sight of Longshawe Lodge, the Duke of Rutland's shooting-box for his extensive moors. Here will be a junction, from which a branch will go to Hathersage and Castleton, thus tapping the lead-mine country. A few miles from Grindleford Bridge is Calver, where another station will be made which will afford easy access to Baslow for Chatsworth. Calver Station will also be near to Froggatt Edge, Stoney Middleton, and Curbar. Leaving Calver, the railway will follow the Derwent part of the way, and join the main line of the Midland at Dore and Totley Station, within five miles of Sheffield. The proposed railway will obviate the necessity of Sheffield passengers going round by Ambergate Junction to reach Bakewell and Matlock, and will practically give Sheffield a second route to Manchester.

The ruined cities of Central America are about to be systematically explored. An expedition is shortly to be despatched, under the joint auspices of the French and American Governments, the expense being jointly defrayed by Mr. Pierre Lorillard, of New York, the original promoter of the undertaking, and by the French Government. The leader of the expedition is to be M. Charnay, a traveller who has already made two journeys in Mexico. Photographs of bas-reliefs and hieroglyphic inscriptions will be taken, and in the more important cases careful casts as well. The exploring party will visit Mount Alban, Mitla, Palenque, and other great centres of ancient civilisation. Its route will lie through Oaxaca, Tehuantepec, and Guatemala, terminating in the peninsula of Yucatan, where the ground is "to a great extent fresh." There have been many books written on this part of the world, the most important work hitherto having been that of Stephens and Catherwood; but there is a great deal still to learn of the language and monuments of the ancient people who seem to have developed a great civilisation in Central America long before the first European set foot in the New World. The origin of these people is in itself a puzzle. Some authorities believe them to be autochthonous, and their civilisation to be wholly independent of any civilisation that has existed in the Old World. Others maintain the unity of the human race, and argue for an immigration of primitive races from Asia into America, across Behring's Straits, while others again believe that dry land once extended from America as far as the Canaries.

The ceremony of laying the foundation of the Cowper-street buildings for Technical Education has been postponed, but the plans are being prepared. They differ from those originally published, inasmuch as the buildings will be larger, and planned to include a mechanics' department, as well as the physical and chemical. The building will be called "The City and Guilds' Technical College, Finsbury." The committee have elected as architect for the central institution, to be erected at Kensington, Mr. Waterhouse (the architect of Owens Science Schools, Manchester, the buildings for the textile department of the Yorkshire College of Science, and other similar buildings). The cost of this building will be £50,000. The Finsbury buildings will cost £20,000, one-half of which will be born, by the City and Guilds of London Institute of Technical Education, and the other half by the Drapers' Company.

A New Screw, according to the *Ironmonger*, promises to have an important place in the market in the near future, which the established companies feel a natural interest in discouraging. It is a well-known fact that the great bulk of the screws used are set in with the hammer, and given a turn or two with a screw-driver to bring them flush. Recognising this fact, an ingenious inventor, for many years somewhat prominently identified with the business, has brought out a new screw, which is adapted for driving, and which enters the wood without tearing the grain. The gimlet point is dispensed with, and a cone point substituted. The thread has such a pitch that it drives in barb fashion, offering no resistance in entering, but firmly resisting all attempts to withdraw it except by turning it out with the screwdriver. The head is flat, but in setting it up two nipples or square-shouldered projections are raised in it by the one operation. The screwdriver takes hold of them more easily than it does of the customary nick, and holds quite as firmly, and when driven flush the projections on the head are not in the way, and do not disfigure it. It is claimed that this screw can be made one-third cheaper than ordinary screws, the principal saving being effected in doing away with the necessity for sawing the nick in the head. This consumes more time than any other one item of the manufacture, and is very destructive of saws, which are expensive and have to be kept on hand in large quantities.

We hope it is not true, but a London correspondent of a provincial paper declares that south London is at this moment in very imminent danger of a water-famine, and, what is more worthy of notice, from the possible failure in the supply from the company which, under the proposed agreement was to receive by far the largest proportional award. Not only are the Battersea reservoirs of this company almost empty, but their maintenance, even at the present low level, is dependent upon a single engine. Should the piston-rod break, or any of those possible accidents happen which are not uncommon even with the best machinery, the whole of the districts supplied from this source would be left without a drop of water. The company, possibly in view of the proposed purchase, never has taken the precaution to fit up machinery which, in case of need, could be at once made use of in the event of an accident, and not the least allowance was made in Mr. E. J. Smith's liberal award for the absolutely necessary outlay which this company would be forced to make, unless it forfeited its privileges, or abandoned the undertaking altogether.

At ten o'clock on Saturday morning last the last stone of the cross ornamenting the top of the pinnacle of the second of the two great spires of the cathedral of Cologne was finally fixed in its place. Begun on August 14th, 1248, it has thus taken no less than six hundred and thirty-two years to complete the gigantic structure. After the main portion had been consecrated in 1322, but little progress was made for centuries. The ancient archbishops of the place, having many churches at their disposal, neglected the finest of them, deterred, as it were, by the transcendent grandeur of the design. Only after the cessation of ecclesiastical rule and the incorporation of the Rhenish territory with Prussia was the building taken in hand again. In 1817 King Frederick William the Third bestowed some money on the Cathedral Chapter to enable them to resume operations; in 1842 Frederick William IV., his son and successor, revived the undertaking by a solemn inaugural festivity and the donation of a large sum. Donations began to flow in more liberally, and after another building period of thirty-two years the great work stands perfect.

The National Health Society, Berners-street, is calling the attention of the vestries of the metropolis to the unwholesome condition of the streets of London in hot weather. In a document signed on behalf of the Council it was represented that the intolerable smells that have lately pervaded the streets of the West-end have been the subject of frequent complaints. Streets smelling like very badly-kept stable yards have been throughout the past and other seasons injurious to health and prejudicial to trade. Then the surface-cleaning of the streets was so imperfect in the greater part of London that much filth which should be removed remained upon the streets in a state of decomposition. In Paris, Vienna, or Madrid, the streets were thoroughly well washed and cleansed. In the City of London, the hydrants which are now in use for protection from fire might well be made serviceable for washing the streets and flushing the sewers. Heavy thunder showers and storms of rain occasionally acted as scavengers, and actually diminished the death-rate. Much might be done by amending the form of the sewers and making them self-cleansing. It was said that when this had been done in a part of Holborn the expense had been less than that involved in cleansing them by flushing. No doubt the early attainment of a water-supply under competent scientific and public control would be the most effective means of remedying these evils.

THE BUILDING NEWS.

LONDON, FRIDAY, AUGUST 27, 1880.

WHAT IS MORTAR?

THERE could not be a more puzzling question put to one whose experience was limited to the building practices of the metropolis, for, within its wide extent, there are many varieties of mortar used for the purposes of construction. The word itself is of ambiguous origin, but its derivation is generally supposed to have been derived, like many other good building names and practices, from the Romans, who required that the lime used by them should be rendered thoroughly homogeneous, and its particles perfectly reduced in the "mortarium" before being used. In addition to this precaution, it was also the custom, more especially during the reign of the Emperor Augustus, that a preliminary probation of two years should take place before even the mortar was permitted to be used for building purposes. The general application of the word "mortar" may be regarded as being applied generically, for there is no absolute value attached to the term in itself, and by itself. Mortar being a compound concocted of such variable ingredients, and subject to a great variety of treatment, no specific value or estimation is possible, unless it is described as being composed of a certain quality of lime, to be mixed with a definite quantity of sand.

The best and most desirable property in a good mortar is that the materials of which it is composed shall not only be competent to secure profitable coherency of its component parts, but also possess the quality of adhesiveness, and thus bind together the bricks or other forms in the building in which it may be used.

The Romans, dealing generally with lime derived from comparatively pure carbonates, resorted to many schemes for overcoming the tendency of limes obtained from such sources either to part too readily with their water of hydration, or not to part with it at all. If from the first cause, the result would be a dusty, pulverised mass, and, if from the latter, a wet pasty product, both alike incompetent to secure their own coherency, or impart any benefit to the materials with which they were associated. Hence, we find in the best remains of the old Roman mortars a careful and perfect blending of the lime with the sand, and, generally, the insertion of thin porous tiles or bricks to absorb any superfluity of moisture, while, for hydraulic purposes, puzzolano and trass were used in combination with pure limes for works under, or in, water. For whatever purposes, and under all circumstances, it was a condition imposed upon all engaged in building operations that the ingredients of which the mortar was composed should be intimately mixed together.

From a full appreciation of the benefits to be derived from a careful blending of the lime and sand, the early English engineers and architects resorted to the practice of beating the mortar. Smeaton adopted that mode of preparing his Eddystone mortar for the famous lighthouse, and it is from that starting-point we first begin to understand the value of the impure limestone, which had, until that time, almost been regarded as worthless for building purposes. Chemical knowledge, such as it was at that period, assisted in estimating the true value of those impurities, and Smeaton's labours, guided by such rules as he could command, clearly indicated the source from which the Lias limes more especially derived their hydraulicity or water-setting capacity. The advantage of so valuable a property enabled the engineer to construct docks, harbours, and such works fearlessly: but this discovery had even a much wider influence, for it proved that limes derived from such sources possessed the hitherto unknown faculty of cohesiveness. The importance of this valuable property secured the advantage of not only holding bricks, and such like materials, together by the force of adhesion, but it also commanded that which had not, until then, been accomplished—unless by the introduction of foreign substances—namely, the perfect cohesion of the mortar itself. Common mortars, derived from pure carbonates of lime, possessed, in a high degree, the capacity of adhesiveness; but they were unable to maintain their own coherency unless their particles were accurately separated by the introduction of sand, or other suitable mechanical agency. Hitherto, the engineer and architect were troubled by the necessity of perfect slaking of the lime before it could be profitably combined with the sand, and many ingenious practices were resorted to, by the aid of water and air, to accomplish this desirable object. The new limes, however, containing silica, alumina, &c., were difficult to slake, and the practice of grinding the lime was introduced, which not only permitted its accurate combination with the sand, but secured another advantage, inasmuch as lime so treated could be kept for a length of time when carefully packed and protected from the air. This great advantage was originally realised by Smeaton, who was enabled to use some of the lime prepared for the Eddystone Lighthouse several years after the completion of that great building in other engineering works in the North of England.

It would have been well for the country generally, and for the reputation of constructors especially, if the lines on which Smeaton and his contemporaries worked had received more attention and consideration at the hands of their successors. The beginning of this century, however, owing to the great increase in the prosperity of the country, necessitated the erection of extensive works in canals and docks, involving the employment of a new element in construction, in the shape of the contractor. This new system relieved the engineer of much of his proper duties, and, at the same time, practically deprived him of the onus of carrying on the works, and certainly took out of his hands the personal accurate conduct and control of the details of their execution, for the success and efficiency of which he was primarily responsible. The decadence of materials and quality of work may be said to date from this time, not altogether from the apathy of the engineering control, but because works were undertaken beyond the means which could be commanded for their completion. The contractor, therefore, became master of the situation, and continued, in many cases, the progress of the works at his own risk, and with his own means; and, under such circumstances, the quality of the work could not be very efficiently controlled, or even challenged, by the engineer. To show what evil results sprang from such contractors' work, we will mention a striking instance in connection with one of the earliest metropolitan lines, which was finished, and, indeed, almost entirely made, by a well-known contractor. After holding the line of railway in pawn for some years, until he was paid for the work he had done, he at last transferred it to the company, who not only prospered, but, in course of time, the line, which was entirely on brick arches, required widening, the execution of which was let to another well-known and more modern extensive contractor. In the course of the progress of the work, the engineer in charge complained of the bad quality of the brickwork; but the contractor, pointing to the old work, said, "Mine is better than that"; to which he received for answer—"The contractor who did that work *paid himself*, but I have the money ready to pay you, and I must insist, therefore, on its quality being unexceptional." This anecdote is given to show that the necessity for continuing work, in the absence of legitimate funds to pay for it, led to a practical abandonment of the proper engineering control. This was the period, however, when work was being done in an improper manner, and may be regarded as the beginning of the demoralisation of the workman, who became the tool of the rapacious middleman, who, in his rapid race for wealth, became heedless of the quality of his work, so long as it was profitable. The legacy of this recklessness was to modern builders a most damaging one; for it resulted, as we hope to show in this discussion of the mortar question, in the present lamentable disregard of the quality of building materials in general, and the lime and sand in particular. It was at or about this period that the advent of the mortar-mill took place, which practically added to the opportunities of disguising the quality of the mortar, while it professed to add to its value. The subletting of brickwork—the materials being supplied by the contractor—by the rod or yard, completed the debasement of the work so carelessly controlled; the selected workman, who in his turn became a sub-contractor, disregarded thickness of joints, quality of brick or mortar, so long as he could speedily *throw* it together, and raising the biggest heap in the shortest time, was his first and indeed only study.

The primary duty required of mortar, whatever may be its quality, is to connect together bricks or stones, and the amount of it used for that purpose need not be very great. Indeed, when large blocks of stone are used, and when the required amount of accuracy is bestowed on the dress of their beds, the mortar may be simply regarded as a cushion in which is dissipated the pressure caused by the weight of the block. In ancient masonry, such as that which was employed in the building of the city of Jerusalem, the joints were so thin that with difficulty a knife could be thrust into them, and in many other ruins of antiquity the stability of the building was dependent on the faultless character of the stone dressing, without reference to the bedding joint of mortar. We had in London a few years ago, a good illustration of the effects of pressure from large blocks in the case of the bridge over Farringdon-street, carrying the Holborn Viaduct. The beautiful granite columns or piers, from the Island of Mull, showed indications of fracture, and it was found, after considerable discussion and altercation amongst experts, that the damaging influence was due to the absence of a cushion, or interposing elastic substance between the joints, which would have dispersed and nullified the vertical thrust of the hard crystalline surfaces against each other. Sheet-lead was used, and the remedy, an easy and simple one, overcame the difficulty, and succeeded in maintaining the integrity of a structure of which the City authorities and their engineers may well be proud.

Thickness of joints, especially in brickwork, has always been a matter of discussion, and ofttimes of dispute, between architect and builder, and while the one contended for a thin joint as more becoming to the elevation of his design, the other, regardless of appearance, and limiting his vision to the profit point, made the mortar-joints as thick as the supervising authority (sometimes, we fear, not over-vigilant) would allow. Specifications prescribing that so many courses of brickwork should measure so many inches had not much deterrent influence in controlling the character of the work, and now mortar-joints may be said to be of divers thicknesses, as well as qualities. Mortar of the usual kind is not expensive, and the thick joints, while facilitating the laying of the bricks, provides a system of handling by the workmen not at all calculated to improve the appearance of the work, or add to its stability. A brick is easily laid in a soft *mess*, for the bricklayer almost throws it down, and finishes its imbedment by an artful blow from the handle of his trowel, which is followed by an equally effective stroke of the trowel-blade along the joints, completing, in a shorter time than we have taken to describe it, the laying of a brick.

(*To be continued.*)

NEW BUILDINGS IN WESTMINSTER.

PROBABLY at no other period within the present century have greater opportunities presented themselves for improved street architecture than now. In the locality of which Covent Garden is the centre, several plots of building land are being cleared of the débris of old houses, and new houses are in progress. We lately referred to improvements that have been going on in many parts of Bloomsbury, between Oxford-street on the south, and Euston-road on the north. On the south side of Oxford-street, the Metropolitan Board of Works have been equally active in removing old nests of dwellings. In Henrietta-street, a very eligible plot, recently occupied by eight houses, has been cleared for building, and on the opposite side of the road, between Bedford-street and Bedfordbury, a much larger area has been opened by the contemplated street-widening, and new buildings are already in progress. Those two streets and Chandos-street bounded a triangular area of dilapidated houses and tenements which were a disgrace to the locality, since at least the tide of fashion has set in another direction. In the 18th century we read of the district of St. Giles being a wealthy and populous parish ; it had perhaps a greater reputation for its heterogeneous population of beggars. A few of the houses exhibit traces, in all their squalor, of better days ; and in Bedfordbury, a particularly squalid-looking street, there are to be seen two or three old red brick houses of good design and workmanship. Near the Chandos-street end we come across a red brickfront of exceptional good quality, having a richly-moulded cut-brick cornice, and other carved brickwork, and an interesting specimen of an old stack-pipe head. The house has clearly seen better days. But we pass on to the neighbourhood of Leicester-square, remarking, by the way, that the block of houses between St. Martin's-lane and Castle-street might also be much improved by a better approach at the back of the National Gallery, by making the road form a considerable detour at this point. Leicester-square, long famous for its foreign settlers, has acquired an almost European celebrity for its panoramas and places of amusement, though we cannot call it an agreeable locality. On the north side a large building is in progress, under the well-known contractors Messrs. Cubitt, of Gray's-inn-road, intended as a panorama on a large scale. At present little is to be seen of the building except a large brick circular-ended structure, of a circus-like form, which is intended to form the picture-gallery itself, round which the painting will be fixed or wound. Its roof will be supported by straight lattice wrought-iron ribs, diminishing as they rise, and will form a kind of flat cone. Through the courtesy of Mr. Wilson, of the firm of Messrs. Cubitt, we are enabled to give our readers some idea of the architect's design which is about to be carried out. Towards the square there will be a lofty façade of Portland stone in a French Renaissance style, the main features of which will be two side entrances, a rusticated basement upon which the main stories will rest, having a centre pediment supported by fluted pilasters. The superstructure is crowned by a lofty mansard and central domical roof of exceedingly stilted proportions, on the top of which it is intended to have an electric light. The upper stories of the front building will be used for picture-galleries and other purposes. The plan shows two wide corridor entrances and hall enriched by pilasters, one as an ingress to, and the other to be used as the egress from, the building in the rear. On entering, the visitor will reach a circular raised platform or gallery in the centre of the panoramic hall, which, as we have said, is circular-ended, though on plan it forms an elongated shape, by an intermediate length of straight walling between the circular ends. Round the walls of this room the picture will be wound, occupying the whole height of the walls. The spectators, being situated in the centre, will thus be surrounded by the scenery and vault of the ceiling, and to complete the illusion the space between the spectators' gallery and the painting might be sloped away, or made to represent the foreground of the landscape. The extent of the area thus covered by canvas, and the artificial aid afforded by the imaginary ground around the spectator, illumined as the whole will be by the electric-light, will enable the visitor to realise, as far as the painter's skill will allow, the most extensive landscape or other scenery. He is at once, as it were, transported into a new world of imagination, surrounded on all sides by a vast picture. To help the illusion, the gallery is raised sufficiently to afford a visual vertical angle (altogether about 60°) above and below the horizontal line or level of the eye ; so that the painting can be seen to the best advantage, the imaginary horizontal plane on the level of the eye bounding the horizon of the scenery. By the illumination afforded by the electric light, the visitor to such an exhibition might be enabled to imagine himself transported from the miserable gloom of a London fog into the serenest atmosphere ; enjoying the scenery of Italy or the Alps. We are not aware what particular kind of scenery will be exhibited here, though we understand it will be of a general kind, and include reminiscences of recent campaigns in the East. The architect of the new buildings is M. L. Dumoulin, of Paris.

Coventry-street is at last in the hands of the Metropolitan Board of Works, and active operations are just now going on in pulling down the old houses on the south side leading into Piccadilly, and in carrying out the widening of this long-neglected thoroughfare. When these improvements are effected there will be a step at least towards the desirable communication between the Strand and the West-end, which is now very circuitous. The Haymarket remains at present the only wide leading communication between Charing Cross and Piccadilly. We find the Theatre Royal, from being a drabby-coloured building, has assumed a tone of warm-buff or Pompeian-red ; the columns of the portico and the frieze have been painted a decided red ; in addition to which, we notice the rebuilding of a few of the houses in a more substantial manner.

The Civil Service Co-operative Society are housed in new premises, which occupy a site in the Haymarket that has recently acquired some notoriety, from the contention with reference to a dangerous structure in its rear. Mr. Verity, the architect, has turned out a pleasing front, in which colour has been introduced by the use of a warm red sandstone for the facing. The style is French Renaissance. The effect of the zinc roof, with its cast metal tinsel-like ornaments to the angles and hips of centre mansard, rather spoils the architecture, which is light and characteristic. Three unequal bays, divided by flat pilasters, break up the façade. There is a central entrance, which is a wide opening (forming a vestibule to the ground floor) surrounded by jambs and lintel of polished grey granite of bold section ; above is an entresol of rather lofty proportion, and over this a series of arched windows with carved panelled soffits. The other windows are all square-headed, and the ornamentation sparingly confined to the spandrels of arches and to the carved capitals of the pilasters of the upper stories. A bold modillion cornice over the principal story divides the front, and the upper part is treated as a lofty attic. The green marble panels introduced in the heads of the entresol windows have rather a spotty effect.

In another locality, Fleet-street, we may notice more particularly than we did a few months since, a new building which has recently been completed externally, namely, Messrs. Child's Bank. Mr. J. Gibson is the architect. The façade faces the gateway of the office-block of the Law Courts, and is an imposing composition of the Corinthian order. The three-quarter columns stand on a massive rusticated basement ; they are fluted, and support a highly-enriched entablature, the ornamentation of which is not a strict following of the Classic models. Now the hoarding is down, we can judge of the effect better ; and we can speak approvingly of the general proportions and details. Mr. Gibson has been successful in finishing his order at the ends by the use of a massive pilaster coupled with the end columns. The rusticated treatment of these, and the solidity of the basement treatment, added to the massive consoled projections of the entrance-doorways, and the quiet Classic character of the recessed ashlaring and windows of the upper stories, produce a striking façade to the Strand. Just opposite we find the Corporation have inclosed a space, on the site of old Temple Bar, whereon the intended memorial is to be erected, in a style singularly at variance with the New Law Courts.

BREWERIES AND MALTINGS.[*]

WE have sometimes wondered at the paucity of published information on this subject ; but perhaps it is not strange that architects have underrated, if not despised, a class of building which pretends to satisfy little more than the mechanical requirements of the brewer. At any rate, we might have expected that the subject of brewery arrangement would have called forth more expositors than it has, when every other kind of special construction has its exponents. Messrs. Spon have just published a second edition of Mr. George Scamell's treatise on the subject, which seems to be the only practical treatise on breweries and maltings extant, and we are not surprised a second edition has been called for. The original author, a fellow of the Institute, is an authority on the subject, having been for years engaged in the engineering department of Messrs. Truman, Hanbury, and Buxton's brewery ; while Mr. Frederick Colyer, M.I.C.E., who has revised and partly rewritten the work, has spared no labour to render this edition more worthy of the acceptance of the practical brewer and architect engaged in this class of building. Many of the chapters have been completely rewritten, the list of patents has been revised, and the plant and machinery necessary for breweries of different sizes are described with fulness; but perhaps the most useful features are the plans and sections that have been specially prepared and added to this edition. Seventeen plates of plans and sections are given of breweries from 5 quarters to 160 quarters, after which a German brewery is detailed, and examples of maltings follow. Some very important advice is given by Mr. Colyer as regards site and arrangement of a brewery, which primarily depends on a water supply, though many breweries are supplied by the water companies in towns, the well-water being used for refrigerating and washing. An open and uncontaminated site is equally essential, as the odours of gasworks, &c., injure the beer; and a position on rising ground has advantages over a flat site in disposing of the section of the building, and often saving labour, though perhaps a more desirable point is the means of transport. In planning a brewery, the future extension of the plant must not be forgotten; the brewery is more economical if worked by gravitation so as to avoid pumping. "The hot-liquor back should command the mash-tun, the mash-tun the under-back and copper, the copper the hop-back, and from the hop-back the wort should flow to the coolers or receivers, and through the refrigerator to the fermenting tuns," &c.; an arrangement, however, which cannot always be commanded in large breweries. The more usual plan, says the author, "is to arrange the plant in such a way that the liquor gravitates to the hop-back; the wort is then pumped to the coolers. It is considered by most brewers better to pump the 'boiled' than the 'raw wort.'" "As a general principle," we are told, "it is desirable to have the boilers, coppers, and hop-back in a distinct building, as it keeps the brewery free from steam. The boilers should be so placed as to allow of their being removed when worn out without cutting them to pieces, so that new boilers can be taken in whole, as the work is not so sound if a boiler has to be riveted up after delivery." The north is the best aspect for the windows of tun-room, and the walls are best built hollow, so as to preserve an equal temperature; and for the same reason tile roofs are better than slates, and the tiles do not condense the vapours from the wort. The building should be well ventilated, except the malt and hop lofts: these should be as air-tight as possible. Brick or concrete arches, on iron girders, are the best floors, and concrete and asphalte are the cleanest for the cellars. Claridge's patent asphalte is recommended as the most durable, laid on Portland cement concrete. We find the author gives tables of the safe loads borne by cast-iron columns and rolled iron joists, the weight being distributed. These will be useful for reference, and a few practical hints are given respecting Portland cement, another material that deservedly enters largely into construction of breweries. The chapter on wells and water thoroughly enters into this important question, and modes of boring and sinking wells are discussed. The Diamond rock-boring process is described; and a useful part of this chapter considers the importance of collecting the rain-water from the roofs of breweries, and using it for other purposes than brewing. For washing horses and other similar purposes, rain-water is better than any other; and there can be little doubt that brewers often neglect to make provision for what otherwise must be a large waste of water. Underground tanks lined with Portland cement might be made for the storage of the rain-water so collected, and the following instruction is given as to the construction of water-tanks: "The bottom should be lined with a 2in. layer of concrete, 3 parts sand or crushed brick, to 1 of Portland cement resting upon a bottom of stones 4in. in thickness. The walls should be 9in. thick; these are formed by a mould made by having an interior frame of wood of such dimensions that there will be 9in. between the inside of it and the inside of the excavation: this space is filled with concrete. The top may be arched over, or angle-irons thrown across; clipping the walls at each side, and at 2ft. or 3ft. intervals; the spaces between are filled with concrete slabs or stones." The calculations for well excavations, the capacity of circular tanks, and the areas of roofing required to supply tanks, will be greatly facilitated by the tables and rules that are given. Speaking of cisterns, allusion is made to the fact recently investigated by M. Mocet, that the zinc of galvanised iron is attacked by water, particularly river-water, which contains a quantity of common salt and of air, and which produce carbonate and oxide of zinc; cast-iron is therefore recommended. The construction of cold-liquor backs (or tanks), the engines and boilers, chimney stacks, and various other fittings, are described in their general features, and smoke-consuming furnaces, the best of which is said to be "Juckes'," are referred to. The details of the machinery and gear form the subject of a separate chapter. Malt-mills, conveyors, hop and yeast-presses, and other apparatus, are practically discussed, into which it is unnecessary to enter here. We pass on to notice the principal features of the plans given, and let us, however, first premise that in malt-houses the area of working-floor allowed per quarter varies very much; the author says it ranges from 110ft. superficial per quarter, up to 190ft. Cement, or tile floors, are most commonly used. Generally, a malting should have the cistern and couch at one end of the floors, and the kiln at the other end, the malt being stored in a floor over, or in a building attached to the kiln. The proposed alterations in the Excise duties will probably operate to make certain modifications in construction. Let us glance over some of the plans and estimates given. Plate 1 represents a 5-quarter brewery, the plant consisting of a cast-iron cold-liquor back, hot-liquor back, malt-rolls, with hopper and screen, grist-case, self-acting mashing-machine, mash-tun, steam wort-copper, hop-back, wood cooler, refrigerator, wood fermenting tuns, well-pumps, boiler, and engine, &c., well, 30ft. deep. The estimate is £2,400. When cellarage is provided, the cost is increased; a 7-quarter brewery is shown, estimated at £4,500. Taking a 40-quarter brewery, we find the plan consists of one long rectangular building, containing malt-store at one end, the coolers at the other, and fermenting-tuns between; while a smaller rectangle is occupied by the coppers, grist-case, mash-tuns, with hoist. The cost is put at £9,500. The sections are clearly drawn, and show the roof construction, ventilators, and internal arrangement, except stairs and shafting. In most of the plans the cold-liquor back is placed to command every utensil of the brewery; the hot-liquor back is heated by a steam-coil. The malt is raised by steam-hoist, and tipped into the hopper; it then passes over the rolls to grist-case and to mash-tun, fitted with mashing-machine. The wort then passes to under-back, then to steam-copper, and, afterwards, to hop-back, over coolers, to the refrigerators. The boiler is placed in a separate building, with engine near, and the brewer's room is shown, placed on the mash-tun stage. In some of the sections, deep cellarage is provided. The plans illustrated indicate various arrangements. In a few cases the cold-liquor back forms part of the roof, and an elevator is used, which lifts the grist to the case. The tables of useful memoranda at the end render the work a compendious guide to the practical brewer and builder. No attempt is made to render the building architectural externally, and here a great deal must be left to the architect; but Mr. Colyer has supplied him with facts and the essentials of economical building.

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[*] Breweries and Maltings : their Arrangement, Construction, Machinery, and Plant. By Geo. Scamell, F.R.I.B.A. Second edition, revised and enlarged by Frederick Colyer, M. Inst. C.E. London : E. and F. N. Spon, Charing Cross.

PURITY OF WATER.

THIS subject is generally uppermost in peoples' minds after a severe drought, and during the prevalence of dry summer weather, and the statistical information that has recently been accumulated upon it is beginning to be rather formidable. The discovery of polluted sources gives rise to inquiry, but, still a large part of the suburbs of every town can show instances of polluted wells by contamination of the strata. A great deal of misconception exists still of the causes of contamination. It is not very clearly understood that wherever an impervious layer underlies a pervious stratum, and crops out somewhere in the neighbourhood, there is a gradual-flowing underground river in operation, which passes out in the form of springs at a lower level. A careful examination by boring of the sub-strata of districts proves that this water-level forms an inclined plane from the highest point to the natural outfall, and has nothing whatever to do with the natural surface of the ground. These underground rivers pursue a course along the easiest channel. Mr. Baldwin Latham has given some interesting figures of the rate of rise in various strata, by which the inclination of the water-plane can be found; and he has illustrated the effect of the rainfall at Croydon in contaminating the water. Of course, the water level is raised in wet weather, and falls when the rain is scarce. In some localities the wet weather level of the subsoil water is close to the surface, as we find it to be in many parts of London—Lambeth, for instance. The importance of the investigation of these levels is beginning to be acknowledged. In many localities supplied by deep chalk wells, the supply is found to become deteriorated during rainy seasons, and the cause is not far to seek. In dry weather, of course, the subsoil water-level being below the bottoms of cesspits and sewers, it is not contaminated; but, as soon as the level rises from rain to within reach of these sources of pollution, the water suffers. The immediate vicinity of cesspits to wells is a readily-ascertained cause of pollution, if it happens that the run of underground water is in the latter direction. Captain Galton, in a chapter on this subject, shows how fluctuating this danger may be, and he also summarises a variety of suggestions, which we may refer to here. It is stated that the London water companies have discovered that the hemp used to caulk their iron mains has injured the water; but this source of pollution may be readily overcome by the adoption of a joint we recently mentioned in this journal, which was effected by running a composition in a groove that presses as a band round the spigot-end of pipe. Water supplied from wells in porous soils is generally open to suspicion; they are, as a rule, mere surface wells, and the purity of their supply depends upon the nature of the soil through which the supply comes, and the sanitary condition of the locality. Even in deep wells, it is found that the surface water is of a different quality to the water drawn from the bottom of wells by pumping; the surface water is often polluted with organic impurities. A useful precaution in the case of surface wells in porous strata is to line the brick steining behind with puddle to the depth of well, or so far below the surface as any source of impurity is suspected. By this means the surface water cannot percolate into the well till it has been filtered through the soil. It is desirable also to pave the surface round the well upon puddle, and to drain it away and to carry up the steining of the well to form a curb, by which means surface impurities are prevented from falling in, or to cover the well entirely. Every well should have a pump, as the bucket plan of drawing is open to objection, for obvious reasons. As regards storage, it has been urged that the best position for keeping water is in tanks underground, if impervious to drainage. The water retains an even temperature, and will take up carbonic acid gas, thus rendering it palatable. In cisterns, the variation of temperature has an injurious effect, as the water absorbs noxious gases when cooled. Capt. Galton gives the following figures to show the difference between the kinds of storage:—

"Well-water was observed to have a maximum temperature of 51·5°, and a minimum temperature of 50·5°, or a mean of 51° during the year in the same locality. The water supplied from mains had a maximum temperature during the year of 64·8°, a minimum temperature of 39·7°, and a mean temperature of 52·25°, and the water in cisterns above ground varied from 71·5° maximum, to 33·60° minimum, with a mean of 52·55°. Thus, whilst the range of temperature of the well water was only ten, the range of the water in cistern was nearly 38°."

Such a great variation of temperature has a prejudicial effect upon the water, and, hence the value of placing cisterns in positions not exposed to great changes, though easy of access. As regards the overflow, or waste pipes, it is now generally admitted that they should be disconnected from the drain.

THE BRITISH ARCHÆOLOGICAL ASSOCIATION AT DEVIZES.

[FROM OUR OWN REPORTER.]

An archæological congress, such as that just closed at Devizes, is by no means the fitting occasion for patient study and quiet thinking-out of cruces; on the contrary, it is a time for the trotting-out of hobbies, a period when theories can be aired and combated, and when those whose minds have been broadened by the cursory examination of many scattered examples of the same class are brought into contact with local observers who have concentrated attention on the objects in their vicinity. Judged by this moderate standard of utility, the recent Wiltshire meeting has been one of the most successful, as it was one of the more popular, of those held by the British Archæological Association. The discussions at the places visited were well maintained, and at several of the churches and priories the quick observation of trained minds and free interchange of opinions cleared up difficult points as to the age, history, and original purpose of unusual features. As to the traces of the work of earlier races than the schoolboy's landmark, the Norman Conquest, with which the county visited abounds, not so much was done. The ante-Roman origin of the earthworks upon the hillsides was generally conceded, the coins and pottery bearing the image and superscription of the Ultramontane invaders, so frequently turned up in these camps, being assumed to indicate, not formation, but utilisation, of defences. The controversies at Avebury and Stonehenge were particularly interesting, although inconclusive. At the former place, Mr. James Fergusson's theories of a comparatively modern origin for these rude earthworks and erected stones were severely handled, it being shown that, in the case of Silbury Hill, Mr. Fergusson was palpably in error, for when he accepted the challenge of the Wilts Archæological Society to excavate this mound it was established to the satisfaction of his opponents that the undisputedly Roman road between Bath and Marlborough, the Via Julia, makes a bee-line to the hill for a considerable distance, but deviates, and always has deviated, to the south to avoid cutting through it, showing hat at least this mound of made earth is older han the still-existing road mentioned by Anoninus, the stations upon which can nearly all be identified. At Stonehenge some curious hypotheses were broached, including the remarkable supposition by a leading official of the Association, and an F.S.A. to boot, that the stones were originally inclosed in a sepulchral barrow which had been washed away by the rainfall, a theory requiring for its maintenance that the made earth should all have been removed by storms and showers, yet that the bases of the immense stones should be left unmoved and unexposed in the low natural mound. The only generally agreed-on points were that Stonehenge was more recent than Avebury, that its stones, which are of different strata from various localities, were set up at times separated by an interval from each other, and that in all probability the small unhewn stones were the first brought to the hillock. That it was set up for sun-worship seemed well supported until Mr. Cunnington mentioned the awkward fact that the line of view of the sun at the summer solstice from the altar stone to the Friar's Heel, on which the theory was based, must have been interrupted by a stone which has fallen only within recent memory. It was obviously impossible for a miscellaneous assembly like an Archæological Association, numbering a goodly proportion of mere tourists, to devote the requisite time to an examination of a barrow, so none of the numerous examples seen were opened. This omission was, however, of little moment, as their use and character are now so well known that the nature of the contents and their position can be fairly predicted before exploration. Visits to two palatial mansions, each, by a coincidence, the seat of a marquis, afforded agreeable breaks in the week's work; entirely diverse as the houses and their contents were, each presented special features of attraction; the undulating landscape-gardens and gallery of paintings at Bowood, with Adams's 18th-century Classic range of buildings, being balanced by the statelier Early Renaissance of Longleat, its modern decorations, its furniture and library. The papers read at the evening meetings at Devizes Town Hall were not equal in research and style to those of some previous years, and the daily excursions were so long and full of interest that not much energy could be thrown into indoor discussions. The chief value of the Congress will be the quickening of local thought about, and appreciation of, the antiquities of the district, leading to their more careful preservation from destruction or injury, and a desire to investigate their character and meaning. As a whole, the proceedings have passed off well, a result to which fair weather contributed, but largely due to the excellent organisation of the local secretaries, Messrs. Reynolds and Butcher, the latter of whom, in conjunction with Mr. E. Kite, brought out a reliable pamphlet, "Historical Notes," on the principal places visited. The Association has never had a local president who exerted himself more heartily or more genially than Lord Nelson has done, and the title of "our hard-working president" was no empty compliment. But we must proceed from a general survey to a journal of the Congress proceedings, resuming our narrative at the point to which it was brought in our last issue.

THURSDAY.

This was one of the most popular excursions of the Congress, Bradenstoke Priory and Malmesbury Abbey being the chief features of the day's programme. Over one hundred ladies and gentlemen left Devizes station at 8.30 by special train for Chippenham, where waggonnettes were in waiting. *Langley Burrell Church*, the first place visited, is still bepewed and unrestored; the oldest part is a north arcade, carried by low circular piers with bold Transitional foliage; the aisle itself is a 15th-century reconstruction. Other distinctive features are a groined south porch, with charming grille to window lighting an upper chamber, and a panel carved with crucifix high up in eastern wall. Exposed outside the south porch, loosely propped against the wall, is a tomb-slab of stone carved with effigies, presumably of a Cobham and his wife; this it was suggested could, and ought to be, protected from the weather at a cost of a few shillings. The church at *Draycott Cerne*, closely adjoining on east and in line with the Classic residence now inhabited by Earl Cowley, has been considerably restored. In the large chancel, which is lower than the nave, owing, as Mr. Ewan Christian suggested, to slight fall of site, is a brass with effigies of Sir Edward Cerne, who died in 1393, clad in chain mail, and his second wife; and on the south wall are hung two ancient bascinets, a pair of gauntlets, and short sword. These, and a tattered flag, were suspended by members of the Long family, and opposite it is a 14th-century founder's tomb, with numerous mouldings and closely-set crocketing. Mr. Loftus Brock expressed regret that the old font was now set in the manor house garden, just under the east window of the church, . and was used as a garden-pot! (A somewhat similar desecration had been seen, but escaped comment, on Tuesday, in a garden at Tinhead, near Edington, where is a fine 13th-century font, with trefoil arcading on the rim; this was taken from Great Cheverell Church during a recent restoration, and a tame modern Perpendicular font substituted). *Sutton Benger Church*, next visited, has a south aisle of a better type of the Late Decorated style than is common in the district; the aisle windows are filled with flowing tracery, the five-light eastern one being of a florid reticulated character, and adorned with the ball-flower on the mouldings both within and without. In the central lower panel of this window was, on the inner side, a rich canopy of tabernacle work, once filled by a statuette, while the other blank east face of this panel was carved with a fair reproduction, in miniature, of the window itself, but less depressed in tracery, and with the addition of stiff pinnacles; we say *was*, for in the recent restoration of the church this unique feature has, for some reason, been replaced by a modern and inaccurate copy; a figure of Our Saviour being erected inside the new canopy, while the old outer panel is placed for the present against the east wall of aisle, showing the deviation occasioned in recutting. The alteration aroused some severe criticism. Over the reading-desk is thrown an altar-cloth or hearse-cloth, embroidered with rows of kneeling female figures.

BRADENSTOKE PRIORY.

This Priory, unlike most, is set on the edge of a steep hill commanding a wide view to the west and north-west. The site is occupied as a farm, the dwelling being formed out of the "King's Lodgings" and the guest-house, a 14th-century structure, in tolerably perfect condition, the post-Reformation floors and stairs, with which the great hall is cut up, being the weakest points. It lies nearly north and south. The undercroft, now cellarage, has been little tampered with, and is vaulted with quadripartite vaulting, carried on short columns; over this is the great hall, now divided into rooms and additional floors added, but still preserving externally, especially on the west face, its old appearance, between the buttresses being a series of unusually long Decorated windows. From the garrets can be explored the open roof, with ball-flowers on the tie-beams, figured in Rickman's "Architecture," and in one of the old rooms is a carved and painted stone chimney-piece, crowned by a cornice of foliage and central bracket, and almost contemporary in date with the chief features. At the north end of the building is a garderobe turret, approached by a corner staircase. The buttresses of the west wall are connected by a series of semicircular voussoirs, with plain walling above, set 15ft. or so from the ground, and quite 18in. from the wall. These evidently Late Norman remains suggested a puzzle till it was explained by Mr. Brock that the stones had been brought from another portion of the site in 1732. On the hill-slope facing this front, Mr. Brock read a paper on the Priory, in which he introduced his subject by a glance at the distribution of the monastic orders in Wiltshire, which was singularly varied. The Benedictines had but few houses in the county, the Cistercians and Cluniacs but one each, and the obscure Bonhommes and Gilbertines were represented by one and two foundations. The friars of later origin, elsewhere so numerous, the white and grey, had but one house each, and the black friars but two, while there were seven alien houses. In Wilts there were six houses of Austin Canons, of which Lacock Nunnery, to be seen on Saturday, was one, and Bradenstoke the principal and most wealthy. Its importance could be judged from the fact that at the Dissolution it was returned as valued at £212 19s. 3d. in the clear, while the neighbouring priory of Keynsham, Gloucestershire, was given as £419 14s. 3d., and Malmesbury as £803 17s. 7d.

The relative value of money might be noted from the certificate of Sir J. Seymour in 1523, that in the borough of "The Vyse," only eight persons were returned as being worth £20 per annum. The number of the occupants of Bradenstoke at the Dissolution was the prior and twelve monks (and these seem to have been chiefly aged men), the abbey of Malmesbury having 22, including the prior and sub-prior. Search through the old chronicles had given few other facts as to the Priory, except its founding and dissolution. It was established and endowed by Walter d'Eureux and De Saresbiria, A.D. 1142, to the honour of the Blessed Virgin and for his soul's health. After the death of his lady, Walter took the religious habit (but did not seem to have become prior), and at his death he was buried by her side. Bradenstoke was the favourite burying-place of the founder's family until the establishment of Lacock Nunnery. In the pages of Dugdale would be found the names of six of the priors, and notices of the seal, inmates, income, pensions, and principal charters. Two cartularies of the priory yet existed. One had passed from the Stowe Collection to the Library of Lord Sherborne. A second, in the British Museum, was a volume damaged by the fire at Westminster, 1731, but it was readable, and had been carefully bound. It gave minute reference to the property held by the Priory, and abounded with curious particulars as to tenure, &c. It was a work of local interest that might well be published by the Wiltshire Society. The charter of Henry III. to St. Peter's, Gloucester, was dated from Bradenstoke, A.D. 1235, and indicated the presence of the king at the Priory at that date. Aubrey, in his "Natural History of Wilts," described the ruins of the priory as they were in 1666, when, he said, the church had been destroyed and the foundations dug up. Mr. Brock, however, conjectured the latter item was incorrect, and that the foundations still remained to reward a search for them. Aubrey described the hall which had been left, and said at the west (really the north) had been the King's Lodgings, which had remained till 1588. He added, that the ruins had been used as a quarry for a long period, the mansions at Broad Hinton, Bromham, and Cadnam, having been built with them. A "North View of Bradenstoke Priory," published by the Brothers Buck in 1732, represented the hall as now, with an additional building at the north end no longer existing; this was an apartment of great elegance, lighted by a 16th-century traceried window of eight lights, and having an arched door with a row of shields between it and the window. These shields had been built into the present south-east porch. The church was said to have stood to the south of the present remains, and in 1851 a pavement of encaustic tiles was found on its site 6ft. deep. This was a discovery of much interest, and ought to be followed up, for the search might result in a pavement as rich as that unearthed at Keynsham. Mr. Brock and Mr. Reynolds then described the architectural features of the building, all except the arcading now set up on the west wall-buttresses being ascribed by the former speaker to between 1320 and 1330. The whole of the conventual buildings, with the church, were placed to the south of this guest-house. Opposite, a plain Perpendicular barn, with modern roof, was seen. An entrenched mound to the north of the house was regarded by some as a barrow or encampment, allied to the one on the opposite hill, that of Chart; but Mr. Kerslake and others suggested it was merely the site of a pleasaunce and a fishpond in the monks' garden. Subsequently, Mr. Goldney stated that his father, Sir Gabriel Goldney, and he had determined not to allow the Priory to be restored in their time, but simply to preserve it. Mr. Brock commended the prudence of this course, but referred to the interesting revelations that might be anticipated from an excavation of the pavement and site of the former church. Rejoining the carriages at the foot of Bradenstoke hill at Dauntsey, a long drive was made to

MALMESBURY.

Here Mr. W. Powell, M.P., had provided a sumptuous luncheon in the new reading-rooms he has built and furnished for the townspeople. This having been done justice to, the *Market Cross* was visited. It is a Late Perpendicular structure, very similar to those at Salisbury and Chichester, and is a stone canopy borne upon eight pillars. A deeply-moulded flying buttress rises from each pier, clear of the richly-groined roof, the light ribs being drawn into a cluster by a wide string-band supporting a large pinnacle and ogee finial. This pinnacle bears traces of sculptured figures, and, on the west face, of a crucifix; but the faces of the work are much abraded by weather and, perhaps, rough treatment, for most of the bosses have been broken from the groined vault. It was erected for the shelter of the market folk in 1490. Passing through a large stone archway into the churchyard, the grand south façade of the *Abbey Church* was seen in all its beauty. Of the original cruciform structure—once, like Ely, adorned by a lofty central spire, and another at the west end—but two-thirds, the eastern portion, of nave and a magnificent south porch remain. The south front shows a Transitional Norman shell, with a clerestory and most of the aisle lights filled with Decorated windows, with large flying buttresses and pinnacles. A flowing pierced parapet is carried above the clerestory, the aisle and porch. The roof is a modern one, of slates, resting on deal timbers of poor scantling set upon the 14th-century stone vaulting. East and west are ragged fragments of the former extensions. The south porch is the richest feature; it is Transitional, of eight deep orders, of which three are filled with sculptured groups, and the others with interlaced ornament. The inner doorway is almost equally rich, and in the tympanum and on the walls are bas-reliefs of the "Majesty" and the "Apostles." Flanking this porch, on the east side, the visitors were shocked to find a too-"public convenience," which, as an incongruous indecency, ought to be summarily removed. The interior forms a noble church, wherein massive cylindrical piers, with scalloped capitals, and a large triforium, all of Transitional character, lead up to a large Decorated clerestory and a groined roof of the same period. The aisles retain their Norman groining and a few Norman windows, and have Perpendicular screens at the eastern ends. In the regretted absence of Mr. Thomas Blashill, Mr. George Patrick read some historical "Notes" on the abbey, and conducted the visitors over it. Turning to the building before them, he said no traces of the Saxon abbey could be found, and it was probably of wood. Britton, in his "Antiquities," refers to a deed of Malmesbury of the time of King Edgar, in which allusion is made to the generally ruined and deserted condition of the buildings; but such a deed cannot now be found. The arches and existing remains are not of prior date to 1160 or 1170. Porches were not common in the Transition style of that period, and the south porch before them was almost unique for its exceeding richness and magnificence of ornament; the subjects of the sculptures were taken from the Old and New Testaments. This porch was enlarged in the Perpendicular period by the addition of an outer casing to the walls. The windows of the clerestory were altered to the Decorated style about 1350-60, and no traces of Norman work exist internally above the level of triforium excepting the great arches of central tower. The pinnacles and the flying buttresses were of the 14th century. The door on the north side, leading to the cloisters, was Norman, but had had another inserted within it in the 14th century; and to the latter period might be referred the north aisle windows and the lofty west window. Within the abbey, attention was called to the contrast between the 12th and 14th century work, to the excellence of tracery in the eastern screens to aisles, to the quadripartite vaulting, and to the Perpendicular watching-chamber projecting from one of the triforium arches on the south side. Both the grand towers had fallen—that at the intersection of transepts, which probably contained the large peal of bells, and which fell in Henry VIII.'s reign, and a second, chiefly of 14th century character, which also came down in Charles II.'s time. Mr. Brock said the history of these towers was a warning to ambitious people; their ruins were evidently due to successive additions to their height and the building of lofty spires, first on the central and then on the western steeples, whereas the existing remains showed that no attempt was made to strengthen the foundations. The central tower was one of the small class, broader on the east and west faces than on those north and south; a glance at the remaining north-east fragment would show that instead of attempting pointed arches on the narrow sides, as in the similar example at St. John's, Devizes, the circular soffits were brought to equal heights by stilting the transept openings. On this weak erection once stood one of the highest spires in England, and in it a heavy peal of bells was hung. A question having arisen as to the purpose of a peculiar series of large circular medallions or rosettes of flat ornament between the clerestory windows on the eastern portions, both on the north and south sides, Mr. Ewan Christian said they indicated that a Norman clerestory was at least commenced, and replaced in the 14th century by the present rather poor windows, proving his point by showing that one or two of these rosettes formed springers of semicircular arches. Mr. John Reynolds, of Redlands, Bristol, explained the situation of the conventual buildings, which have entirely disappeared, the site being a piece of pasture and a private garden, showing that a plain unpierced wall, with deep string-course above the nave, was clear evidence of the south walk of the cloisters. There were two entrances into the nave, both of which are distinctly marked, although now walled up. On the return east side next the north transept was the chapter-house, and next to it the day-room, overhead being the dormitory, which had a doorway into church, for the use of the monks who had the night services to perform. On the north side was the refectory, and on the west a second day-room for lay brethren or students, but its exact use was controverted.*

Dr. Jennings' residence, Abbey House, built in the 16th century, on the site of some of the conventual buildings, was then visited. What are now the cellars are a series of vaulted chambers, with Decorated window tracery and groining, corresponding with the great works of rebuilding in the abbey church. The windows are, as Mr. Christian showed, deeply splayed inside on a curve, the surface being rendered to a true face in cement. The columns are almost buried in *débris*, but excavations show them to be 9ft. from base to capital. A central range has been destroyed. The similarity of the work to Bradenstoke is very marked. Dr. Jennings suggested that this was a second cloister, others that it was an undercroft, but Messrs. Christian and Reynolds agreed that it was too important for the latter, while the former hypothesis could not be supported: it must have formed the great hall of the abbot's house, and at that time was, of course, above ground. In the upper part of the house is much good 17th-century panelling and carved oak furniture, including a large Jacobean four-post bedstead, richly treated in Classic style, but having as a foot-board a pierced undercut panel, French Flamboyant in style, and bearing upon it the arms of France impaled with those of Brittany, and the dolphin, the well-known badge of the Dauphins, which the Rev. Mr. Elliott showed indicated that this fragment of carving was originally worked for Charles VII. of France, who married the heiress of the Dukes of Brittany. The staircase to the upper part of house is of solid block oak, with solid oak newel. Dr. Jennings conducted the members over the eastern limb of the abbey church, which he has inclosed, and had excavated a few years since, when he found nothing but the concrete foundations of the choir and transepts, and the square flue, with soot still in it, running along the north side, by which the building was warmed. All the worked stone, with the exception of a coffin, which he left *in situ*, had been quarried away.

In the evening two papers were read, the first by Mr. Morgan, F.S.A., on "The Gewissens (or Westerners) in Wiltshire"; the second by Dr. Phené, F.S.A., F.G.S., on "Existing Analogues to Stonehenge and Avebury." The author claimed that he had discovered in the Balearic Islands in the Mediterranean the only examples of the mortise and tenon system of Stonehenge in structures which assume "the precise condition of the more vast portion of Stonehenge." All the features of Stonehenge (he said) have analogues in the "islands between the African continent and Europe." These structures, he was led to believe, were Roman, and his impression was "that as the Romans consolidated their power by alliance with, and granting freedom to, the nobles of the countries they governed; as they considered the worship of the local deities of other lands meritorious, and no abrogation of, or detraction from, the honours claimed by their own deities of Rome, they could show this in no more comprehensive way than by restoration or augmentation of that temple in Britain, which was in the centre of the deceased nobility of the land, and in the vicinity of what was clearly the great wardmote or gathering-place of the British at Avebury." A discussion ensued, in which Mr. Picton and others took part. Mr. W. Cunnington pointed out that the most extraordinary thing in connection with Stonehenge was the fact that there were three or four kinds of stone there, one of which it was absolutely clear did not exist in England; to which Dr. Phené replied that Mr. Fergusson saw the direct course of the stones from Africa, and he gave as an example of large stones being brought from abroad a description of a piece of Assyrian sculpture, which, he said, had been dug up on the estate of Lord Mount Edgecumbe.

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* In the Building News for Sept. 22, 1876, will be found plans of both Malmesbury and Lacock Abbeys and their conventual buildings, by the Rev. E. C. Mackenzie Walcott, together with descriptive notes.

FRIDAY.

A drive of forty miles to and from Amesbury and Stonehenge was the programme for the day. In the latter part of the day, at Vespasian's Camp and Stonehenge, the members of the Archæological Association were met by the Newbury District Field Club, the combined party numbering about 200. On the outward journey the route taken was along the Valley of the Avon, two of the village churches being examined. The first of these, *Endford* or *Avonford Church*, is a building altered to its present condition after the crushing of the nave by the fall of the spire in 1817. It has a range of blank arcading of slender lancets, on the north side of chancel, and opening out of this a low octagonal chamber now used as a vestry, and having in the angles four aumbries, in which hooks still remain. This adjunct, which has been a crux to local antiquaries, was pronounced by Mr. Brock to be the base of a proposed north-east 13th-century tower, and utilised from early times as a sacristy. The church of *Nether Avon* has a remarkable west portal, of very rude and early character. Two pilasters, with cushioned caps roughly sculptured, the one with a lion, the other with an ape, or some other quadruped, carry a plain circular soffit and arch of great depth; the north and south sides of this stage of tower are panelled with flint and stone, and have small Norman doorways, now walled up. The internal arch is of like character, and also has wide joints; the nave has Late Transitional piers and arcades. Mr. Brock suggested that this west doorway was once internal, and formed the central tower of an aisleless church, apparently of the latter portion of the 11th century; an opinion in which Mr. Picton coincided.

AMESBURY PRIORY CHURCH.

This church is a large cruciform structure, with low square central tower, from which a spire was demolished in 1540. The walls of the nave are Norman with inserted windows, but the other limbs were rebuilt and enlarged in the 13th century. The upper part of tower is considerably later, and Decorated windows are inserted into the chancel between the lancets. The roof of nave is a good example of hammer-beam construction, with ornamented tie-beams and braces. There is a Late south aisle, and opening from the north transept is a chantry chapel, with an excellent two-light window in east gable, divided by a shaft with foliage cap, c. 1340. Mr. Brock gave an account of Amesbury Priory, founded in 880 by Queen Elfrida, as a Benedictine nunnery, and which grew to be one of great magnificence. At the suppression of monasteries almost all the conventual buildings were destroyed. It was clear that this was the conventual as well as the parish-church, for on the north wall is a corbel-table marking the old cloister roof and the walled-up doorways, while at the east end were traces of other buildings having existed against north transept. He expressed regret that in the restoration effected in 1853 [under Mr. Butterfield] the rood-screen and an east window of Henry VII.'s time were removed, the latter to make way for a modern conception supposed to be in character with the earliest part of fabric, for in this work a link of the church's history was destroyed. Some discussion took place as to the want of symmetry in plan. The chancel leans considerably to north, and the west wall of nave is set askew, but no satisfactory explanation was offered, instances of leaning, both to south and north, being mentioned; and in reply to the theory that the inclination indicated the rising of the sun on the day of founding, Mr. Brock said, an inexplicable fact was, that in no one case where the day of founding was known did the inclined axis exactly correspond with the sun's position.

After luncheon, the visitors walked through the park, beside the site of the nunnery, and past the seat of Sir E. Antrobus, said to have been built from the designs of Inigo Jones by his son-in-law, Webb, to the earthworks, called by Dr. Stukeley, and on the Ordnance Survey, "*Vespasian's Camp.*" These ramparts follow the contour of a hill-side overlooking the Avon, and are on plan an elliptic curve, with closed end, containing an area of 39 acres, and commanding the river and opposite bank; they are formed by a vallum with outer ditch, but are much obscured and broken by the planting of trees and the formation of pleasure-grounds upon them. Lord Nelson pointed out the resemblance to Bratton Camp, allowing for the existence of a river here, and suggested a common origin. Mr. Brock said these earthworks had been much misunderstood. This camp was certainly used by the Romans, as a few of their coins found on the site proved, but here and elsewhere they simply utilised works already existing, formed by the Britons, not as mere military stations, nor yet burial places, but as oppida—lines of defence on the hill-tops, within which they erected their wigwams of branches or dug out pits, and folded their cattle at night. They followed every contour of the ground in their trenches and banks, and where a river was not at hand, probably got water as the shepherds on the Downs did now, by puddled "dew ponds" at the lowest point of camps, in which the rainfall was stored. These entrenchments were sometimes used by a later race for sepulchres, but the new layers of the burrows were often perceptible. The members proceeded, after some discussion, to

STONEHENGE,

gathering within the inner circle to listen to the reading of papers by members of the two societies. Stonehenge is too well known to need more than an outline of description. It occupies the swelling surface of an elevated portion of Salisbury Plain, but by no means one of the highest eminences within a short distance. Inclosing an area of 360ft. diameter is a slight bank and outer vallum, with entrance on north-east. Within this space is what appears at first sight to be a confused group of large stones, of several kinds, sizes, and forms, some erect, a few leaning, and others fallen, but all fissured and weather-worn, and clothed with lichens and mosses. Segments of an outer circle of squared stones are standing upright—stones 16ft. high—at a distance of about 3ft. apart, and connected by a series of imposts, mortised by large holes on the under side into a projecting knob on each upright, and dovetailed into each other. Within this are a few unhewn obeliscal stones, about 4ft. high, and within this again two perfect trilithons, one fallen one, and two uprights of other lintel-like erections of the largest stones in the group, and forming the west part of a grand ellipse. There is an inner ellipse of obelisks, very irregular and incomplete, and in the centre is a large flat stone, called the "altar stone," but which has apparently fallen. There are three stones on the inner edge of the inclosure, and just outside on the N.E., in the line of entrance to the rampart, is a large leaning stone called the Friar's Heel, which was frequently alluded to during the afternoon. Standing upon a fallen stone, which served as rostrum to the successive speakers, Lord Nelson pleaded for the conservation of Stonehenge, by setting upright a now prostrate trilithon on the western side, known to have fallen in 1797, and by pushing back and securing one of the two large single stones of the inner ellipse, which now leans threateningly upon an inner obelisk, and must, if not seen to, fall within a short time. The exact position and appearance of the fallen trilithon are known, and the restoration could be effected without risk by present mechanical appliances. He then introduced Mr. William Cunnington, F.S.A., who delivered an opening address, every stone having been lettered in chalk by the speaker to facilitate identification during description. The largest stones were "Sarsens," boulders which, ages since, were deposited as sand above the chalk deposits, were formed by the agglutinising of some particles into silicious sandstones, and were exposed when the looser portions were washed away. These sarsens were found in some of the Wiltshire valleys on the Marlborough Downs. The obelisks were smaller, and of two varieties of stone, one a hornstone and the other "diatose" (the latter a scarcely accurate term) both igneous rocks, but neither of which could be found in England or Wales. These were all grey, of various shades, but the middle or altar stone was black, and was a micaceous sandstone, possibly derived from the coal-measures in the neighbourhood of Frome. Having minutely distinguished the varieties of stone, Mr. Cunnington showed a model of Stonehenge, as now, and as supposed to have appeared when perfect, showing that there was then probably an outer earthwork, as now, and inside this a ring of mortised and tenoned stones, all joined at the top like the few now standing, then a circle of posts or low obelisks, a horseshoe of trilithons, and an internal horseshoe of obelisks. In the construction of this group, whatever its purpose, a high mechanical knowledge and very great skill were displayed, the more surprising since it was probably done without the use of iron tools. Constructive ability was shown not alone in the transport and setting up of these huge stones, but in the system of mortise and tenon and dovetailing employed to secure the transverse slabs, a method of securing which the speaker illustrated with small wooden blocks. Mr. Wright asked if the cross stones of the trilithons had not been displaced and set up again, and Mr. Cunnington and local gentlemen said this was not true. A general laugh greeted the question "To what date do you attribute the work of erection"? to which no reply was given. Mr. T. Morgan, F.S.A., read a paper on the etymology of the name, which had been conjecturally derived from Hengist, hanging, or leaning and suspended stones, and stones of hanging, or gibbets. He favoured the opinion of Sir John Lubbock, that it was derived from the Saxon stane-ing or field of stones, and nothing would be more appropriate, standing as it did in the midst of an acropolis of some 300 barrows. As to its object, it neither resembled a cromlech, temple, nor place of worship, but partook of the characteristics of all these. One plausible view was Mr. Lucas's, who maintained that they were simply burial-places denuded of earth by the washing away of the soil; it certainly resembled the Mag's house in the Orkneys, which was a real cromlech. He believed all the kinds of stones might be found in Wales, or perhaps in Ireland. A French writer had pointed out the analogy between Stonehenge and many Temples of the Sun, especially those at Baalbek and Mârtund, in Cashmere, and he was disposed to believe that this was intended for sun worship, without committing himself to any date, although all from King David, to Druids, Romans, and even Saxons, had been named. Prof. Rupert Jones, F.R.S., read a paper written by Mr. T. Claxton Fidler, M.I.C.E., of Cork, on the Astronomical Theories as to Stonehenge. The author detailed trigonometrical co-ordinate surveys and mathematical calculations made by himself and two other engineers, during a week spent at Stonehenge, and stated that the result, after allowing corrections for the apparent, as distinguished from the true, horizon and position of sun, and also for the cyclical change in the obliquality of the ellipse, proved that the Friar's Heel is so situated, and the axis and centre of the building are so arranged as to mark the rising of the sun at the summer solstice. The priest at the altar, situated in the apsidal end of the horseshoe, or a worshipper in the centre of the circle, would see the sun rising out of the Friar's Heel stone. As this arrangement, if a mere coincidence, had a range of probabilities of 1,400 to 1 against the Friar's Heel being pitched within the earthworks within a semidiameter of the correct position, the theory that Stonehenge was a temple for sun-worship was, in the author's opinion, established by the result of his observations. In this theory Professor Jones and subsequent speakers concurred. Mr. Walter Money, F.S.A., of Newbury, followed with a paper, referring in his introductory remarks to his explorations of Wiltshire barrows, in conjunction with Canon Greenwell. He had very little doubt that Stonehenge belonged to the Bronze Age, a view in which he believed Sir John Lubbock concurred. The age could only be fixed approximately, but if they considered that the use of iron was known in Britain at the time of Julius Cæsar's invasion of the country, B.C. 55, and that its introduction might be roughly assigned to two or three centuries before Christ, a starting-point was provided. The use of bronze must have lasted over a considerable time, and, allowing 700 years for its use as the metal of cutting instruments in Britain, the age of its introduction would be about 1000 B.C. When at Stonehenge with the Wiltshire Society a few years ago, he was struck by its comparison by Mr. J. H. Parker to Gilgal; and since then he had seen this theory advocated by an anonymous writer of a pamphlet on "Identity of the Religions called Druid and Hebrew," published by Blackwood, in 1829, in which some very remarkable arguments were adduced in support of the theory that this was a Druidical temple of Early British times, similar in character to the temples frequently mentioned in the Old Testament. The most ancient account of a temple was in Exodus xxiv. 4:—"And Moses rose up early in the morning and builded an altar under the hill, and twelve pillars, according to the twelve tribes." Having quoted from the Pentateuch, Joshua, Judges, Zephaniah, Tacitus, and Epiphanius, to show the earliest modes of worship by erecting stones in the open air, Mr. Money urged that there was no proof that the stone circles described in the Old Testament were not erections of the heathen possessors of Canaan. No covered temple was, however, built in the land till the days of Solomon. Stones were the simplest materials, and circles the simplest form in which to arrange them; and these circles were the memorials of great events, the meeting-places of armies, the burial-places of chieftains, and were regarded as sacred spots. The stones here were arranged exactly like the description of the Jews. Its appearance proclaimed the antiquity of Stonehenge, but its magnitude and grandeur declared that the people who first raised the ponderous blocks of stone of which it was composed were not so rude and uneducated as had been conceived. In Ireland, as well as in England, a vast number of these circles existed; but it was in Scotland where they were discovered in the finest preservation. In France, and on the Continent generally, they were to be found, and it must be supposed that they were used for the same purposes in Europe as in Asia. He believed, notwithstanding possible ridicule, that Stonehenge and like structures were used for worship by the Druids. As to the mode of construction, he saw no difficulty in supposing that these colossal blocks of stone were brought from the neighbourhood of Marlborough, and transported and set up by enslaved manual labour. Mr. Myers, F.S.A., urged the higher antiquity of Avebury over Stonehenge, from its greater rudeness. Stonehenge could not have been, as Mr. Morgan suggested, a group of unearthed cromlechs; none of those in Brittany, Cornwall, or Ireland had any approximation to this. As to its being a temple of the sun, it was absurd to compare it to Baalbek, now a fragment of six Corinthian pillars connected by a well designed cornice of great depth; Baalbek was one of the most beautiful and refined examples of Classic work, and far surpassed anything in Rome. Mr. Taylor, of Clifton, added that Mârtund was equally unlike Stonehenge; it was a circular shrine, of which the dome had fallen in. Professor Rupert Jones, Lord Nelson, and others having discussed the possible derivation of the name, as to which no theory found acceptance by any other than the propounder, Mr. J. A. Picton, F.S.A., said the coincidence between the position of the Friar's Heel and the altar stone and the position of the sun at the summer solstice was so marked that it might be taken as an accepted theory that the object of this erection was sun-worship. He would try to deal with Stonehenge without any pre-conceived theory, and, discarding all traditions, would simply examine the facts. He saw before him certain phenomena and facts, and asked what inference did they lead to. Before him were parts of two circles of small, irregular, round, unhewn stones, and between and outside these, other circles or parts of circles of tooled stones, squared, and provided, some with mortise holes and others with tenons. Was it not probable that the unhewn stones were the older of the two series? Elsewhere they found cromlechs and monoliths, everywhere with no history attached to them—at most a vague tradition that they were erected before the use of tools was known. At Avebury they had traces of circles of rude, large unhewn stones; here at Stonehenge were small stones of this class associated with large wrought ones. The squaring of the head of the huge leaning stone in the inner circle before them, leaving in the middle of the face a knot or tenon, and the cutting of holes in others could not be denied. This granted, how and when was it wrought? The date must be reduced to an extremely limited period. They must be posterior to unhewn stones, and the latter must be attributed to a period before the Roman invasion; he defied anyone to produce evidence of the existence of hewn stone before or at the time of the Roman conquest. These monuments could not have been so late as the Saxon conquest, for the chroniclers would have described their erection, whereas they were silent. Inigo Jones's hypothesis that Stonehenge was a Roman work had been received with laughter; he was wrong in attributing them to such a polished and cultured people as the Romans, but he might have been correct had he regarded it as a last expiring effort of the partially-civilised heathen devotees of the ancient religion to assert their faith. How were the stones wrought? It had been said on the ground that flint implements were used, but they might as well try to scrape the moon with a knife as to cut those hard sandstones with flints. Another idea was that bronze tools were used. This was not impossible, as some of the granite tombs of Egypt were carved with only bronze. The introduction of iron was comparatively recent; the Romans, before the first Punic war, employed bronze. As to the name, it could not be derived from the Celtic word "hag"—mighty, powerful—as suggested by Prof. Jones. He believed the root was the Teutonic heng, to hang, and that the Saxons, who knew nothing about them, called the trilithons stone-gallows. Mr. Cunnington replied, stating that, elaborate as the calculations quoted by Professor Jones might be, between the altar and Friar's Heel was a block now known as the "slaughtering stone," but which his grandfather, Mr. H. Cunnington, and Sir H. C. Hoare remembered as standing upright. If erect it would completely hide the view of the Friar's Heel from the altar, and thus completely disposed of an ingenious theory. Mr. Brock, in opposition to Mr. Picton and others, reasoned that the hewn stones were not subsequent in erection to the obelisks, for the scaffolding or inclined planes of earth used to erect the cross beams on the large stones would have displaced or buried the shorter stones. The work must be regarded as a whole. One of the smaller upright stones in the inner circle, that against which the upright leaned, had evidently been tooled, for it was hollowed on one side and bowed on the other. Mr. Edwards, of Avebury, said over one of the detached stones near the outer trench the sun could be seen at setting on the shortest day; but it appeared there was no proof that a stone ever existed on the raised place indicated from which to take observations. After a perambulation of the inclosure the parties separated, the members of the Association returning to Devizes by the road across the Plain, a district rapidly being transformed from open downs into arable land.

At the evening meeting, Mr. J. Tom Burgess's paper on "Devizes Castle," and the Rev. A. C. Smith's recent discovery of a stone circle south of Silbury, formed the subjects for discussion.

SATURDAY.

Bowood Hall and Lacock Abbey were the central points of this day's excursions. The *Church* at *Bromham* was the first stopping-place. The plan is unusual and disproportionate, occasioned by the addition, in the 15th century, of a large aisle, transept, and chantry, to south of a cruciform church. This chantry forms a chancel aisle, and is a gem of Late Perpendicular work; it was built by Richard Beauchamp, Lord St. Armand, and has an embattled parapet enriched with panelling and an eastern canopy, a flat panelled roof, painted and gilt with heraldic devices, and, happily, untouched by the restorer's brush. In the centre, including an altar-tomb—to Sir R. Tocotes, who died after 1492—of Purbeck marble, with recumbent effigy of alabaster, unhappily, scored all over with nobodies' names and initials, some dated so far back as 1631 and 1648. There are several canopied tombs and monuments to the families of the Beauchamps and Bayntons, having an unusual wealth of enamelled brasses, and on the wall are three undertakers' helmets of the 16th century. The church itself, which has a fine central tower and spire, and an Early English chancel, was restored a few years since by Messrs. Carpenter and Slater. The rector, the Rev. E. B. Edgell, described the wretched state in which he found the church on coming to Bromham, the previous incumbent, who held the living for 65 years, having kept numbers of pigeons in a wooden loft, which then extended over the upper part of the chancel. In this parish, at Sloperton Cottage, lived, for the last 20 years of his life, the poet Moore, to whose memory the west window was filled last year with stained glass by Constable, of Cambridge; in the churchyard, on the north side of the chancel, is a large flat stone surrounded by a railing, inscribed to "Thomas Moore, tenderly beloved by all who knew the goodness of his heart; the poet and patriot of his country, Ireland. Born, May 28th, 1779; sank to rest, Feb. 25th, 1852, aged 72." Moore's widow and two children are buried in the same grave. In a field near Bromham, some remains of a *Roman villa* were visited, and described by Messrs. G. R. Wright and W. Cunnington. The portions uncovered consist of portions of two tesselated pavements, adjoining, slightly differing in level, the more elaborate one having a guilloche pattern executed in black, brown, grey, and red tesseræ of chalk and clay; and near by are traces of a hypocaust. The pavement has been uncovered four times at long intervals during the last century, and has been greatly injured since it was figured by Sir R. C. Hoare; indeed, when a small portion was cleared of earth a month ago, the next day the hole was found to be bare, the village-children having picked out the tesseræ. The scanty remains should be treated as a mosaic, covered with cement, and removed to the Devizes Museum; and it is to be hoped that the Wiltshire Archæological Society will undertake this work before it is too late. At *Wans House*, the supposed site of a Roman station of Verlucio, nothing was seen but the well-defined Roman-road from Bath to Marlborough.

Bowood House, the seat of the Marquis of Lansdowne, afforded an agreeable variety in the programme. The chief portion was built from a design by the Brothers Adam; the principal front, which faces south, has a large portico, carried by ten Doric columns, and in the pediment are sculptured the family arms. To the left has been added a long wing, the elevation imitated, after the fashion of the last century, from a portion of Diocletian's Palace at Spalatro. The entrance hall is paved with tesselated marble, and contains statuary and two large frescoes, representing scenes in the Trojan war. A grand staircase leads to the principal suite of apartments, wherein a couple of hours were well spent in examining the paintings, sculpture, and china. The pictures include choice examples of works of the masters of the Italian, Flemish, Spanish, and English schools, the most valuable being the one over the fireplace of the library, Raphael's "St. John the Baptist Preaching in the Wilderness," painted, in 1505, in the great master's Florentine style. There are good examples of the works of Rembrandt, Salvator Rosa, Murillo, Giorgione, Ruysdel, Teniers, Cuyp, and Jan Both; and in the English school Sir Joshua Reynolds is represented by his "Strawberry Girl," and a portrait; Hogarth by a portrait, "Peg Woffington"; Etty by a "Prodigal Son"; Turner by four misty but grandly-conceived landscapes; Stansfield by several Italian landscapes; Wilkie by two domestic scenes, photographically minute in detail; and Landseer, Cope, Newton, E. W. Cooke, and Eastlake, by characteristic works. The best of the sculptures is in the corridor, Westmacott's "Hagar in the Desert," with the dying Ishmael in her lap. The library is chiefly of modern works. The extensive grounds are laid out in an unrestrained form of landscape-gardening, advantage being taken of the nine natural valleys by thick plantations of beeches, oaks, and firs, open glades, and a lake covering 30 acres, to obtain great variety of scenery. After luncheon at the "Lansdowne Arms," Derry Hill, the party proceeded to *Lacock Abbey*, staying on the road to see the Tudor Gatehouse at Spye Park, removed from Old Bromham House; a 16th-century vaulted conduit-house on Bowden Hill;

and *Bewley Court*, a good example of a small dwellinghouse of the 15th century, with mullioned and cusped windows, four-centred porchway, the remains of an open roof, and much panelling; it was greatly altered about 80 years ago.

Here and at *Lacock Abbey*, the most interesting visit of the day, the visitors were received by Mr. C. H. Talbot, the owner and occupier of the latter building, who, in brief but appreciative terms, described the buildings, pointing out the principal features. The abbey was founded by the widowed Ela, Countess of Salisbury in her own right, for Canonesses of St. Augustine; the foundation-stone was laid in 1232, and eight years after the countess was elected as third abbess. The abbey, which obtained many grants of markets and forest and free-warren privileges, was surrendered in 1539. After the Dissolution, the site was granted to Sir William Sherington, who pulled down the church and many other buildings, and built over the cloisters and nuns' domiciles the present picturesque building. The property passed, by the marriage of his niece and heiress, to the Talbot family, and in 1645 the building was fortified for Charles I., but capitulated after a brief siege. Opposite the south, the principal front, Mr. Talbot explained the alterations carried out by Sherington, indicating on the wall the traces of the transept door, the springers of the vaulting, and other marks of north wall of former abbey church, on the site of which they were standing. This front, including the octagonal tower at south-east angle, was the work of Sherington, but the oriels were thrown out in 1828. Passing through the gateway, the visitors found themselves in an open garth. On three sides were the cloister walks, with good Perpendicular tracery and groined vaults, 7 bays on north and south sides, and 6 on east side; the west walk is gone. Mr. Talbot drew attention to the springers and ribs of 13th-century arcading built into the north wall, and showed that the two south-west bays were first re-erected by the nuns (these Transitional Decorated bays contained a fine number of masons' marks), and after a considerable pause the work was completed. Over the east walk was the nuns' dormitory, still retaining its 15th-century roof; but behind the wall were the original 13th-century sacristry, chapter-house, slype, and nuns' day-room, running in line from south to north. Over the north walk was the refectory, with four-light windows, by Sherington, in curious travesty of Gothic work, having consoles resembling cusping in the head of each light, and a circular ornament, copied from Italian palaces, at the intersections of transom and mullion; on the east side was as good an Early Renaissance double chimney as could be found in England. In this north walk were traces of the nuns' lavatory. The walling on west cut off one bay, and was part of Sherington's work, as was also much of the upper part on south. In a southern bay was an altar-tomb, said to be that of the Countess Ela, and removed by John Ivory Talbot probably from the site of the high altar of church in 1790; a cross and beads discovered in it had been figured, but could not now be found. Passing outside to the east face of the abbey, Mr. Talbot showed his visitors the northernmost conventual apartment, a large 13th-century vaulted building with central range of three pillars, and a large fireplace on west side; this had been styled the kitchen, but was, he believed, the nuns' common or day-room. Mr. Ewan Christian showed that the east front began to fail in the 15th century, when the builders erected heavy piers and threw out a flying buttress, preparing for another and larger one, which, although desirable, was never erected. The refectory and dormitory which met at this angle were rebuilt at the same time. Passing the slype, the chapter-house was seen; it is a beautiful 13th-century apartment. with groined vaulting supported on one clustered shaft, with deep neckings, and to the west an inserted and larger octagonal pier; the area is thus divided into two aisles; but at the west end, by a singular rearrangement of the vaulting ribs. three bays are made over the three entrances on this side. There is a bold string-course, except in the central north bay, and traces of frescoing above. The sacristry to the south is a similar apartment, but plainer, the string-course being omitted, and the ribs plain instead of being moulded. There are piscina and double-aumbry in south wall adjoining the trefoil-headed former entrance to church. All three apartments were glazed on the east face till the close of the last century, when that wall was destroyed. In the west wall of sacristy is a hollow space, believed to contain the staircase to nuns' dormitory, but Mr. Talbot said he should not try to open it; he had not even removed the accumulated earth over the bases of the columns as he found them so mutilated that they were best protected from damage. The old fishpond on the north was next seen, and beside it, mounted on a pedestal as an urn, is a large bell-metal cauldron removed from the nuns' day-room; it is 33in. high, holds 67 gallons, is finely modelled, with three feet and small handles, and has cast round it the inscription in Latin, "I was molten by Peter Waghuens in Malines, in the year 1500; Praise to God and Glory to Christ." There is a somewhat similar cauldron at Warwick Castle. Having seen Sherington's courtyard for stables on west side, with half-timbered dormers breaking the tiled roofs, the visitors passed into a lofty hall of same date, where refreshments were provided, and afterwards made a tour of the building, seeing in the library an interesting collection of Talbotypes, the early photographic process invented by the father of their host.

The village of Lacock is a happy hunting-ground for any artist. Almost all the houses are of the 14th, 15th, and 16th centuries, with pent-roof porches, grey-tiled roofs, here and there four-centred doorways and windows, and on one of the inns some good ironwork brackets, which formerly carried the signboard; the village cross, a Late Perpendicular structure, has been carefully re-erected by Mr. Talbot of the stones preserved in the Abbey, in accordance with a section and elevation drawn by Carter. Before leaving, the members visited, under Mr. Talbot's guidance, a large 14th-century barn, unusually irregular in plan, the timbers of each bay being of different height and framing; and also the parish-church of St. Cyriac, into which an ancient house has been built now forming the north transept. On the north of chancel is the vaulted Talbot chapel.

A closing meeting was held at the town-hall under the presidency of Earl Nelson, when the members were entertained by the Mayor of Devizes (Mr. T. Chandler). The ancient corporate deeds and charters were examined by Mr. W. de Gray Birch, F.R.S.L., and the borough maces and regalia by Mr. G. Lambert, F.S.A. A paper was read by Mr. G. R. Wright, F.S.A., on "The History and Hardships of the Present Laws of Treasure Trove." The author showed that the existing laws under which the Crown could claim any articles of gold or silver found buried in the earth greatly checked the searching of land for archæological treasures, and was injurious and objectionable in every way, and he urged the necessity for the amendment of the law. In the discussion which followed Mr. C. H. Compton thought the law might stand if the Treasury were compelled to place all articles claimed in museums for the benefit of the public. The President then delivered a farewell address, in which he summarised the week's proceedings, pointing out the way in which archæologists had been compelled to revise their opinions. He had particularly noticed that what were formerly called Roman camps they now concluded were really British, and in the same way as these groundworks had been ascribed to the earlier inhabitants, so also some of the churches which had been called Norman were now called Saxon. This was most reasonable, because Norman architecture just came into use under Edward the Confessor, and surely William I. would not have pulled down every scrap of Saxon building. Something has been done by Dr. Phené's excellent paper to elucidate the mystery which hung over Stonehenge. He thought the outer entrenchment at Stonehenge should be preserved from public mutilation, and he hoped something would soon be done to keep the stones from being touched, and he also trusted money would be raised to keep the tottering stones in their places, as well as to buy the Roman remains at Bromham. He thanked Colonel Bramble for his excellent paper on abbeys and priories. Henry VIII. had been blamed for the destruction of the monasteries, but the greatest blow had been struck at them by Henry V., when they began to make themselves political. In conclusion, Lord Nelson said he did not think they would fully appreciate the papers they had heard until they had had time to digest them thoroughly.

After a few toasts, votes of thanks were passed to the President, Mayor, and Corporation, to the Wilts Archæological Society, the readers of papers, and those who had shown hospitality, and not least, to Mr. G. R. Wright, the active and courteous congress secretary, and the local secretaries, Messrs. J. Reynolds and W. H. Butcher.

MONDAY

was an extra day, devoted to Longleat, the seat of the Marquis of Bath, and a party of 36 proceeded to Warminster by train, and thence by carriage, long circuits through the park being made on the way thither and back. The mansion was erected on the site of a small Augustinian priory by Sir John Thynne, in the middle of the 16th century; the architect being, it is supposed, John of Padua, who has also been identified with John Thorpe. The building accounts are preserved in the mansion, and range from Jan. 21st, 1566-7, to March 20th, 1578, during which time about £8,000 was spent. Sir C. Wren carried on the work for the fourth Thynne, his work including the staircases, and a porch since removed to Warminster School. The north front is the work of Jeffrey Wyatt. In the other façades, a curious blending of Tudor and Classic details combine to give character and dignity to what Fergusson styles "one of the largest, as well as one of the most beautiful, palaces in England of its day." With large, mullioned windows and projecting bays, are combined the use of the "Three Orders" in the successive stories, and Italian pilasters, entablatures, chimneys, and balustrading; while later architects have added cupolas and statues, to break up the sky-line. The interior contains a series of grand apartments, remodelled by Jeffrey Wyatt in the early years of the century, the upper suite of rooms has, during the past eight years, been in process of completion and decoration, from the designs, and under the superintendence of, Mr. Crace, of Wigmore-street, W., a work yet in progress; and the noble owner, the Marquis of Bath, is, it is understood, ever adding to the treasures of 15th-century tapestry, buhl-work, cabinets, ancient and modern enamelled glass, &c. The grand saloon has been decorated from the designs of Mr. Fox; the coffered ceiling is profusely gilded on the leading lines, and inlaid with painted panels. The collection of paintings is almost confined to portraits of the Thynne family and their connections by marriages; but the pride of Longleat is the magnificent library, including Caxton's "Recuyell of ye Histories of Troye," printed in 1474, probably at Bruges, in splendid preservation; a "Polychronicon," printed at Southwark, 1527; large family Bible, 1541, containing entries of births and deaths by Sir John Thynne, the builder of Longleat. In a room above is the choicest part of the library of good Bishop Kerr, who for 20 years found a home in his retirement here. A catalogue of the contents of Longleat would be as uninteresting as it would be out of place, but the general arrangement may be briefly indicated. In the circuit of the house, the large hall—a lofty room with fine roof—was first visited, and then upstairs the drawing-room, which has recently been redecorated by Mr. Crace. The coffered beams of the ceiling are picked out in gold and colour, and the panels are filled with figure subjects to large scale, and in bright colours. The upper part of chimney-piece, which had a large head cutting into the cornice, has been replaced by a lower one, with François I. details, well conceived, but not quite in harmony with the Italian treatment of the older mantel-shelf. The unbroken east wall is occupied with a frieze representing the story of Circe, and beneath it velvet hangings, both from a Venetian palace. An embroidered tabard, woven with the arms of George I. or II., now forms a fire-screen of singular brilliancy. Traversing the long saloon decorated by Mr. Fox, in which, amongst many cabinets, is a unique Florentine one of inlaid coral, and modelled after an Oriental temple, more of Mr. Crace's work was seen in a dining-room beyond; the ceiling is rich, but not overladen with gilding; the walls are hung with gilded and figured stamped leather, and the window-curtains are of a golden-coloured plush, the floor being laid with a Wilton carpet. Bedrooms complete the suite on this floor; and returning to the ground-level the ante-library and library, the latter a noble apartment, were seen, the survey closing with the private chapel, which, in curious contrast to the gilding and colour elsewhere, is at present untouched and destitute of decoration, except that in the north window lighting the western gallery, which forms the private pew of the family, some German glass has been inserted as an inner double casement.

Some time was spent in Warminster before leaving by train, one or two of the party going on to *Bradford-on-Avon* to examine, under Canon Jones's courteous guidance, the little Saxon church he rediscovered to the north of the parish-church. The Saxon building is used as a free school-house, and has been figured by Mr. J. H. Parker and others as consisting of a shallow chancel, small square nave, and comparatively large north porch. Its general features —the massive walling, having externally flat buttresses or pilasters and circular blank arcading and channelling, hewn out of the large blocks of stone of which it is built; the rude circular windows and narrow horseshoe chancel, northern and western arches, and bas-reliefs of flying angels on eastern wall of nave, have been rendered familiar by photographs and drawings. The work was evidently executed by rule of thumb, no two curves being struck alike, and no vertical lines being plumb. Canon Jones has, however, recently found (and showed to his visitors), by a break in the masonry of south wall and weatherings in the wall above, now concealed by a lean-to addition, that there was originally a south porch, now entirely destroyed, and forming with that on the north a square-ended cruciform building.

TUESDAY.

On Tuesday a large party proceeded by road to Marlborough, where, after seeing the two churches and the castle, they were entertained by Mr. Merriman, and afterwards drove through Savernake Forest to the large cruciform and flint-built church of Great Bedwyn, thus worthily concluding the nine days' proceedings.

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SUSSEX ARCHÆOLOGICAL SOCIETY.

ON Thursday, Aug. 12, the members of the Sussex Archæological Society left Brighton for Drayton Station, where carriages were waiting to convey the party to Boxgrove Church, which was described by Mr. Lacy W. Ridge. The oldest part of the structure, said Mr. Ridge, probably dated from about 1117. "Of purely Norman date we have the transept walls, arches, and windows, the arches on the south side of the existing bay of nave; and the charming external fragment the entrance from cloisters to chapter-house. Of the First Transitional period (*i.e.*, from Norman to E.E.) we have the ruined nave, Norman in general tone, but pointed in its arches, and first presenting that system of coupled bays which gives so marked a character to the choir; the arches of the crossing with the pointed and great circular caps and bases which sweep round and gather up the odd sharp pointed mouldings of the piers and arches, so characteristic of a state of transition wherein the pointed form was applied experimentally, and the due subordination (that is the arrangement in rings) of arches and pier, was not yet reached; the arcaded bell-story, heavy in its proportions and its details, with square abacus and coarsely moulded but pointed arches; and last, probably quite late in the transition, the bell-story with circular arched openings, but having on their inner arches a moulding under-cut and refined to an extent far in advance of any of the preceding work, which may well be a standing warning to us not to trust too implicitly in assigning dates to the buildings to the form of the arch. Next the Transition is over, the great century of mediæval art has come, the style which is to produce Lincoln and Salisbury, the west front and the sculptures of Wells, and the great Cistercian Abbeys, is established. The great cathedrals throughout northern France are rising rapidly. No longer does the apsidal east end satisfy the architectural taste of the day. Everywhere in England the apse is being removed to make way for the prolonged choir and square end; and in no cases is the change more apparent than in the West Sussex churches of Chichester, Shoreham, and Boxgrove. Not only is the choir to be rebuilt as an integral and in some sense separate part of the church, but a new departure is to be made: a larger scale is to be adopted, new materials are to be introduced and a higher level of art workmanship is to be attempted. True, the new choir will dwarf the tower, and not altogether harmonise with the old work, but that to the ambitious mind of the 13th century architect was a trifle. Posterity might rebuild transept, nave, and tower, and if here at Boxgrove the hope was destined to be disappointed, architectural history shows that this was the exception, rather than the rule. Exact parallels are, however, to be found at Carlisle Cathedral and elsewhere. The old tower is complete in itself: it has its large arches, arcade, or triforium and bell-story just like any other central tower—that at Chichester for instance, in which, however, let me parenthetically remark, all character was lost at the rebuilding, by leaving open without louvres or other form of inclosure the openings of the bell-story. Fortunately, it is a thing easily remedied. Boxgrove Tower is complete enough, but is eclipsed by the larger scale of the newest portion of the church. Circumstantial evidence renders it possible to fix with certainty the date of the choir and to assign it to the early years of the 13th century. With the completion of the choir the building was finished, except that a chapel, now the entrance porch, was added, and the vestry, the flint work of which should be noticed, in the 15th century. New windows were inserted from time to time, and tombs erected; but I believe that, except the large chantry, they are to be dated only by their architectural features. The interest of the church undoubtedly centres in the choir. The effect of size produced is far in excess of the actual dimensions, for although the total length of the whole church was very considerable, some 230ft. or more, the clear width of the choir is only 20ft., and the height from floor in sacrarium to boss only some 35ft. I think this arises from the double bays of the lower arcade, combined in the clerestory, and vaulting into a single bay, which seems to multiply the number of parts without necessitating diminution of size, and to maintain that simplicity without which there is no grandeur. It imparts to the building an effect which is strikingly original. The way in which the space which would ordinarily be the triforium, that is the cover, the part of the wall against which the aisle-roof abuts, is thrown into the ground-story aids also both the appearance of size and the originality of design. No one who is familiar with the eastern bays of the choir or presbytery of Chichester Cathedral can fail to be struck with the close relationships of its design to this choir. The clerestory here is little more than an adaptation of that of the Cathedral, the chief difference being the side marble shafts are carried up much higher than at Chichester, where they are somewhat dwarfish beside their tall central neighbours. The lower half of the design is a bold development of the triforium; in each case a great round arch inclosing two pointed ones. Nor does the relationship of the two designs stop here. The idea of the ground-story piers of the presbytery, the great central circular shafts with their detached rather than clustered columns around, finishing at the top in carved marble caps, with which, I suppose, nearly all of you are familiar, were taken as a model by the architect of Boxgrove, and anything these piers we see before us may want in size and richness they gain in refinement. Taken in conjunction with the larger piers with their really almost solid, though apparently shafted, stone cores, I doubt if the whole range of Early English art can furnish a more beautiful specimen of piers than those of which we are speaking. Now, the eastern bays of Chichester being erected between the fire of 1186 and the consecration of 1199, are most interesting, not only from their extremely great intrinsic beauty, but also as a specimen of the very last stage of the Transition. Boxgrove must have followed, and must have followed very closely, on the other work. The greater refinement in detail, the more perfect system of proportion, the more perfect drill of the orders or rings of arches—as to which they came to considerable grief at Chichester—the fillet or flat piece on the large beads, all prove the former point, while the round arch and the unconventional look of the building altogether prove the latter proposition. One extremely interesting point was brought out by the measured drawings, plotted to scale, made by me of this building; namely, the existence of a system of geometrical and numerical proportion to which I attribute that refinement which, to my eye at any rate, is very striking in its proportions. You will easily realise what I mean by a double equilateral triangle; that is, two equilateral triangles described on opposite sides of the same base. Now the section of the choir from paving to boss incloses such a figure, that is two equilateral triangles described on a line clear of the walls in height. The double bay being square, the side wall takes, of course, the same figure. The same figure fits into the opening from choir to aisle. Such a figure fits, exactly on plan into the space occupied by choir and aisles. The same thing, to some extent, holds good in the older part of the building; in the opening to north transept, and, I think, the double bay of nave. Certainly, the nave double bays, instead of being square on plan, as in the choir, have a width from west to east equal to the height of an equilateral triangle on the clear width of nave as a base. Again, the height from floor to top of string under clerestory is the height thence to boss as three to two. From floor to top of capitals is as two to one within the arch, and as two to three up to string. Proportions of this kind do not hold in all Mediæval buildings, though I have met with other specimens of it. Where they are to be found, the fact certainly imparts an additional interest."

The Priory Ruins and Halnaker House were afterwards visited, and then the party drove on to Goodwood, where dinner was served. Goodwood House was afterwards inspected. Amongst the art treasures may be mentioned paintings by Vandyke, Sir P. Lely, Kneller, Nollekens, Turnerelli (not he of the wreath), Sir Joshua Reynolds, Gainsborough, Lawrence, Romney, the Smiths of Chichester, called often the "Sussex Claudes," and many others. Everyone was attracted by the cenotaph representing the murder of Lord Darnley. This was painted in 1567, and was brought to England by the Lennox family from the Château d'Aubigny. The curiosities, trophies, medals, testimonials, &c., would have well sufficed to occupy a day very profitably. The grand trophy presented to the late Duke of Richmond (the first patron of the Sussex Archæological Society) for his exertions in securing the distribution of the medals due to officers and soldiers in various engagements, and which was subscribed for by every officer and by all the men, amounting to £1,500, attracted universal attention. Napoleon Bonaparte's plate used on the morning of Waterloo, the shirt of Charles the First, and many other rare and curious relics were all examined. A walk through the gardens and the private pleasure grounds completed a most enjoyable tour. Taking to their carriages, the visitors made for Chichester station, and after some delay reached Brighton about nine o'clock.

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ARCHITECTURAL ASSOCIATION SURVEYING CLASS.

TO the many and great advantages offered to the junior members and students of the architectural profession has been added a surveying class. This year's course of lessons has just been brought to a close. Arrangements were made with Mr. A. T. Walmisley, C.E., of 5, Westminster Chambers, Victoria-street, to give twelve lessons (six indoor lectures and six field lessons) which should embrace surveying with chain only; with chain and the theodolite; plotting; various methods of setting out curves with and without the theodolite; explanation of rules and tables connected therewith; the box-sextant and optical square protractor and vernier explained, levelling, adjustment for reversion, collimation, explained and illustrated practically. Calculation of areas by the planimeter; contours; calculation of drainage; areas and capacities of reservoirs, calculation by Bidder's tables of earthwork on banks and cuttings from railway sections; the eidogragh explained. In short, the instruction included every branch of land-surveying likely to fall within the experience of an architect, and Mr. Walmisley certainly spared no pains to make it thorough as well as comprehensive. The indoor (theoretical) lectures were delivered in the committee-room of the R.I.B.A., on Thursday evenings at 7 o'clock, and the field (practical) lessons on Hampstead Heath at 3 o'clock on Saturdays. It is to be hoped, when the class is more regularly established and more widely known, the members will more numerously avail themselves of its invaluable aid.

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ILLUSTRATIONS.

NEW PARISH-CHURCH OF ST. PAUL, HAMMERSMITH.—PALACE HOTEL, &C., SOUTHPORT.—DESIGN FOR A SUMMER-HOUSE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

NEW PARISH-CHURCH, HAMMERSMITH, W.

Our illustration shows the design for the new church which is shortly to take the place of the present unsightly and inconvenient building. The plan shows a nave 103ft. long by 30ft. wide and north and south aisles 13ft. 6in. wide; entrance porches at the west end, and doors for exit at the east end of the aisles. A large baptistry at the west end of the nave is a prominent feature of the design. The chancel, 42ft. long and 30ft. wide, has accommodation for a choir of fifty. Proper exits for communicants are provided by means of choir aisles. The tower at the north-east angle of the building is 127ft. in height from ground to top of parapet, and 153ft. to top of pinnacles, and is well placed with regard to the site. The lower stage forms a clergy vestry 16ft. by 16ft. The choir vestry, 33ft. 9in. by 13ft. 6in., is placed at the east end of the chancel, and communicates with clergy vestry, and with organ-chamber in south aisle of chancel — a very convenient arrangement, and the only one which could be adopted without any interference with graves—a matter which has evidently been carefully considered. This church will accommodate, on fixed benches, 1,012 adults, but, by chairs and sliding seats for occasional use, this number may be increased to 1,220. With regard to the erection of the new building, it is proposed that the tower of the existing church be first pulled down, and the nave and its aisles, &c., then built westward, leaving the rest of the present church up for use till this part be completed, after which the old church will be pulled down and the new chancel, with its aisles and vestries (including lower stage of the tower), will then be built. The proposed outlay on these portions of the structure is £15,000, but it is estimated that about £5,000 more will be required to complete the building. For so large and important a parish-church this is certainly not an extravagant sum. The ground-plan seems in all respects carefully studied, and very conveniently arranged, and the exterior and interior both show a considerable amount of quiet dignity derived from well-considered proportions rather than from anything like fussiness or pretentious ornamentation. Mr. John P. Seddou and Mr. Hugh Roumieu Gough, of Queen Anne's Gate, are associated in this matter as joint architects.

THE PALACE HOTEL HYDROPATHIC AND SPA COMPANY (LIMITED), BIRKDALE.

The directors of the Palace Hotel Company, Southport, Lancashire, have taken powers to add a hydropathic establishment to the hotel, and have given their architects, Messrs. Mangnall and Littlewoods, of Manchester, instructions to erect baths on a magnificent scale, and superior to any hydropathic establishment now in existence. The foundations for the work were completed in June, and contracts for the superstructure were let to Mr. Bridge, contractor, Southport, in July, and it is expected his contract will be completed in six months from that date. The new wing will be on the north-east side of the present building, and coextensive with the present frontage, and will consist of a new dining-room, capable of dining 180 persons—the present dining-room will be converted into a coffee-room. Also a large handsome room, 80ft. long by 40ft. in width and 26ft. in height, will be erected for recreation purposes, and to be used also as a promenade, similar to the large thermal establishments on the Continent. It will also be used as a concert room and theatre, and will seat 600 persons comfortably; at one end a platform will be erected, to be occasionally used as a stage. There will be eight baths for ladies and the same number for gentlemen. Six of these, in each case, will be constructed with marble and tiles, on the tank principle, with double dressing-rooms and all other conveniences, similar to the last new baths at Buxton; each will be supplied with hot and cold, sea and fresh water, and will be fitted with douche and shower-bath to each. In addition to these baths, there will be medicated-baths, where the various German waters, similar to Homburgh and Weisbaden, will be applied; there will also be a room fitted up for inhaling medicated vapours. There will also be ascending and descending wave and spray-douches, sitz-vapour, and Russian-baths, and the Turkish-baths will be the most complete in the kingdom; there will be two hot-rooms, and a sea-water plunge-bath connecting the same with the cooling and dressing-rooms to accommodate 20 visitors at one time. These will be luxuriously fitted with marble and tiles, and have coloured glass in the ceilings. All the rooms will be specially well ventilated, and heated by the circulation of hot-water. Machinery will be put down for pumping sea-water; with the application of settling-tanks and filter-beds, a sufficient quantity of sea-water will be obtained, so that it can be supplied for other purposes if required. There will also be erected in conjunction with the hotel, but approached from Weld-road, a refreshment-café, with separate rooms and entrances for excursionists. The building will accommodate 130 to 140 visitors. The new buildings will have a parallel frontage with the present building, and are designed in keeping with the present hotel, and will be constructed chiefly of ornamental brickwork, stone being introduced for strings and cornices, &c. The café will have overhanging-eaves, and be of appropriate design, similar to the cafés met with on the Continent. The works will be pushed on as quickly as possible, for use during the next season. In the mean time, the hotel is under the able management of Mr. Frederick Ferris Baker, who so successfully conducted the Victoria Hotel, at Southport, for several years.

"BUILDING NEWS" DESIGNING CLUB—A SUMMER-HOUSE.

This week we publish perspectives of all three of the designs sent in competition for this subject. Although the conception by "Sub Silentio" is the more finished, that by "Edwin" has been placed first, because his design more nearly fulfils the requirements of a semi-rustic erection. The Late Gothic design by "Alfred" comes in a good third, and although so few designs were submitted, the competition is a satisfactory one.

NEW WORKMEN'S CLUB, WOOBURN GREEN.

This building, which we illustrated last week, has been erected opposite the picturesque green at Wooburn, Bucks, by the munificence of the late Alfred Gilbey, Esq., J.P. It is a brick-and-tile structure, containing large general reading-room and boys' room, capable of being thrown into one lecture-room of considerable size; smoking-room panelled with American oak, with entrance hall, serving bar, and complete caretaker's residence, offices, &c. The fittings have received special care, and Maw's wall and floor tiles are largely used. The total cost of the building has been about £1,250, and it is let at a nominal rate to the Club committee. Messrs. Taylor and Grist, of Bierton, Aylesbury, were the contractors, and the architect was Mr. Arthur Vernon, of 26, Great George-street, Westminster, and High Wycombe, Bucks.

SCHEDULES OF PRICES.

It may be worth remembering what Sir Edmund Beckett has said about "schedules." As so much has turned on them of late, and as the observations are practical, we quote them in full. "Contracts are sometimes taken upon what is called a schedule of prices, which means a contract to do whatever quantity of every specified kind of work is prescribed by the architect or the employer, if he is allowed a voice in his own affairs—at such and such prices. No sensible man, however, will let the contract be solely on that footing, as it gives him no idea of even the least he may have to pay. The contract ought to be, as usual, for a certain sum for the work indicated in the plans and specification: but it is useful, and may prevent disputes, to have a schedule of prices for extras, which should be the prices which the contractor has put upon the respective kinds of work in the plans for his own calculation of the total amount. In that case you pay for the extras as you would have done if they had been originally in the plans, which, of course, is fair to both sides. But care should be taken that omissions are not calculated without builders' profit and additions with it, as I am sure they very often are if you do not make a bargain for them when they are ordered. I have often said that whether you turn a window into a blank wall, or a wall into a window, it is certain to be claimed for an extra if you leave it to be settled afterwards." This advice, written for the good of the public, is sound, and we particularly endorse the last sentences, namely—that omissions ought to be calculated to include builders' profit upon the same schedule. It is almost notorious in ordinary contract work if omissions occur, and they are seldom looked after, they are swallowed up in the extra work or additions, and no proper allowance is made for them as there ought to be. It is too often that the builder urges that the omission of something has not saved him anything, and with this view it is not taken into account, or the omission is priced according to another schedule than that upon which the extras are based. This is scarcely justice, and we do not mean to say it is followed by straightforward contractors.

THE LATE MR. W. PENSTONE.

We regret to announce the death of Mr. William Penstone, architect, of 22, Great James-street, Bedford-row, on Monday afternoon last, at Cleeve Abbey Farm, Washford, near Taunton, where he was staying to recruit his failing health. For some years past, consumption has been evident, and, in consequence, Mr. Penstone has been obliged, more or less, to keep his room. He was the architect of some schools in Berkshire, and elsewhere. Drawings of two of his schools were exhibited by him in this year's Royal Academy Exhibition, as well as many other drawings he had made. In consequence of his ill-health, he was advised to devote his attention to the preparation of perspectives. No doubt, many of our readers are well acquainted with his drawings, many of which have been reproduced in this paper. Mr. Penstone was a constant contributor of sketches to the Architectural Association Sketch-book, in which he took a very great interest. We believe Mr. Penstone was in the 34th year of his age.

CHIPS.

At a meeting of the Aldershot local board of health, held on the 10th inst., Mr. W. L. Coulson was unanimously elected surveyor, out of 108 candidates.

A new U. P. church at Galashiels was opened on Aug. 19. The church is in the Early English style, from designs by Messrs. Thornton, Shiels, and Thomson, architects, Edinburgh. The tower is square to a height of 70ft., and the spire rises to a height of 50ft. from the tower. The church has accommodation for from 750 to 800 sitters. The total cost is about £4,500.

A new hospital has just been erected at Dawlish, and will be opened in September next. Mr. Bridgman, of Torquay, is the architect, and Mr. H. Baker is the contractor.

A new Wesleyan chapel at Poole, was opened on Wednesday week. It is Early English in style, and has an octagonal tower and spire 90ft. high. Sitting accommodation is provided for 950 worshippers at a cost for erection of £4,000.

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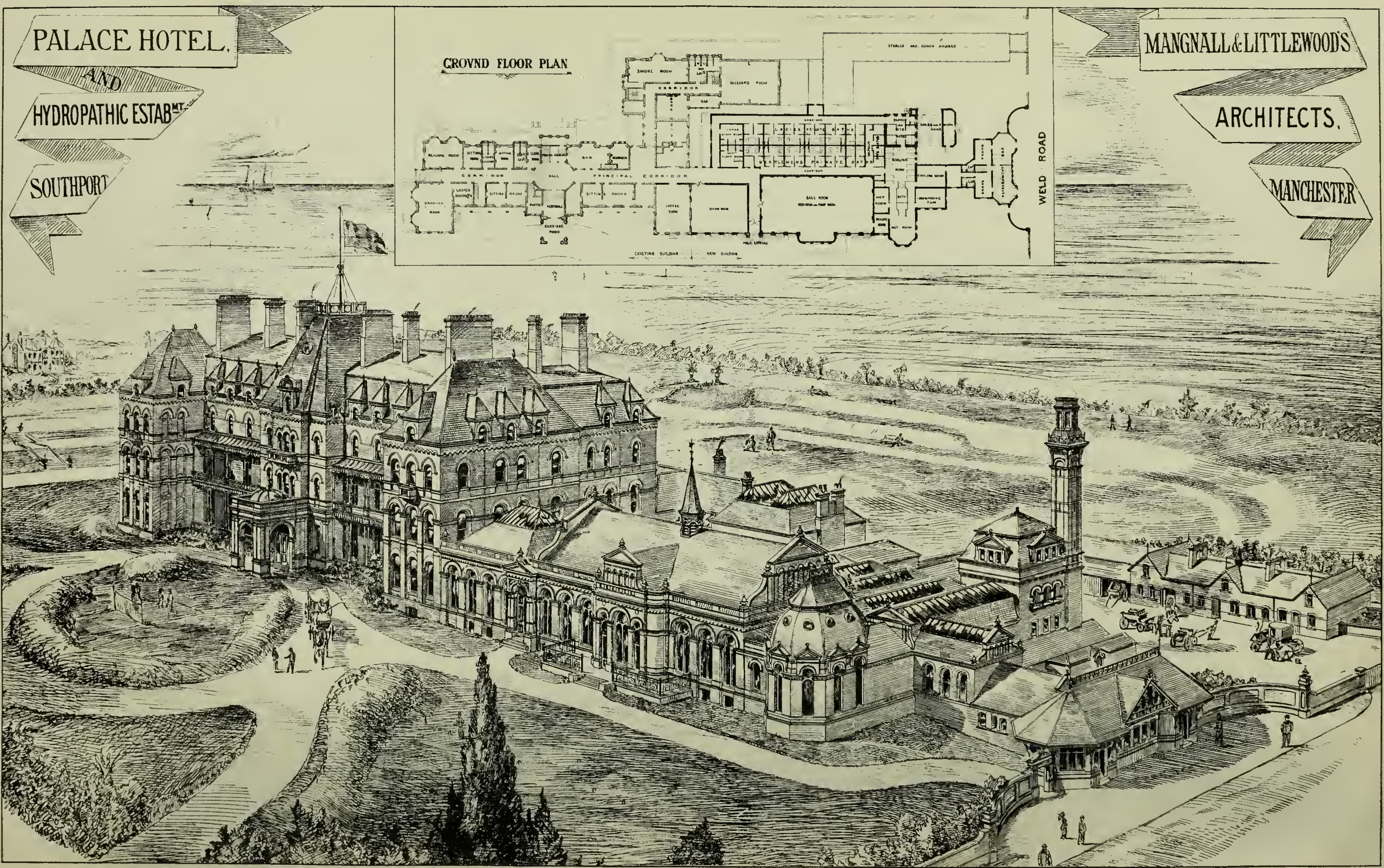

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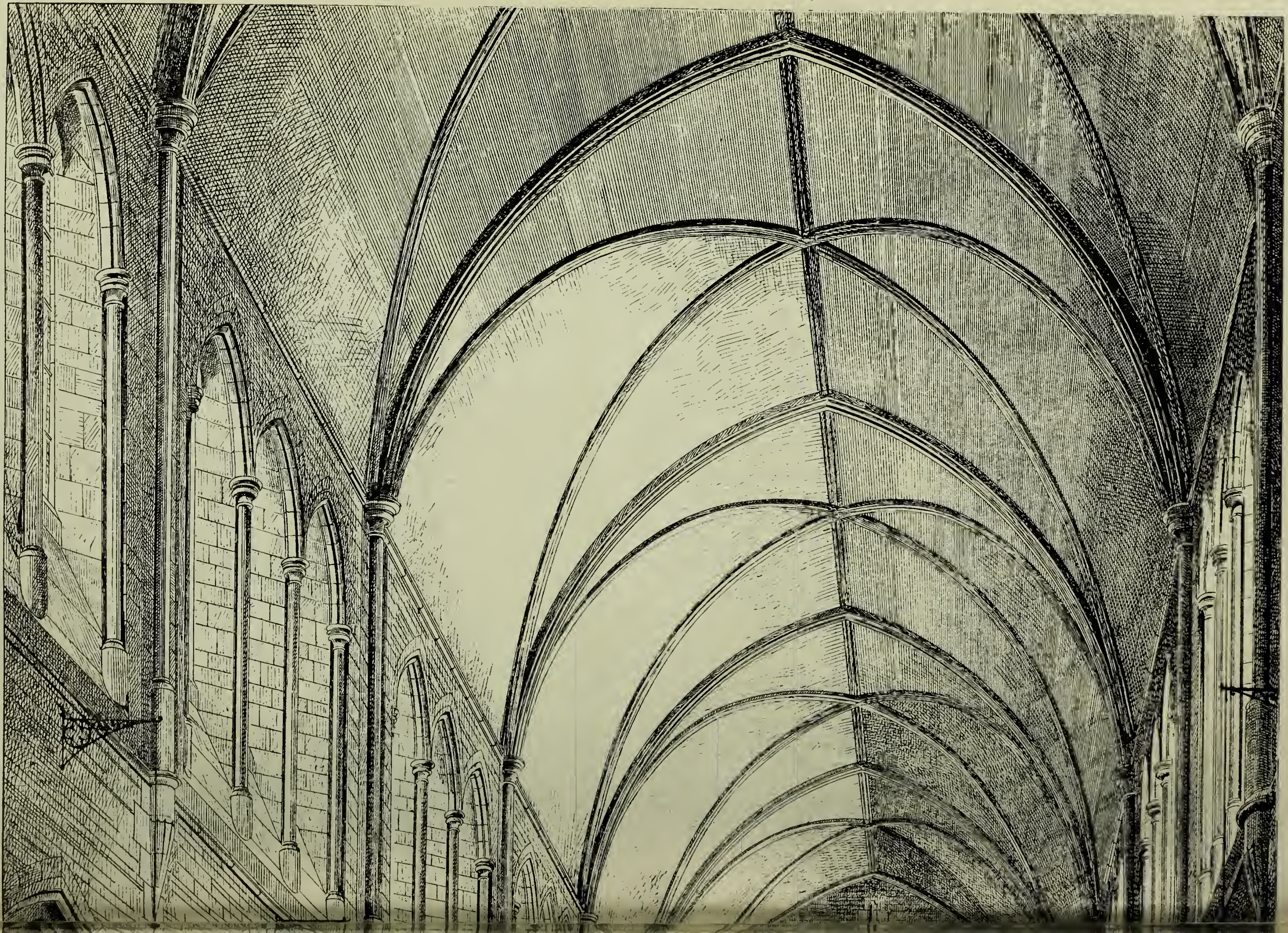

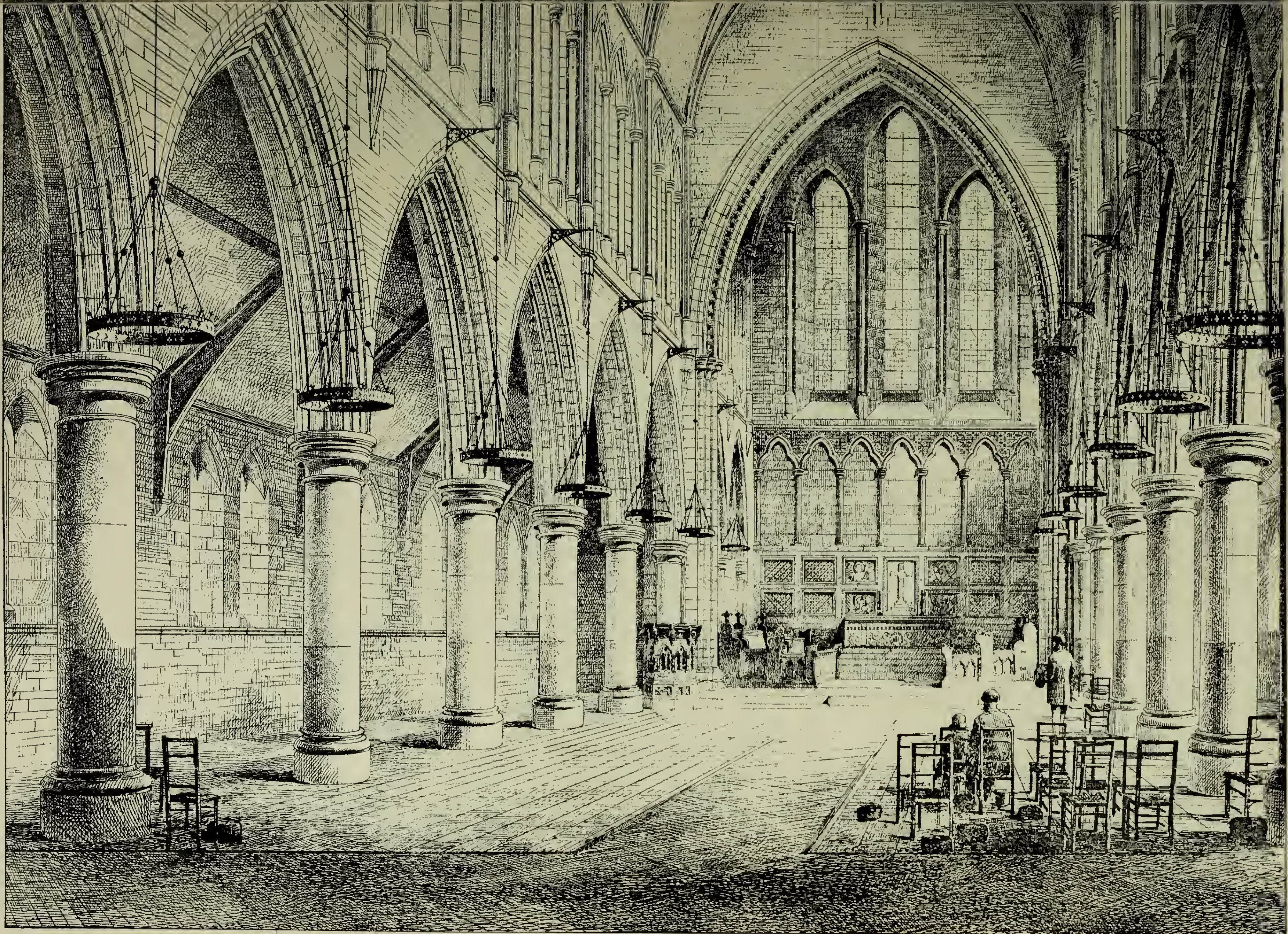

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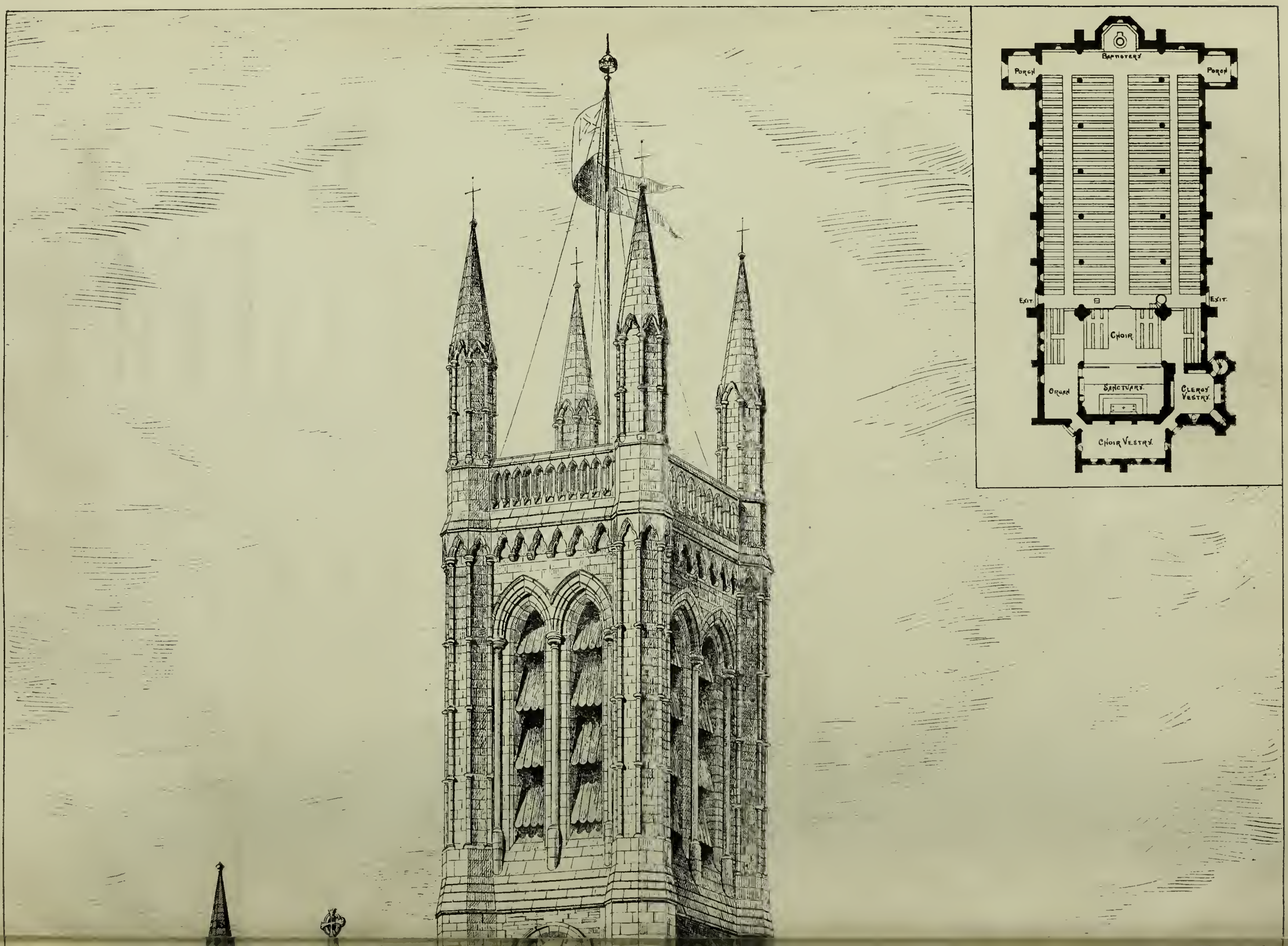
THE NEW PARISH CHURCH OF S.T PAUL: HAMMERSMITH W. *JOHN P. SEDDON* AND *HUGH ROUMIEU GOUCH* JOINT ARCHITECTS.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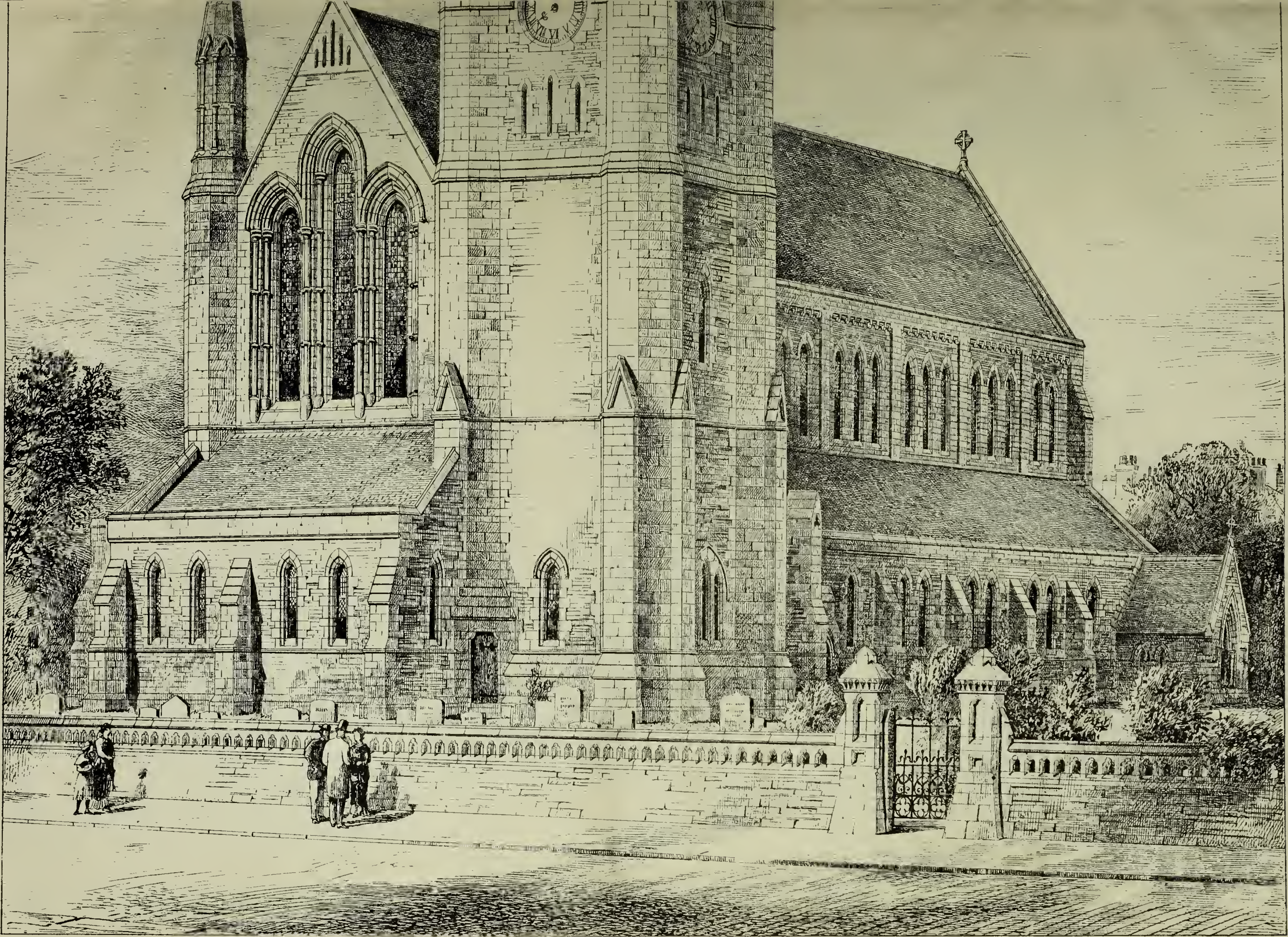

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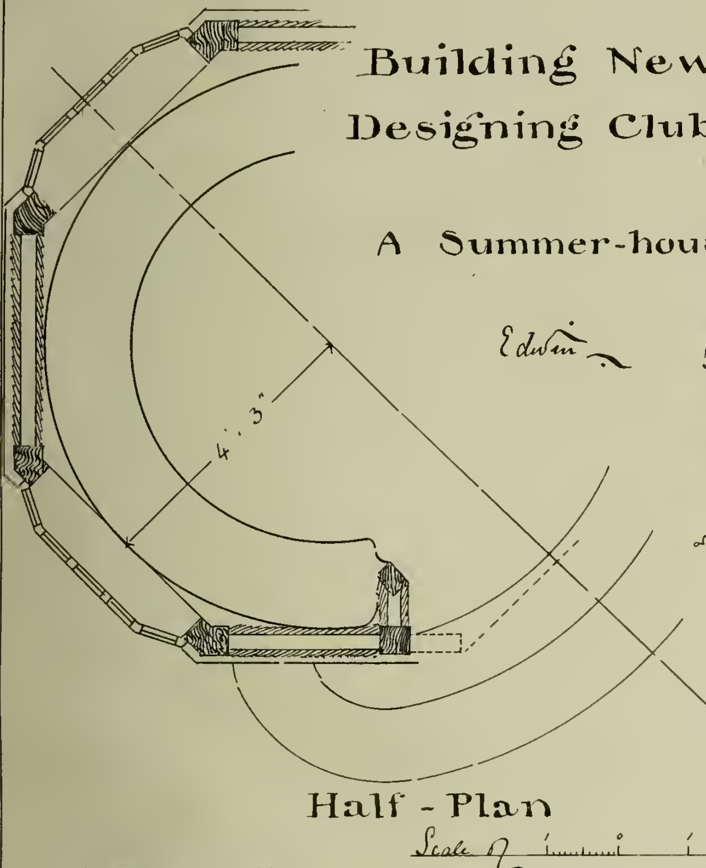
THE NEW PARISH CHURCH OF S^t. Paul: HAMMERSMITH W. *JOHN P. SEDDON* AND *HUGH ROUMIEU COUCH* JOINT ARCHITECTS.

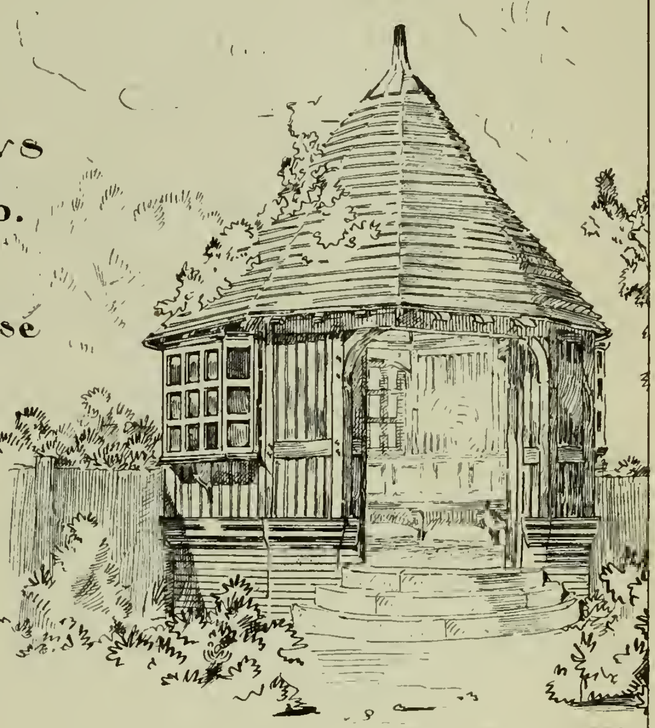
Building News Designing Club.

A Summer-house

Edwin

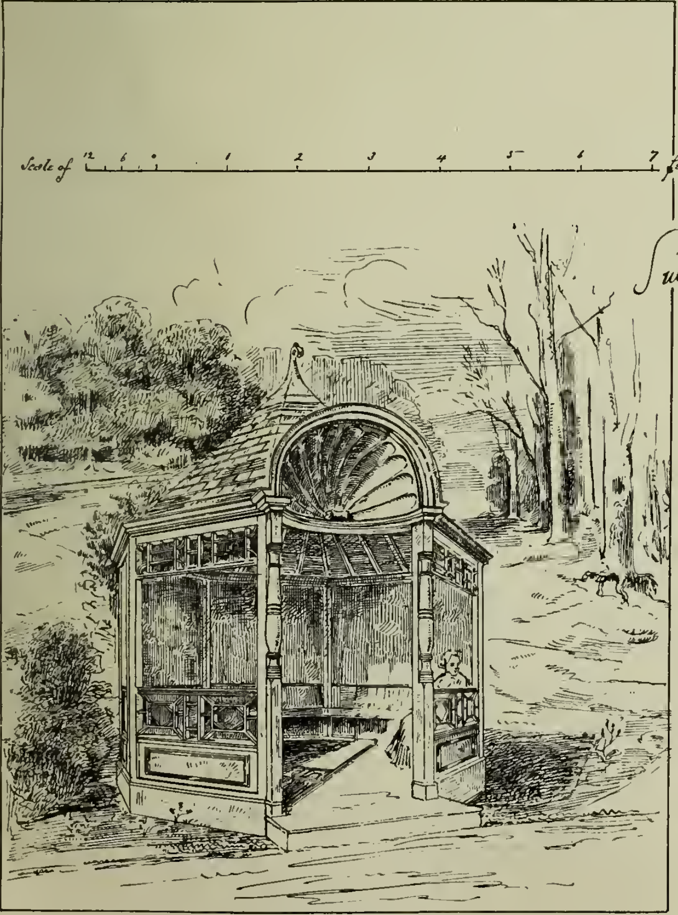


Half-Plan



Sketch

SELECTED DESIGN



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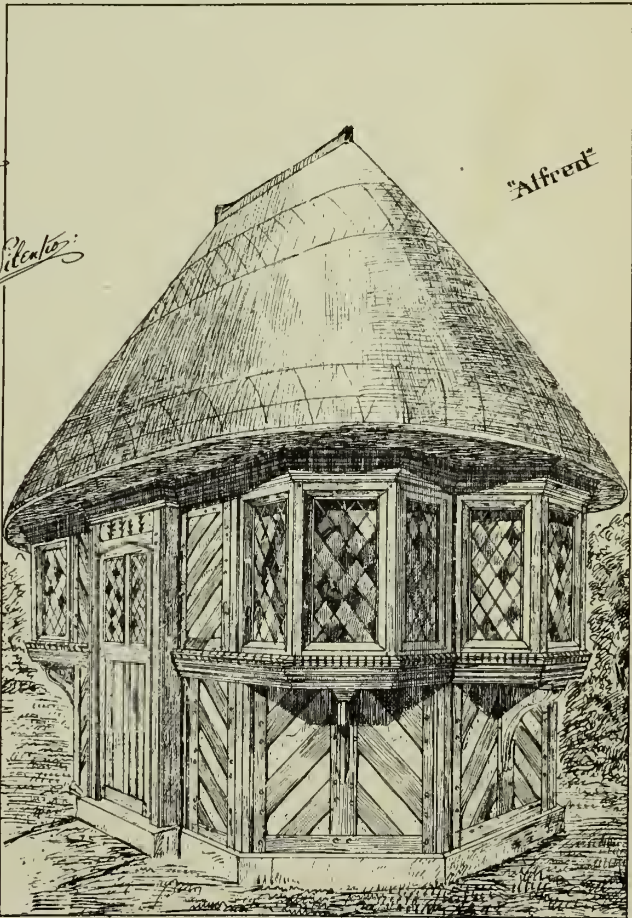

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ARCHITECTURAL NOTES FROM NORFOLK.

THUS far we have followed the Architectural Association excursion party from Norwich through the Cawston district, and to-day, by the aid of our own notes taken on the occasion, we propose briefly to continue the description of the places visited during the remainder of last week, keeping the architectural rather than an archæological interest in view. On Wednesday an early start was made, after a breakfast at 7.30, for North Walsbam, by rail; indeed, this manner of commencing operations was found necessary every day, in order to reach the first stage of the journey without loss of time, and so it was arranged that a special railway-carriage should be held in readiness for the excursionists. North Walsbam, with its quaintly-designed market-cross, erected in Edward VI.'s reign by Bishop Thirlby, was reached rather before ten, and here the assemblage was photographed, in front of the S.W. porch, by Mr. J. L. Robinson, architect, of Dublin. This gentleman, who is a very able amateur photographer, brought his camera with him and took photographs of every place visited, so that, by the end of the week's excursion, about one hundred views were secured. Of these a selection will no doubt be supplied to the members, in obedience to a unanimously-expressed wish. The town of Walsham is only remarkable for its church, which is of the Late Decorated period, having no clerestory, but presenting a grand interior. The work is Perpendicular in feeling, and the general character of the church differs materially from those already described. A roof of one span is noted, and no arch is used to divide the chancel from the nave. The font-cover deserved the attention devoted to it, especially on account of its rich tabernacle-work, and so did the porch already referred to. Most of the sketches made were of this feature, which is a grand two-story building of Henry IV.'s time. The west tower is in ruins, having fallen in 1724, and again in 1835; but parts of the walls 147ft. high, remain standing, and combine in a pleasing manner with the grouping of the houses and market-cross, as seen from the village-street, from which the church itself is rarely hid by its immediate surroundings. The church has been carefully restored, and in spite of the description given by the writer of "Restoration in East Anglia," published by the "Society for the Protection of Ancient Buildings," the new work here does not look "hideous." The lower part of the rood-screen remaining, with its elaborate painted panels of Saints, is worthy of special notice. By carriages, the party now proceeded to Trunch, which lies from North Walsingbam about half an hour's drive in a northerly direction. The following rhyme describes the close way in which the parishes just in this neighbourhood are arranged:

"Gimmingham, Trimmingham, Knapton, and Trunch,
North Repps, and South Repps are all of a bunch."

The Early 14th-century Church of Trunch is chiefly known for its exceedingly remarkable "baptistry" or rather "baldachin," which is very similar to the stone example at Luton, in Bedfordshire. Here the structure is of wood, richly carved and supported on six massive posts, having annulets rather stone-like in detail. The style is very Late Perpendicular, having ornamentation in free forms and foliage. The stilted or rather tricky rise in elevation of the battlemented cornice to the carved projecting canopies in the upper part, by which the curve on plan is intensified in perspective, is worthy of note as a permissible expedient. The painted rood-screen deserves more than a note, and likewise the fine hammer-beam roof with its treatment of intermediate principals, every other one of which is brought down on wall shafts, the others resting simply on corbels. The chancel is possessed of a fine set of stalls returning at the west end, but they are in a dreadfully dilapidated condition, like the whole of the sanctuary. This part of the church is hardly ever used, the vicar, who has held the living for fifty years, being of the opinion that a chancel for such a church is hardly a necessary feature. The altar is a mean table, only rendered more so by the dirt which is upon it, in which respect it competes with that in the abominably dirty church of Knapton, which was next seen.

Abominable" is a strong term no doubt to employ when describing the condition of so sacred a building as an English parish-church, but the word is in no way too forcible. Neglect and dirt combine with the elements in perpetuating the desolate condition in which this magnificently-roofed church has been allowed to remain, at any rate for the last fifty years. The roof is of double hammer-beam construction, exceedingly rich in carved ornamentation and in elaborate colour decoration, so that it may well be described as being one of the very finest examples remaining anywhere. This fact alone, it would have been thought, should secure the church against the ruin which must before long happen if nothing is done to repair the structure, not to name the necessity of making the church simply decently convenient for the purpose of holding service. The rectorial right is vested in the Master of Peterhouse College, Cambridge, and we regret to say that the repeated efforts on the part of the churchwarden and others to get help from those who should consider the present state of things a standing disgrace, have proved of no use at all. The vicar of the church is non-resident, and services, such as they are, are performed by a varied series of curates. The font is an early example of marble, Transitional in style, standing on four detached and one central shaft, and it is covered with a most interesting baldachin-like cover, bearing the date 1704, and having good turned balusters with well-proportioned mouldings and cornices. The font itself is never used, but a common white slop-basin does duty for a font by its being stood during service on the font-steps.

At Edingthorpe, which is two miles S.E. of Knapton, an interesting church, in its way, was seen. The west tower is one of the Norfolk round towers, developing, in this case, into an octagon at the belfry stage. Some good windows remain in the south aisle, and a decorated screen to the chancel, with the wrought-iron hour-glass stand, &c., deserve mention. After a sharp drive by the sea, leaving Bacton on the left, the excursionists reached the ruins of Brombolm Priory, which was founded by William de Glanville for Cluniac monks in 1113. As a remote and struggling cell attached to Castle Acre Priory, it had long led a chequered existence, when, in 1205, the remarkable relic, afterwards known as the "Rood of Bromholm," was purchased by the Prior and brethren of Bromholm, in return for the hospitality they afforded to the English Chaplain of Baldwin of Flanders, Emperor of Constantinople, and who, when his master was defeated and taken prisoner at Adrinaople, fled, with all the relics from the Imperial Chapel which he could bring away with him, to England. No one would buy the piece of the true Cross above referred to, till the Chaplain reached Bromholm, where it was secured as already described. In 1223, the relic wrought many miracles, and its fame spread far and wide, so that pilgrims flocked from all parts, bringing, ten years later, Henry III. himself, and thus the Prior collected a vast sum of money, with which he built a fine series of buildings, only traces of which now remain, excepting part of the chapter-house, N. transept of the church, and dormitory. The remains show work of Transitional and Early English period of great beauty. We trust the present owner, the Earl of Kimberley, will not allow the remains to continue in their present neglected condition, but that some means will be taken to preserve so valuable a specimen of architectural detail, and so conspicuous a landmark in the history of England and its Church. Retracing their steps to some extent, the excursionists, by a long drive through a beautifully-wooded district, reached the well-known and justly-celebrated church of Worstead. During the prosperous times of this place, when its manufactures of the woollen fabric known as worsted were in their most flourishing condition, this church was erected, without stint or thought of costly outlay. It is one of the grandest in the county, and as a specimen of Transitional from Decorated to Perpendicular is singularly unique. The three screens at the east end, dividing the chancel and chapels from the nave and aisles, are very good and elaborate; but the screen at the west end of the building has been quite spoiled by the dreadfully ugly paintings in the panels, by a local amateur lady artist. The roof, of hammer-beam construction, is a good example of common-sense carpentry, in an admirable state of preservation. The pinnacles on the tower are not by Mr. Phipson, as stated, but were erected about 18 years since. They spoil the outline of the top stage of this grand tower, the "sound-holes" of which are very remarkable and good in their tracing. The 1790 oak pewing is not bad in detail.

Thursday's visits were devoted to the following places, all of which lie to the north-west of Norwich: East Dereham, New Walsingham, Houghton-in-the-Dale, East Barsham Hall, and Fakenbam. East Dereham, which will ever be remembered in connection with its associations with Cowper, is a clean town, having a broad high-street leading to the church, with its two towers, that on the south side being known as "the New Clocker." It was built in Henry VII.'s reign, when the central tower, with its fine lantern, was found too weak to carry the bells. The church consists of nave, with aisles, central tower, two short transepts, having aisles on the east side as chapels, and chancel. The grand interior is spoiled by the huge galleries, which, at any rate for the present are necessary, it was said, to afford accommodation for the parish. It is to be hoped that another church may before long be erected for the use of the parish, and thus enable the churchwardens of the mother church to remove these hideous obstructions just described. A good Flemish and elaborately-carved chest remains in the north transept, or, rather, St. Edmund's Chapel. It has a fine lock of earlier date upon it, and altogether may be named as a fine piece of furniture of its kind. A good view of the church may be had from the S.W., and on the N. of the church-yard a quaintly-gabled house deserves a sketch. Leaving East Dereham by train, the grand old remains of the once most famous Augustinian Priory of New Walsingham were visited. Here was situated the shrine of Our Lady at Walsingham. The party on Thursday was met by the Rev. D. H. Lee Warner, the owner of the property, and whose house stands within the priory. Mr. Warner exhibited some plans showing his excavations and the original plan of the church and buildings, and an interesting description was given by Mr. Penrose, who on this occasion conducted the excursionists. The three wells were seen, but no miracles are said to have been performed by their aid for many years, though occasionally pilgrims still come to the site of the original shrine to wash in the wishing well. The refectory forms the most valuable part of the ruins remaining of the priory, and the staircase arcade to the original pulpit deserves the most careful study on the part of all lovers of fine architecture. Nothing throughout the week was seen of equal purity of detail and outline. It is of Early English character, verging, perhaps, on the Decorated period. The gateway is a fine example of its kind, and deserves a sketch, specially for the carving of the gargoyles and the unusual head carved in a quartrefoil in the centre of the main gable. Many picturesque gabled houses remain in the town, which has changed less than most places since the 15th century, when pilgrims thronged the streets from all parts of the world. The church is not of much interest to the architect, but contains one of the finest fonts to be found anywhere, and so deserves naming to be visited. Houghton-in-the-Dale was passed on the way to East Barsham Hall. The chapel is a small but elaborate and well-designed building, of the Decorated period, and though now used as a shed and part of a cottage simply, was originally a shriving-place for the pilgrims on their way to Walsingham. Henry VIII. walked on foot from here to the sacred shrine when staying at East Barsham Hall, which, after a rapid drive, was reached about three o'clock. Mr. Penrose briefly reviewed, by the aid of Cotman's, Pugin's, and Mr. Lee Warner's plans, the original extent of this very remarkable house; and Mr. Warner added some points of interest. This fine ruin, for, unfortunately, it can be described as little else, though partly used as a farm-house, was erected by Sir Henry Fermor, in the reigns of Henry VII. and Henry VIII. It is, unquestionably, one of the finest examples extant of ornamental and cut brickwork. Several features are in moulded terra-cotta, and especially, as worthy of note, may be named the coat of arms and large crockets over the archways of the great gatehouse, and also the large stack of chimneys seen from the back of the house. Nearly three hours were most profitably spent here in sketching the old house and in examining the large barn in the yard adjoining, where much of the ornamental stonework from the ruins of Walsingham Priory are built in the walls, rendering the barn unusually interesting, as buildings of this class in Norfolk are usually of but a mean character. The programme arranged for Friday was, perhaps, lighter, and the buildings visited presented less of special interest than those of the former days' trips. The churches, however, were, with the exception of Deopham and Great Ellingham, of large size and varied detail, while the cathedral-like church of Hingham may probably be named as among the grandest of its size seen during the whole excursion. Wymondham parish-church of St. Mary and St. Alban was first visited. It is chiefly remarkable for having two towers, one square at the west end, the other being octagon on plan, and once forming the central tower to the church, while originally part of the Benedictine priory. The nave always seems to have been used as the parish-church, and in this form it is now used, the remainder of the priory being in ruins. The Norman piers and arches of the nave are interesting; but the former being cased with plaster-work, cannot be well defined. The triforium is of Norman date, with an Early Perpendicular clerestory over, the roof hammer-beams being in each intermediate case brought down on corbels, which form keystones to three windows' hoodmoulds. The main principals are carried by wall-shafts resting on corbels at level of clerestory window-sills. The roof is a fine example, with no queen posts, and having singular rose flowers or centres over the crossing of the several main timbers. The sedilia on the south side of the sanctuary is of rich Renaissance character in terra-cotta, and seems almost foreign in style. The font is a good specimen, and stands well at the west end; but, owing to the bad state of church matters at Wymondham, is not used—a paltry slop-basin in white ware being used instead, both the vicar and his curate finding it less trouble, it seems, to stand the basin on the font-steps, and so perform the Baptismal service as if the use of the grand old font itself had passed away. The church is crammed up with pews, and two velvet-covered cushions rest like sofa squabs on the altar. As seen either from the east or west, this church makes an uncommonly good subject either for a painter or architect's sketch. Attleborough Church is well kept, and seems well served. It was the next building visited, and is possessed of a fine rood-screen now placed in a curious and meaningless sort of way at the west end of the church. The east end or chancel of the church has been destroyed, and the tower, central originally, now stands as a parish-room on the ground-story east of the altar, which is placed against the west arch of the tower. The clerestory windows occur over the piers of the nave and not over the arches, and the celestory is low for so lofty a nave. A good eagle lectern remains, and a quaint old alms-box. The N.W. porch is a fine example of design in cut flint and stone. Full detail drawings were given in the monograph of St. Mary's Church, Attleborough, from drawings by Wm. Patton, architect, published by Canon Barrett in 1848—a book of much merit. Lunch was obtained in the house adjoining the church, and Great Ellingham Church was soon reached after half an-hour's ride. It is a very Kentish-looking building, with its lead-covered and well-proportioned spire. The nave arcade on the south side is a very fine example of Early English work, that on the north side being rather later in date. The clerestory windows, which are small but very good, come immediately over the piers, and there is no chancel arch. The windows in the chancel are unusually long, but exceedingly good in design. The building is unrestored, but not badly kept. Hingham, with its magnificent tower of six stages, is a boldly-treated church of the Decorated period, and has some splendid Dutch glass in the east window. The nave-roof is new, but is a good composition based upon studies of other similar Norfolk roofs. Mr. J. K. Colling was the architect from whose designs the nave was reseated and restored, and Mr. Arthur Blomfield restored the chancel with its altar, stalls, organ, and mosaic pavement. The latter is an exceedingly fine example of work of free and appropriate design, executed in good colours and spirit. The work was by Burke and Co., and does them credit. We do not like Mr. Colling's carvings on the nave-benches; the ornament seems meaningless and is poor in execution, unworthy of the author of "Art Foliage," &c. It is only on this account that we express our surprise at the unsatisfactory results here obtained. The fine recessed altar-tomb on the north side of the chancel, to Thomas, Lord Morley, Baron of Rye, though much defaced, is a most interesting monument, remarkable for its richness and originality. Some beautiful church music was rendered with much feeling on the fine organ during the time sketches were being made, and a very satisfactory day's excursion terminated by a short stay at Deopham Church. The roof here is in such a ruinous state that its dangerous condition renders it impossible to use the nave, so that the seats have been removed to the aisles, as the roof might fall at any moment. The vicar's efforts to obtain funds to save this sad calamity should certainly receive more help from those specially interested than it seems has, as yet, been forthcoming. The church, however, is very dirty, and this state of things the vicar could easily improve himself. The tower is a good example, having a gabled canopied belfry-stage, with woodwork to the doors both at the west end and south porch, of much beauty and refined detail. The final dinner of the excursion was held on Friday night, Mr. E. C. Lee, the president, in the chair, when Messrs. Phipson, John H. Brown, cathedral surveyor, and Mr. Boardman, architect, of Norwich, were among the guests. Congratulatory speeches were made, thanks being given to Messrs. Fowler and Penrose, the leaders of the party; and to Mr. Charles R. Pink, of Winchester, the hon. sec. to the excursion, for the admirable and complete way in which the whole of the arrangements had been planned as well as carried out. Also, a vote of thanks was cordially awarded to Mr. Wellard, who acted as quartermaster during the week to the comfort of everybody. Saturday was devoted to visiting the places of interest not yet seen in Norwich itself.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

In the *Proceedings* of the R.I.B.A., issued yesterday, it is announced that the Council have nominated Mr. John Macvicar Anderson, Member of Council, to fill the office of honorary secretary, vacant by the resignation and subsequent death of Mr. Thomas Henry Wyatt, F S.A., past-President. The election will take place on Monday, November 1st. Notice is given that, at the next examination of candidates for certificates of competency to hold the office of district surveyor, and at all future examinations for the same purpose, the examination will include some test of the candidate's skill in making working-drawings. The time allowed for written and graphic examinations will be extended from one sitting of four hours to two sittings of three hours each, namely, from 10 a.m. till 1 p.m. and from 2 p.m. till 5 p.m. The candidates will be required to leave the Institute during the intervening hour, and the questions set will be contained in two papers instead of one paper as heretofore. Due notice of the next examination, to be held Thursday, 28th, and Friday, 29th October, will be advertised. In the examination for the office of district surveyor, the following are the candidates who have passed and received certificates during the last session:—Ellis Marsland, Meynell-road, Hackney-common, E.; George Gray Jarvis, Talfourd-road, Peckham, S.E.; Walter Freeman, Edinburgh-terrace, Balham, S.W.; Wm. Hewson Lees, Doughty-street, Mecklenburgh-square, W.C.; Robert Edward Pownall, Aberdeen-place, N.W.; Thomas Edward Mundy, Buckingham-street, Adelphi, W.C.; Henry Adair Rawlins, Salters' Hall-court, Cannon-street, E.C.; Hugh McLachlan, Redcliffe-street, South Kensington, S.W.; and Arthur Ashbridge, Leadenhall-street, E.C. In the architectural examination, the names of the passed candidates in the class of proficiency, 1880: John Bradshaw Gass, Bolton; F. T. Wilberforce Goldsmith, Newport, Mon.; Frank Johnson, Nottingham; Henry Hardic Kemp, Bowdon, near Manchester; Philip James Marvin, Camden-street, N.W.; and Lawrence George Summers, Nottingham.

The passed candidates in the preliminary class, 1880, are:—Edwin Hubert Dance, Upper Hale, Farnham, Surrey; Edward Guy Dawber, King's Lynn; Ernest Herbert, Brixton, S.W.; John Ernest Kingham, Farnham, Surrey; and Roger Elsey Smith, Forest-hill, S.E. It is reported that three honorary fellows, 18 fellows, 43 associates, four honorary associates, and one hon. and corresponding member have been elected to membership during the past session. The late Mr. T. H. Wyatt was President of the Architects' Benevolent Society, and the Council of that Society have requested Mr. John Whichcord, P.R.I.B.A., to act as chairman till the annual meeting in March, 1881.

ST. PAUL'S CATHEDRAL—SETTING OF STONEWORK.

The maintenance and reparation of old buildings need a good deal of close supervision and examination, and our great public buildings, especially our cathedrals, have, happily, during this age of restoration, been placed under such surveillance, that those intrusted with the supervision of their fabrics exercise a vigilant care and a very pardonable amount of pride in keeping them in perfect order, and in examining every stone or dowel which has a doubtful appearance of durability. But even with the most careful watchfulness, sometimes a part of a building hidden from sight eludes examination. In the preservation of a large structure, a great deal more than superficial surveys are required. It is not always the detection of decayed stonework on the outer face of a building that needs the first attention, though a crumbling state of decay gives a ruinous and uncared-for look to a building. There are more deep-seated maladies than this, and there is often a danger lest these hidden defects prove to be sources of danger and instability. A building of great weight must always be in a state of settlement; underground springs, soakage, and the diversion of water-courses have been known to undermine buildings, while in large cities, such as London, the constant alterations of adjacent property, the removal of weighty buildings, and especially the tampering with the ground by the excavations of new sewers, &c., create an endless source of mischief. Large porticoes, such as that at the west end of St. Paul's Cathedral are more likely to settle than a homogeneous mass of masonry like a wall, and in the course of three centuries it would not be surprising if the axes of some of the end columns were thrown over a trifle in consequence. Any danger from such divergences need not be feared, as the settlements are too trifling; but they occasionally give rise to cracks and dislocations of different kinds, which the surveyor, by a careful diagnosis, is enabled to attribute to its proper cause. A contemporary has recently called attention to a giving-way of the stonework in the upper part of one of the fluted Corinthian columns supporting the west portico of St. Paul's Cathedral which had been discovered on a recent survey being made of the cathedral. Such an announcement would be alarming enough to those who, when they see a fractured column or a crack, think the whole building is in danger; but the actual fact, on the contrary, is one that need not give rise to any uneasiness. From a casual inspection we find that a fractured portion of the upper stone of one column is being replaced. The column in question is the third one from the south side, in the lower range of columns of the portico. As most of our readers know, the western portico of St. Paul's consist of two orders of columns, the upper order carrying the pediment being of eight coupled columns, and the lower order extending an intercolumniation on each side, making twelve columns coupled. The column that is now under repair is therefore below the outer column of the upper range on the south side, and its base rests on the upper landing of the second flight of steps. From what we hear, it was found that the upper courses of the column at the joint were slightly out of position; in fact, that two portions or fractured prisms had bulged a little at the joints, and it was thought necessary to replace the cracked parts. The fractured prism which separated from the upper course of stone is not more than a fourth of the mass, and it has separated in an oblique plane with the sharp angle downwards, as usual in cases of crushing short cylinders of stone. The pressure on this column was probably never equal; that is to say, the inequality of a stone may have thrown the weight on the side which has fractured, or the stone may have been inadvertently placed on its wrong bed. The fractured prism we saw getting hauled up appeared as sound as new stone, indeed, harder, and will be replaced in its old position again, and no one will know that anything has been done to it. Perforations have been made in the fractured pieces, and no doubt copper bolts will be inserted through the whole course; they have been eased at the joints, and the column will then be sounder than it has been for the last century or two. It is unnecessary to refute the assertion that the structure has been at all endangered; the fractured pieces of stone which have been secured do not affect the strength or support in any appreciable degree, as the remaining part is sound and occupies two-thirds or more of the diameter of column. Of course the main pressure on a column thus situated would be through the axis, and this part is quite intact. The fracture, trivial as it is, in reference to St. Paul's, has a lesson for the architect and mason. It might occur to an outer column with more dangerous results, or it might have taken place in a single column supporting another above it, and then some caution in replacing the stone would have been necessary. In the present case, luckily, the columns are in pairs, and ample support is afforded. But the construction of modern buildings is not always carried out with the consummate care exercised in the building of St. Paul's. In the first place, the foundatians of single outer columns are not securely laid so as to insure a perfect transference of the weight; in the next place, if of stone, the stones are not personally examined and tested under pressure as they should be; in fact we have never known of an instance where the stones have been specially tested: their soundness and freedom from vents or flaws, veins, &c., is usually guaranteed by the foreman or clerk of works, and it is to the practical experience of those gentlemen we have to trust in most cases. Of course in the selection of stone in the quarry much depends, but a great deal more in the supervision of erection—to see, for instance, that the natural beds are in their proper position. Then there is another common fault—the erection of columns of stones without inserting some compressible substance like lead between the joints. Many of our modern porticoes have suffered from inattention to this point, and the consequent flushing at the joints. Referring to the resistance of stone, it may be said that as the greatest weight upon it is usually never sufficient to fracture it, we need not trouble; but such an assertion is unreliable in many cases, as when any natural fault occurs in the stone; and we believe it is stated that the greatest stress on any part of the masonry at St. Paul's is about 14 tons per square foot.

THE TOTTENHAM-COURT-ROAD GAS EXPLOSION.

THE report has been issued as a Parliamentry Paper, prepared by Mr. A. G. Vernon Harcourt, one of the gas referees to the Board of Trade, of the circumstances attending the explosion of gas in the Tottenham-court-road, on July 5. Mr. Harcourt says: "Although, in my opinion, the responsibility for the explosion and the destruction caused by it rests almost exclusively upon the ignorance or thoughtlessness of the contractor's foreman, the explosion would also have been averted if the connection in Bailey-street had been made before that near the Howland-street valve. A suggestion was made that the gas which exploded may have found its way into the new main from the earth in which the main was laid, in the same manner in which a subsoil drain becomes filled with water. This would no doubt be possible with a leaky main in the neighbourhood of another leaky main charged with gas. But in the present case the main was all but gastight, and no evidence was given of the presence of gas in the subsoil in sufficient quantity to inflame or explode. Unless the atmosphere of the subsoil contained gas in sufficient proportion to form an explosive mixture such a mixture cannot have passed from it into the main. As will appear from the consideration of the small amount of leakage sufficient to produce an explosive mixture, there is no reason to doubt that the gas which exploded entered from the valve in Howland-street. Probably, therefore, no accident would have occurred if the connections in the immediate neighourhood of the valve at each end of the new main had been deferred till last. If the main had been laid only one or two lengths beyond the valve and then plugged a pressure-gauge attached to a stand-pipe would soon have shown even a minute leakage in the valve. This could not be the case with a main extending for many hundred yards. The reasons are (1) that the pressure shown is that due to the difference between the leakage at the valve and the leakage in the main; (2) that the time required for the accumulation of any given pressure within the main is directly proportional to its capacity, the danger of unplugging a short length of main of large diameter into one end of which gas was slowly leaking from a valve would be inconsiderable. Such a length would soon cease to contain an explosive mixture, the rate of ventilation greatly exceeding that of leakage. In the present case the leakage had charged 690 yards of main with an explosive mixture. If no light had been applied in testing, and the main had been unplugged, the explosive mixture would have streamed outwards from the upper part of the main, and several hours probably would have needed to elapse before the risk of explosion by the accidental application of a light to the mouth of the main had passed away. Mr. Hersey stated at the inquest that he had seen gas accidentally lighted by a spark from a pick. As, however, the smell of gas on unplugging the main would at once have given warning, the actual risk in this case would have been very small. But besides the causes named, another was in operation which must have caused the explosive force to have been greater at some points than at others. When the plug was blown out a wave of compression was sent in the opposite direction along the column of gas, which must have rebounded from the bends in the main and from the valve which closed it. The return waves would meet the advancing fire, and at these points the strain would be greater from the ignited mixture being at a higher tension. Each outburst would cause a fresh oscillation and fresh coincidences of the combustion with reflected waves of compression."

PNEUMATIC BELLS.

PNEUMATIC arrangements for working bells or other signals have come into considerable favour; but one drawback is found in the frequency with which the air-holders are damaged or are rendered useless. The air-vessel is usually oval in form, with a small tube projecting from one side for connecting to the air-pipes; it is frequently provided with a spring inside to return the pusher, and almost invariably retains within it some acid deposit, resulting from the processes of manufacture. The consequence is that not only does the rubber soon become hard, and consequently useless, but where springs are used, the wire is rapidly corroded, and, breaking, often perforates the air-vessel. Mr. Arthur Clarke has patented an improved form of air-vessel, which obviates the defects of the old form. He makes his air-vessel cup-shaped—that is, entirely open on the flat side (so that it can be readily and thoroughly cleaned out before being fixed for use), and of such a shape and thickness that it will not collapse with usage. He also dispenses with the spring inside the air-holder, except for long distances, when a pull handle is used; a spring is then applied inside the air-holder, but does not touch it in any part. The cup-shaped air-holder is closed on the flat side by a plate of metal or wood, against which the edges abut closely without being clamped thereto. The plate may be the top or bottom of the box in which the air-holder is contained. For short distances the air-tube communicates with the interior of the airholder through this plate. For long distances the airholder is open to the atmosphere through holes in the plate, and the air-tube communicates with the metal box in which the air-holder is contained, so that in either case no binding or other form of metal connection with the indiarubber is necessary. This arrangement also dispenses with the use of valves to prevent the return of air in long pipes, for the inventor makes a pin-hole in the tube close to the air-vessel of the bell or indicator, and then when the air-holder is pulled up, it creates a partial vacuum, or rather in-draught at the pin-hole, while the release compresses the air and rings the bell, the surplus air escaping by the pinhole.

A MONOGRAPH OF ASTON HALL, WARWICKSHIRE.*

MR. W. NIVEN, architect, has just brought out, as a supplementary volume to his "Old Warwickshire Houses," noticed by us some time since, a "Monograph of Aston Hall," including geometrical drawings and views, for which the Institute of British Architects lately awarded him their medal. The volume is prefaced by a brief historical sketch and description of Aston Hall, reprinted from the former work of Mr. Niven, just sufficient to refresh the memory of the reader or visitor. Aston Hall can claim, like many other of our great domestic buildings of its age, a respectable antiquity. Even before the Norman Conquest, there was a stately Manor-house at Estone, as it was called, the property of Edwin, Earl of Mercia. King William bestowed it on William Fitz Ausculf, whose principal seat was the Castle of Dudley. After passing through several generations, we find that in 1367 it was conveyed to John atte Holte, of Birmingham, by Maude de Grimsarwe. "John, having no issue, was succeeded by his uncle, Walter atte Holte, and with his family, with only one temporary alienation, the estate continued till near the end of the eighteenth century." The present hall was built in 1618, and was completed in 1635, by Sir Thomas Holte, who resided here. Justice Holte, a learned lawyer in the time of Henry VIII., was also a member of the Holte family, and his brass may be seen in Aston Church. We read that Sir Thomas was loyal to the Stuart cause, and, in 1642, he entertained Charles I. when his army was marching from Shrewsbury to relieve Banbury Castle. The room which he occupied is still known as the "King's Chamber," and the attack on the Hall may be remembered by the student of the history of this interesting period of our English annals. In 1782, the title becoming extinct, the estates reverted to Mr. Heneage Legge; in 1817, the pictures and furniture were sold, and, in the next year, the Hall and Park were bought by a banking firm of Warwick. The Aston Park Company continued its possessors for some time, till the Corporation of Birmingham purchased the Hall and part of Park of them for £26,000. Mr. Niven's drawings illustrate the Hall pretty fully. The plan is drawn to a small scale, about 20ft. to the inch, but adequate for all purposes of reference. There are fifteen plates in all, neatly etched by the author. The first plate would, perhaps, have looked less crowded if the plan had been placed below the general view, instead of above it. The elevations of the main and south front are effectively drawn, and make up for any shortcomings in the small view. The grand old entrance-hall, 47ft. by 24ft. internally, with its lofty mullioned windows and columnar porch, is well shown in the main elevation; and the author gives large-size details of the main entrance, great staircase, and a sketch of its fine geometrical ceiling, though it is almost a pity that the stuffed rhinoceros and giraffe should have been introduced in the view. No detail of the hall-ceiling is given; but the staircase is illustrated by a plan and section and a plate of detail, showing the beautifully and quaintly-carved newels and strings, and the rich scrollwork panels of the balustrades. The newels, with their handsomely-designed terminals, with the Ionic capitals and the rich arabesques in the sides, are probably among the finest examples of Elizabethan workmanship to be found in England. The author says:—"The staircase seems to have been formerly painted in a dull red and grey; but, having been since painted white, all the colour has now been removed from the wood. A rude imitation of the balustrade was painted on the wall side of the stairs. The resemblance in detail of this staircase to that at Crewe Hall is very striking, and this, with other points of similarity, has led Mr. C. J. Richardson to pronounce these two houses and Dorfold Hall to be by the same architect." The great drawing-room over the chapel, an apartment 39ft. by 23ft., and 17ft. high, called the "Queen's Room," is illustrated by a large detail plan of the ceiling, another beautiful example of plaster work of geometrical design, relieved by scrollwork and masks. The pattern consists of intersecting circles, leaving oval panels, with small circular panels at the points of intersection. The fine chimney-piece of white stone, black marble, and alabaster, is illustrated, and is carefully drawn in the details; it is of two orders of telamones, and the frieze of the mantel is an elaborate piece of Elizabethan ornament. The deep frieze round the room, modelled in plaster, enriched by figures of warriors in relief, is shown in another plate. Bold Renaissance scroll ornaments, alternating with niches containing figures clad in armour, are the principal features of this fine frieze. The ceiling of King Charles's bedroom is another unique specimen of plaster relief; squares and circular forms prevail, with the characteristic scroll ornaments in the panels. These rooms were, doubtless, as the author says, hung with tapestry, or painted on the walls. King Charles's room is square, 18ft. each way, and 12ft. high, with a recess formed for the bed. Plate 13 shows a handsome stone chimney-piece in the "Red-room," or Cleopatra's room, over the hall; and Plate 14, the chimney-pieces in Lady Holte's, and one of the bedrooms over the hall. The details of the mouldings of these chimneys form the last plate. One of the best etchings is that of the view on the stairs, showing the doorway of great chamber, with its wide and massive architrave, enriched by guilloche ornament, and surmounted by the characteristic scrollwork of the period. In the details of this stately Hall the student cannot fail to observe a difference in the style of some parts. Probably, as Mr. Niven tells us, the chimney-pieces are not all of the same date: the earlier may have been brought from Duddeston, a former residence of the Holte family. We are glad to learn that both brick and stonework are, on the whole, well preserved in the front; but they will soon begin to suffer if, as Mr. Niven says, the smoke from the Birmingham chimneys has so begrimed the building. Altogether, Mr. Niven's monograph is a welcome addition to the architectural records of this famous Hall, and the etchings, executed from careful drawings made by the author himself, insure for it an accuracy we do not often find in the older illustrated works of this class.

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* Monograph of Aston Hall, Warwickshire: Geometrical Drawings 'and Views, for which Medal of R.I.B.A. was awarded. By W. Niven, architect. London: J. Rimell and Son, Oxford-street, &c.

THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

WE hear that Mr. Charles Barry's report on the designs submitted for competition for the new municipal buildings for the City of Glasgow has been made to the Corporation. The designs will be on view at the Corporation Galleries, Sauchiehall-street, Glasgow, to competitors and the Press on the 6th prox., and to the public from the 13th to the 18th prox. inclusive. We shall in due course examine and report on the designs. We have several letters to hand this week from competitors, and others, complaining of the delay which has taken place in the publication of Mr. Barry's report. Rumour is busy, both in London and Glasgow, as to its tenor, and it is generally believed that the first and second premiums have gone to Glasgow architects. The first place is assigned to a design in the French Château style, by a well-known Glasgow architect; and the second, to a design bearing the motto "Civis Sum," in the Roman Classic style, and evidently inspired by a well-known church in Venice. Another plan, bearing the motto "Aiblins," may, possibly, be an alternative design by the author of "Civis Sum," though we think not; it has, at any rate, a good deal in common with the first-named design, though stronger in some of its details.

BOOKS RECEIVED.

Notes on Sketching Tours, by an Architect (London: B. T. Batsford), is a good, cheap, and seasonable half-crown's worth. Students in search of a route may consult its pages with advantage, and those unable to make holiday may study the examples, and wait for a more auspicious opportunity, better prepared.——*Minor Arts*, by C. G. Leland (London: Macmillan and Co.), is another volume of the "Art at Home Series," which professes to teach in a simple practical manner the processes of several minor decorative arts which may prove sources of profit or culture. We opened the book with some misgiving, having little more faith generally in such manuals than in the advertisements in the daily papers, which offer remunerative occupation to persons without previous knowledge or experience—always only after money has been paid for a short course of lessons; but Mr. Leland's book is really likely to be useful, and to encourage hand-work, in connection with which he points in his preface to a fact which we have more than once dwelt on, viz., that the current system of buying goods on credit by the consumer is very injurious to art. "It is not true," says Mr. Leland, "that a tradesman or mechanic is incapable of becoming an artist. I have found him as a rule ambitious and capable, but always kept back and discouraged by the delay (in payment) which maketh the heart sick, and thereby encouraged to supply cheap stuff."——*Transactions of the National Association for the Promotion of Social Science, for* 1879 (are issued too late to be of much use or interest to anybody. People that care for the Society's proceedings are thinking of this year's meeting).——*Bevis's Builders' Price Book, Midsummer Edition* (London: Bevis and Co.) seems to increase in size and favour with each edition, and fully deserves the position it has so quickly made for itself.

Building Intelligence.

Buckingham.—New schools for 300 children have just been completed, consisting of two departments arranged in a T form, viz., a schoolroom 44ft. long, fitted up with galleries and desks, for 120 infants, and another schoolroom, for 140 boys and girls, 67ft. long, with a class-room, for 40 children, 20ft. long attached, and both fitted with deal desks. All the rooms are of the same width (22ft.) and height (14ft. up to plate, and 28ft. to ridge), the roofs being of open timber description, with arched principals and plastering between rafters. The walls are formed of hollow brickwork, and a course of gas-tar and slate has just been put throughout them at level of ground. The red brickwork has been relieved by white bricks of both a plain and ornamental character, as well as other red ones of a deeper tone, and blue Staffordshire ones for the more exposed surfaces, such as water tables to chimney stacks and buttresses. The roofs are covered with brown and blue Broseley tiles, and the ridges with Cooper's red ornamental crests. Each room is provided with a ventilated spirette, having plate-glass louvres finished by one of Macfarlane's iron terminals, the one over the class-room being utilised for the bell, provided by Mr. J. Barwell, of Birmingham. Elsley's patent ventilating grates are adopted throughout, and the hearths and curved fenders are cut of solid blocks of Yorkshire stone. The works have been carried out by Messrs. Marshall and Boyse, of Buckingham, at the very moderate cost of £2,240, from the designs and under the superintendence of the architect, Mr. E. H. Lingen Barker, of London, Hereford, and Tenby.

Dudley.—The Mayor of Dudley on Monday opened new public baths erected by the town council at Queen's Cross. The building consists of the bath premises and attendants' house, and comprises two swimming-baths, a number of private baths for men and women, attendance-rooms, ticket-offices, store-rooms, engine-house, laundry, and drying-rooms (over the boilers), and care-taker's house. The swimming-baths are 104ft. in length and 30ft. in width. The architects are Messrs. Davies and Middleton; the engineer, Mr. A. Smith, M.I.C.E.; and the builders, Messrs. Holland.

Erlestoke.—A new church has been built at the edge of the Park skirting the road at Erlestoke, Wilts. It is Perpendicular Gothic in character, and has been designed by Mr. George Edmund Street, R.A. The building consists of a nave, north aisle, chancel, south transept, vestry, tower and porch. The nave measures 48ft. by a little over 21ft. wide, and the chancel is 26ft. by 17ft. 6in.—making a total length of 74ft. The height of the tower is 45ft. to the line of its parapet, and it is surmounted by a sharp-pitched roof. The whole of the roofs generally are covered in with plain red tiles, made by Mr. Box, of Market Lavington, surmounted by crestings by Cooper, of Maidenhead. The building is built of Box-ground stone throughout—not only in the dressings but the walling as well—all the Box stone, after being faced up, is left "batted" from the tool, and in no instance is it "dragged" or rasped up to an affected smooth surface. The interior walls, like those outside, are all of solid Box-ground stone, tooled over. The church is heated by Messrs. Jones and Son's (of Bank Side, London) system of hot air. The carved work has been executed by Mr. Harry Hems, of Exeter. The builders are Messrs. Hale and Son, contractors, of Castle-street, Salisbury, and their managing foreman on the spot was Mr. William Cowley. Mr. Street has been represented by Mr. Thomas Chapelow, his clerk of works. The cost of the church is rather over £6,000, and it is anticipated that it will be opened in September. A new parsonage, in the Domesticated Gothic style, has been built also from Mr. Street's designs, and by the same contractors. It is approaching completion.

Newcastle-on-Tyne.—A new Jewish synagogue, at Newcastle-on-Tyne, was opened on Tuesday. Mr. Johnstone, of Newcastle, was the architect. The style is Free Byzantine. The walls are of a composite character, but with rubble and blockstone dressings from quarries in the district. The front, facing Albion-street, is more than 80ft. long, and has six piers in its length, enriched by bands, string-courses, and capped with ornamental turrets, with angle columns and terminals. The basement, which is carried down throughout the whole area of the building, has two entrances from Albion-street and one from Leazes-lane, and contains boys' and girls' school, committee-room, bath-room, waiting-room, &c., all well lighted and ventilated. The height is 12ft. from floor to floor. The synagogue is 60ft. long from front to back, by 50ft. wide, and 43ft. high from floor to top of circular ceiling. The ground floor will contain sittings for between 300 and 400, and the gallery for between 200 and 300. Thorough ventilation is gained by horizontal chambers running the whole length of the building, rising and converging towards two large Boyle's ventilators. The ark, designed by the architect and executed by Mr. Turnbull, of Newcastle, is of fancy wood, richly carved. The whole of the building has been undertaken and carried out in the best manner by Messrs. T. and R. Lamb, of Gateshead.

Rock Ferry.—A new high altar has been presented to St. Anne's Catholic Church, Rock Ferry, by a Catholic resident of Rock Ferry, and was consecrated this week. This church, the late Edward Welby Pugin's last architectural work, is one of the most striking specimens of pure Gothic architecture in the neighbourhood of Liverpool; and the altar is from the designs of the architect's brother. One of the great features in it is the tabernacle and centre canopy; the latter rises to a height of 24ft., and is supported by a richly-cusped arch on marble columns. The sides are composed of canopies 20ft. in height, on either side of which are gablets, supported by trefoiled arches on marble columns. Under these are three groups of angles adoring. The tabernacle is elaborately wrought in alabaster; above the door is the word "Sanctus"; immediately over this, in a trefoil sinking, there is a pelican, one of the emblems of the Blessed Sacrament; on the other sides are two other trefoil sinkings with other emblems—the Passage of the Destroying Angel, and the Manna in the Wilderness. The columns in the tabernacle are of Mexican onyx. In the panels on either side of the tabernacle are four quatrefoils filled with marble, on each of which there is a pattern sunk and gilt. The altar-slab is of marble, supported by four columns of California marble on alabaster bases. Below the altar there is a carved panel of the Last Supper. The super-altars are of marble, supported on either side by two marble columns, between which there is a panel of four quatrefoils, filled with coloured marbles. The chief part of the altar is of Caen stone. The steps to the altar are of Sicilian marble. The whole has been carried out from the designs of Messrs. Pugin, by Mr. R. L. Boulton, sculptor, of Cheltenham. The metal tabernacle and also the curtain cranes, which are on either side of the altar, are from the works of Messrs. J. Hardman and Co., of Birmingham.

Truro Cathedral.—The works at St. Mary's New Cathedral are being steadily proceeded with under the direction of Mr. James Bubb, who represents Mr. John Loughborough Pearson, R.A., on the spot. The excavating for the choir foundations continues; it is proposed to go down about 5ft. below the level of the crypt floor. At the east end the concrete footings are in up to that line. A scaffold has been erected around the spire of Truro old church. This spire is 120ft. high, and as it was only erected so recently as little more than 100 years ago, it is not of particularly good type; but its stones are, some of them, large, and will require care in removal. It is not yet decided where the clock and chimes are to be placed *pro tem.* In the design a small tower east of the central one, and at the south side of the choir, is planned to take these bells ultimately. Should funds come in as hoped for, the choir—the cost of which will be about £35,000—will take four or five years to erect.

PARLIAMENTARY NOTES.

The Lower Thames Valley Drainage.—Mr. Brodrick asked the President of the Local Government Board last week whether, considering that the inquiry of the inspectors into the Lower Thames Valley drainage scheme terminated nearly three months ago, and that the scheme was condemned by a vote of the House of Commons last session, he could give a guarantee that the decision of the Local Government Board should be announced at a time when the attention of Parliament might be called to it.—Mr. Dodson: I cannot guarantee that the decision of the Board shall be announced before the close of the session, as I must have time to master the voluminous evidence, and it would not be fair towards the parties interested to keep them in suspense until next year. If, however, the Board should decide to grant the provisional order applied for, the order would have no validity until confirmed by an Act, so that ample opportunity will be afforded for its consideration by the House.

Builders and the Employers' Liability Bill.—Commenting upon this Bill, which was read a second time in the House of Lords on Tuesday, the Duke of Somerset said there were one or two points in the Bill which were scarcely clear. If, for instance, a man employed a contractor to build a house, and one of the contractor's labourers dropped a brick upon his fellow workman, he did not quite understand whether the contractor would be liable or not. He desired to see the responsibility of employers limited to the acts of persons as to whose authority there could be no doubt—persons who were directly authorised by the employers themselves to act for them.

The Tottenham Court-road Explosion.—It is stated that, at the instance of several metropolitan ratepayers' associations, a Bill has been prepared and will be introduced by a private member at the beginning of next session of Parliament, having for its object the compelling of gas companies to meet all claims for compensation arising from catastrophes of a similar character to the recent gas explosion in the Tottenham Court-road, London. The gas companies interested in this catastrophe are meeting all claims for personal injuries in a liberal manner, and are repairing at their own expense the damage done to upwards of 200 houses, but they deny their legal liability to do so, owing to the wording of their policies, which they assert entirely exempt them. The Bill referred to has been prepared to meet exceptional cases of this description.

CHIPS.

A new Primitive Methodist School Chapel, at Sheffield, was commenced on Monday. It will be 70ft. long, 31 wide, and 14ft. high to wall plate, and will accommodate 300 scholars. The architects for the building are Messrs. Jas. Kerridge and Sons, Wisbech; the contractor, Mr. James Fidler, Eckington.

Mr. Baker and Mr. Barlow, jun., have just made an examination of the River Tay, in view of the preparation of plans for the reconstruction and rebuilding of the Tay-bridge. They fixed on a site to the westward of the bridge, and are to sink an experimental cylinder by means of air-pressure to the depth of over 20 feet below the present bed of the river, so that the nature of the strata may be ascertained. The work will be proceeded with without delay.

Mr. E. C. Buchanan Tudor, engineer and surveyor to the Poole Local Board, has introduced a mode of improving the lighting of footpaths and streets by the use of the existing lamps, but glazed in a different manner. He claims double the light from the same burner with a less consumption of gas.

A new organ, in St. John's Church, Lowestoft, erected by Messrs. Marten and Taylor, of London, at a cost of £500, was opened on the 19th inst.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Correspondence.

THE LONDON WATER-SUPPLY.

To the Editor of the Building News.

Sir,—The Select Committee of the House of Commons have issued their report on the London Water-supply, and which, in no measured terms, condemns the Bill of the late Government. As I have again and again said, and as the committee now reiterate, the agreements proposed to be entered into with the water companies by the late Mr. Smith were founded in error, and were, in many particulars, of so reckless and speculative a character, that it was scarcely possible for any body of gentlemen sitting in judgment upon them to come to any other conclusion than that "they do not furnish a satisfactory or admissible basis of purchase." The unsatisfactory nature of the proposed arrangements is the more apparent as it is brought to the light and more closely examined. It is seen also that the sum proposed to be paid to the companies is a good deal in excess of an estimate I made in April last, and which must now be taken at £33,018,836. The bugbear of "economisers" came to nought, and it is fairly estimated that the ratepayers were about to be saddled with an enormous annual payment, in perpetuity, of £1,240,763. Under the circumstances, it might almost appear to be unnecessary to point to the fallacy of Mr. Smith's facts and figures, as these must have been founded on the principle of paying twice over. First, in the way of immediate annuities, in consideration (as he puts it) of existing net income, and, secondly, by way of deferred annuities for some supposed and unascertained and prospective advantages, which, in the eyes of the Committee, as to men of business, are "to a great degree, of a speculative character."

So, too, with regard to the calculations of increments founded on the assumption that all the items of receipts would grow at a greater rate in the future than in the past; that the number and value of the houses and the rate of the rentals would perpetually augment, whilst the growth of capital expenditure which has hitherto been required in order to earn an increased income, would sink almost to nothing, and might therefore be discarded from the calculations. This, as the learned counsel for the Corporation said, was proceeding with a determination to "buy up the eight companies—reasonably, if you can; but buy them." Another claim set up by the companies, and apparently conceded without question by Mr. Smith, was that of a further increase in rates in proportion to the growth of the rateable value of houses. This right was claimed without any kind of "legal relation to augmentation in the quantity or improvement in quality of the water supplied." If, argue the committee, "the water companies were limited in the amount of dividend they could earn, as was contemplated by the Water Act of 1847, there might be some reasonable restraint on their power to enhance the charge against the consumer. The companies, however, assert their right, under the title of back dividends, to escape from any such limit, boldly making this supposed right one of the grounds for demanding so high a price from the public for the purchase of their undertakings." Mr. Smith estimated this newly-acquired right at twenty millions. Mr. Michael, however, denounced this bit of sharp practice as an utter delusion.

The Act referred to precludes any company incorporating these clauses from dividing more than 10 per cent. from the period of incorporation. In this way the New River Company could only have back dividends accruing from 1852, and the total amount of their claim in that respect was £1,500,000, which might accrue from the present time, seeing that that they were paying £9 19s. 7d.; but Mr. Smith had given them £2,000,000 for that. He contended further that all the companies had forfeited their right to back dividends, and especially in the case of the New River Company, which, after incorporating the Waterworks Clauses Act, had illegally created a reserve fund, which they had used to equalise dividends. Provided, then, that the contention of the companies was well-founded, the metropolis, with its four millions of inhabitants, would be "at the mercy of certain trading companies, armed with the dangerous power of raising the price of one of the first necessities of life to an extent practically without limit—a situation from which the companies seem to think there is no escape, except in the purchase of their undertakings at such a price as they may be willing to accept." "If," said the committee, "that were the only remedy, the consequences to the consumer of the improvident legislation of the past would be indeed intolerable; but Parliament is not unequal to redress such mischiefs to the public interests. The manner in which the gas companies have been dealt with by Parliament may be referred to in illustration of the method by which a remedy for such a state of things may be effectually provided."

It will, then, surprise no one to find that, as the agreement stood, the price to be paid to the water companies was, after making a very liberal allowance for works which were already useless, or in a short time would become so, nine millions in excess of the market value of the property.

The shareholders of the water companies have doubtless cause for complaint; for between Mr. Smith, who had no previous acquaintance with such transactions, and Sir R. A. Cross, who was bent on a piece of sensational domestic legislation which should, in some way, hand his name down to posterity, they have suffered from all the miseries of Tantalus, for no sooner did the then Home Secretary dangle the golden fruit before their eager eyes, than it was destined to be cruelly placed beyond their reach, and now it appears doubtful whether they will ever enjoy it, by reason of the ratepayers having asked themselves the question whether it is worth while to purchase an article which may turn out to be dear at any price.

It is an incontestable fact that there is not enough water, and what there is is not nearly so good as it ought to be and might be. This being the actual condition of the water-question, price may, after all, be looked upon as quite a secondary matter. Most assuredly the health of a community numbering four millions is of far greater importance, and, for this reason, it has already caused surprise and regret amongst the medical profession when it came to be known that the Select Committee had concluded their labours without admitting or calling for evidence upon the most important part of the question—that of finding a purer and better supply of potable water. The Committee are strictly within the mark when they say "They have not had before them any specific scheme for an independent supply, and that general speculations on the subject are of little value without detailed plans of the sources from which it is to be derived, and the cost of carrying it into effect." The Committee are themselves to blame for this. I can confidently state that pressing applications were made, both to the committee and its chairman, to admit evidence on an independent and purer supply, and the fullest information was prepared and forthcoming at any moment. One witness was ready with proofs that the Chiltern Ridge might be depended upon as an almost inexhaustible source of supply.

The water here is running to waste and overflowing the Colne valley above Watford, and its purity has long attracted the attention of engineers and sanitarians. Robert Stephenson some forty years ago was at much pains to bring this Watford source to the notice of successive Governments, but to no purpose. So confident was he of the water-bearing capabilities of the chalk strata around London, that he went to the trouble and expense of sinking, first a well in Bushey Hill meadows, near the Colne, and subsequently at other spots. When he had attained a depth of 34ft., he obtained 1,091,000 gallons a day. Upon extending his borings, he came across a constant recurrence of large springs, and on reaching to a depth of 80ft. they yielded a supply so bountiful as to set all temporary means of overcoming it at defiance, and precluded the possibility of having recourse to it as a mere matter of experiment. Of its purity there was abundant ocular proof, as it was so beautifully transparent as to admit of the bottom of the well being seen when the water in it was upwards of 30ft. deep. So earnest was Stephenson in the matter, that he sought the advice and assistance of Telford, and together they "drew out plans, and marked out the course of the aqueduct which was to bring the water to Brockley-hill, there to be poured into a reservoir, holding a three days' supply, with sufficient head to admit of a main being laid, so as to avoid all opposition from landowners." The great advantages of this scheme, as set forth by Stephenson, were, "that of using spring water, already naturally filtered, in preference to that which has before drained a portion of the earth's surface, in making use of an enormous reservoir of water which Nature has stored up in the chalk, and effecting this at a spot where no existing interests can be injured, and in the selection of a situation whence a bountiful supply may be conveyed to London with facility and economy, and at a sufficient elevation to meet the demands of the highest parts of the Metropolis."

Since Stephenson's time water engineers have constantly appealed to his results with a view of affording a good water-supply to London. In 1841 a company was actually projected for the purpose of giving effect to Stephenson's recommendation; but the established water companies successfully resisted the progress of the Bill through Parliament. The Bushey Meadows are situated in the valley of the Colne, and are surrounded by bare chalk hills, which vary from 500 to 900 feet in height. The chalk appears a few feet below the surface, and large fissures are seen at intervals varying from 12in. to 12ft. in depth; in boring, approach to these fissures is indicated by the hardness of the chalk, and when this is fairly penetrated, the chisel suddenly descends into a cavity charged with water, which immediately gushes up to within a few inches of the surface, although the level of the ground is 169ft. above Trinity high-water mark. With a body of practical facts of a similar kind before us, there can be no doubt that the chalk formations round London will afford any amount of pure water, and that this can be easily and cheaply obtained. The estimated cost at that time was set down at a million and a quarter (£1,250,000).

A word on a recent discussion in the House of Lords on the water-supply. A good deal was said on, and endeavoured to be made out of, the storage of water in cisterns. I refer to this, because, for some reason or other, the companies and the Water-examiner appear to attach a good deal of importance to it, and make it a constant subject for comment, and it is one that can be made to tell in the companies' favour, when the quality of their water is brought into question. The constant-supply system, however, is rapidly taking the place of the cistern system, and all but two of the companies—the Southwark and Vauxhall—have already placed a large number of their customers on a constant supply. As many as 80 per cent. of the East London Water Company are already so served; but I am quite unable to discover that the constant-service system has in any way had the effect of diminishing diarrhœa and summer cholera at the East End, or of reducing the death-rate from diseases always largely on the increase when the temperature of the Thames and Lea waters rises above 60° Fahrenheit. Admitting, however, that house-cisterns are the cause of a good deal of illness in lodging-houses, I cannot shut my eyes to the fact that the quality of the water delivered by the companies is in the first instance greatly deteriorated by the mode of collecting and storing it. The water, drawn from the Thames in a very discoloured and muddy state, is received into open cisterns or reservoirs, officially described as "subsiding reservoirs," covering from twenty to thirty acres of land. The sides and bottoms of these reservoirs are composed of bare earth; and are consequently covered with tons of decaying vegetable and animal matter, and the action of light and air renders this offensive to the nose, and even in the filtered waters of the companies I always find a quantity of animal and vegetable life, and when seen in bulk, the colour is most uninviting, sometimes quite repulsive.

The necessity for an immediate supply of more wholesome water in London is more than ever apparent. In the south of London the inhabitants are wholly unable to procure any but dear and polluted Thames water. It is a satisfaction to know, however, that since I directed public attention, through your columns, to the dangerous quality of the subsoil water the Lambeth Water Company were pumping "within their properties," at Molesey, the Local Government Board have stepped in and ordered the Company to discontinue any further use of this water. Parliament, rather than waste time, on how not to do it, by a water trust, should at once sanction and encourage the formation of competing companies who are still ready and willing to bring into London a good supply of pure spring water from the chalk hills, at a third of the cost to the consumer.—I am, &c.,

1, Bedford-square, **Jabez Hogg.**
August 23, 1880.

EMPLOYERS' LIABILITY BILL, 1880.

Sir,—I shall be obliged if you can find space for a notice in your journal to the effect that the master-builders of Great Britain have petitioned the House of Lords, praying that their Lordships will make such alterations in the Bill as will bring it into accord with the inclosed objections.—Your obedient servant,

E. S. Henshaw, Secretary.

The Central Association of Master Builders of London, 27, King-street, Covent-garden, W.C., 23rd August, 1880.

1. That the Master Builders of the United Kingdom employ a larger number of hands than are employed in any other branch of industry, proposed to be affected by the present Bill.

2. That, while many other clauses of the Bill are open to objection, Sub-clause 3 of Clause 1 is the most objectionable, as the one which entails the greatest hardship upon employers, and especially those engaged in the building trade.

3. That it appeared from the observations of H. M. Government, that the object and scope of the Bill was only to render the employer liable for the acts of a person "to whom the employer distinctly delegates his own authority," and the definition introduced into the Bill, of a "person who has superintendence entrusted to him," is "a person whose sole or principal duty is that of superintendence, and who is not ordinarily engaged in manual labour."

4. That Sub-clause 3 is in direct contradiction to such definition, and thereby (so far at least as builders are concerned), almost abolishes the defence of common employment nearly every one employed being under the direction of some other.

For the above reasons it is humbly submitted that it will be just and expedient that Sub-clause 3 should be omitted from the Bill, which would then leave every employer liable for the acts of his authorised superintendents.

5. That in regard to Sub-section 4 in Clause 2, it is submitted that it would be impossible, in most cases, to prove that the workman *knew* of the defect or negligence which caused his injury, and it is therefore desirable to alter the Clause as follows, by inserting the words hereinafter put in italics :—

In any case where the workman knew, *or with ordinary care would have known*, of the defect or negligence which caused his injury, *or was aware of any improper conduct on the part of others in the same employ which tended to cause his injury*, and failed within a reasonable time to give, or cause to be given, information thereof to the employer or some person superior to himself in the service of the employer, unless he was aware that the employer or such superior already knew of the said defect or negligence.

Benjamin Hannen,
President of the Builders' Society.
Geo. F. Trollope,
President of the Central Association of London Builders.
Stanley G. Bird,
Vice-President of the National Association of Master Builders of Great Britain.
London, 20th August, 1880.

HEATING AND VENTILATING OF TURKISH BATHS.

Sir,—A short time ago, the *Lancet* frightened many of those who are in the habit of taking the Turkish bath by the following quotation :—

"One of the most obvious sanitary conditions of the bath, but, unfortunately, that which is most difficult to secure, is the purity of the atmosphere in which the breathing organs of persons in a peculiarly susceptible or physiological state are immersed. The breather of impure gases under ordinary circumstances takes his poison largely diluted. If the air of a Turkish bath is laden with germs of disease thrown off from the lungs of a fever or of a consumptive patient, there are no currents to carry the particles away. It is a physical certainty that others breathing in the bath must inhale them. This is an evident source of peril, and suggests the wisdom of taking measures to ensure the frequent changing of an atmosphere which may be thus easily polluted." The following facts, from a paper read April 30th, 1879, at the Philosophical Society, Glasgow, by Mr. J. L. Bruce, architect, on the Heating and Ventilation of Turkish Baths, at the Arlington Club Baths, Glasgow, which are heated by Constantine's Patent Convoluted Stove, show that there is no cause for alarm about the ventilation of the hot rooms of the Turkish baths.

Mr. Bruce states that "the amount of air was exactly measured at the points where it enters the heating apparatus [chamber] in the basement flat. The temperature of the entering air was 52°, the amount for first stove being 790 cubic feet per minute, heated by stove to 312°; and for second stove, 558 cubic feet, heated to 260°—in all, 1,348 cubic feet, entering at 52°. The actual amount of heat-expanded air entering the hottest room is readily obtained from these data by a well-known formula, which gives for stove No. 1, 1,192 cubic feet; and for No. 2, 788·7 cubic feet—in all 1,980·7 cubic feet per minute.

"Giving even double the usual *sleeping*-room allowance of 20 cubic feet per head per minute, that is allowing 40 cubic feet per head—this is sufficient for 50 people in those rooms, and seems enough for all practical purposes. With this enormous volume the temperature maintained in the hot room is about 144°, and in the hottest 210°, the latter being readily raised to 230°, by closing lower part of central arch between the two rooms."

Most of the Turkish baths in this country are heated by the convoluted stove, with ventilation equal to that of the Arlington Baths. The public will be pleased to learn that the ventilation is everything that could be desired.—I am, &c., **Joseph Constantine.**
23, Oxford-street, Manchester.

NORMAN ARCHITECTURE IN SCOTLAND.

Sir,—In your "Commonplace Column," Aug. 20th, under heading "Norman Architecture," for examples in Scotland you refer to Dunkeld as a specimen. This is quite a mistake; there is no

Norman work there. The nave-arches are round, not pointed, and guide-books, and people who know nothing about the history of architecture in Scotland, constantly assert that they are Norman, and this may have misled the writer of the article.

St. Giles' Cathedral is in Edinburgh, not Glasgow, as stated at page 227. T. R.

Intercommunication.

QUESTIONS.

[6204.]—**Cathedrals.**—I shall be glad if some reader of the Building News will kindly give me a list of the cathedrals in England and Wales restored by the late Sir G. Gilbert Scott.—Fred. J. Freeman.

[6205.]—**House Agents' Commission.**—Will any of your readers kindly inform me the usual commission for house agents both in letting and selling houses, and in collecting rents both quarterly and weekly, and when the weekly rents are of several tenements in one house? Any information on this subject will greatly oblige—One in a Fix.

[6206.]—**Copper Candlestick.**—I have lately purchased two copper candlesticks, which have been plated with silver, now partly worn off. Will some correspondent kindly tell me by what means the remaining silver-plating may be removed, without injury to the copper? —P. P.

[6207.]—**Ancient Lights.**—I should deem it an especial favour if any reader could inform me in your next number whether there has been any alteration or amendment of the Act of Parliament as to "Ancient Lights." I have just heard that the period has been altered from 20 years to 12½ years, the latter now giving a right equal to that formerly of 20 years. As I am now building some premises, this is a question which I should very much like answered as fully as possible.—Chips.

[6208.]—**The Gothic Development.**—It is, I suppose, easy at this period of time to trace the causes and influences which have brought in the "Queen Anne" style quite recently, and, perhaps, also the Gothic revival of 40 or 50 years ago. Is there a good architectural history which will tell me if the reasons are now known for the changes in the styles of Gothic architecture? Now, in looking for instance at the east end of Tewkesbury Abbey church, where the arches of the surrounding ambulatory are of lower pitch than the choir arches against which they are built, thus presenting to view from the interior of the choir a bit of Gothic eccentricity, can it be known at this interval of time why the later builders did not build their new arches in keeping with the old? There must be some explanation of this and similar apparent freaks. Also, are there any moderately cheap measured drawings of Worcester Cathedral (Norman work), Tewkesbury Abbey, Malvern Priory Church, and the two old churches at Evesham?—W. G.

[6209.]—**Settling Tanks.**—What is the usual method of constructing small settling tanks for the reception of the drainage of inland villages and small towns before allowing it (slops and some sewage) to discharge into streams? What books give the best practical information and instructions on the most approved manner of draining such places, and disposing of the sewage?—Coventry.

[6210.]—**Emigration.**—Can any reader give me some information about emigration from a young architect's point of view? I am thinking of trying Port Natal, but do not know if it would be suitable or not. Any information on the subject will oblige—Quid.

[6211.]—**Tramp in Suffolk.**—Can any reader afford hints for a tramp on the borders of Suffolk and Norfolk? —Quid.

REPLIES.

[6202.]—**Master v. Pupil.**—Certainly; only in case of bankruptcy of master does it operate as a discharge of indentures of the apprentice. It is of little practical use for a pupil to continue in an office which is doing no work though the master may be able to instruct his pupil privately or find him some other office in which he can remain till the term has expired. The latter is the best plan for employer to adopt. No honourable master would like to allow his failure in business to exonerate him from the duty he has engaged to fulfil.—G. H. G.

[6203.]—**Tank.**—The plan I should advise "C. S." to adopt is to carefully examine the tank and fill in all the cracks with Portland cement. After this I should line the tank in the following manner:—Line the bottom with a layer of concrete made of 3 of sand to 1 of Portland cement. The side walls may be of concrete, and the whole afterwards rendered with cement, or, better still, with asphalte. If the cracks are not very large, I should say a ¾in. lining of good asphalte would answer purpose. Slate slabs tongued and grooved and set in oil cement I have used for similar purposes, and when well done they are effective.—G. H. G.

STAINED GLASS.

Westerdale.—The parish-church of Westerdale, co. York, has just been enriched with a 3-light stained-glass east window. The donor is the rector, the Rev. J. Rathhone Ellis, and his gift is in memory of his deceased wife and daughter. The subject, spreading over the three lights, is the Crucifixion according to St. John. On either side of the uplifted Saviour is an adoring witness-angel. At the foot of the Cross Mary Magdalen exhibits the intensity of her grief, whilst to her right and left are grouped Mary-Mother and the other Mary, St. John, and the Centurion. Messrs. Powell, Bros., Park-square, Leeds, are the artists.

WATER SUPPLY AND SANITARY MATTERS.

Sanitary Work in Kensington.—The annual report on the health and sanitary condition of the parish of St. Mary Ahbott's, Kensington, for the year 1879 has just been published by Dr. T. Orme Dudfield, medical officer of health. The death-rate for the exceptional year of 53 weeks was 19·1 per 1,000, 0·1 per 1,000 below the decennial average. Statistics are given showing the rapid development of the parish during the past few years. More than 700 fresh houses were brought into rating in 1879, and building operations are still in progress which threaten in a few years to absorb all available land. In the report the possibility of contagion being distributed from the Small-Pox Hospital near Brompton Cemetery is considered at length. The author concedes that such an institution is liable to become a danger to the vicinity unless properly managed, but he considers that the precautions taken at this hospital by disinfection, destruction of broken food and sweepings, plentiful air-space and quarantine precautions, have been effectual in preventing the spread of disease, while no house is nearer than 750ft., whereas the contagion of small-pox has not been known to travel 100ft. It is reported that the abatement of nuisances has been much accelerated by the plan of serving "preliminary notices" upon the parties liable immediately on discovery. Amongst the offences against the sanitary Acts, for which proceedings were successfully instituted, were cases of allowing offensive accumulation of manure, of allowing gipsies to encamp, there being no accommodation on the ground, of not carrying out sanitary works ordered by vestry, of omitting to give notice to vestry before beginning to make drains, or neglecting to construct drains when ordered, and of burning ballast so as to be a nuisance to the neighbourhood. As to collection of dust and ashes, the vestry has found the result of taking the duty into their own hands increasingly satisfactory; complaints are now rare, and even applications for removal of dust are comparatively few. The parish has been divided into districts to facilitate inspection of bins and supervision of dusting gangs. Sanitary authorities have had great cause of complaint on the score of the defective foundations and unhealthy sites of buildings; for not only have some unworthy builders been known to use bricks saturated with filth from broken-up sewers, in the foundations of houses, and to neglect precautions against the rising of damp, but it has been a too-common practice to excavate the natural soil and to fill up holes so made with slop and the contents of dust-bins. Happily, these practices can no longer be adopted with impunity, as new by-laws have been made by the Metropolitan Board of Works.

CHIPS.

An inquiry was held at Warwick, on Thursday week, before Mr. J. T. Harrisou, C.E., one of the Local Government Board's inspectors, with reference to an application from the town council for sanction to a loan for £2,500, required for the sewage-farm, the management of which has recently reverted to the town-council. No opposition was raised to the proposal.

Plans have been prepared by Mr. G. T. Redmayne, architect, of Manchester, for the erection in Victoria Park, Rusholme, of a building for the use of the students of the Victoria University connected with the Society of Friends.

New offices for the gas company have just been completed at Wolverhampton, at a cost of £6,800. The main front of the building faces Waterloo-road, and extends a total length of 150ft. The contractor for the erection of the building was Mr. Henry Clarke, of Wolverhampton, the subcontractor for the masonry being Mr. John Jarrett. The architect is Mr. J. R. Veal.

The annual excursion of the Suffolk Institute of Archæology was held on Thursday week. Wattisfield Hall, an Elizabethan hall, which has just undergone extensive alterations to suit the purposes of a new tenant, was first visited, and then the adjacent parish-church, a Perpendicular structure restored last year. The churches of Rickinghall, Superior and Inferior, were next seen, papers being read in each prepared by Mr. Turner, the churchwarden, who was formerly an architect; the latter church is the more interesting, having a Norman round tower and much Late 13th-century work. The 14th-century chantry chapel at Botesdale, and the fine example of a Late Decorated church at Redgrave, concluded the day's visits.

At a meeting of the corporation of Looe, several tenders were received for the proposed town clock, and that of Mr. John Smith, of Derhy, was accepted at about £200. The clock will have four illuminated dials, and will strike the Cambridge chimes each quarter-hour.

Our Office Table.

A remarkable instance of growth in value of business premises in the City of London is afforded by some proceedings which terminated last week. In pursuance of their plans for improving the City, the Corporation desired to appropriate the premises of tradesmen in Gracechurch-street, whose net annual profits were only about £1,000. In his claim for compensation the owner put the rental value of the place at £600 a year, while the Corporation assessed it at £450, or 10 per cent. a foot rental at 20 years' purchase and cost of building. Twenty-three years ago the owner bought the premises for £1,800, their proportions being a frontage of 14ft., with a depth of 44ft., and a superficial area of about 640ft. The dispute was referred to the Recorder of London and a special jury, and in the end a verdict was given for £16,500, the jury assessing the rental value at £550 a year, and £12,100 for the freehold, this representing 18 guineas a foot, as against £2 15s. a foot, which the owner paid in 1857, and three and a half years' purchase of the profits.

On Wednesday week the members and associates of the Society of Engineers visited the works of the London and South Western Railway Company at Nine Elms. The company visited the drawing offices, the carriage-trimming department, the carriage-painting, boiler, machine, fitting, tyre, wood, and moulding shops, observing with much interest the operations conducted therein. In the fitting-shop Church's patent slide-valve was inspected, and in the tyre-shop some improved methods were pointed out. The stationary boilers have now been brought together, and by a pneumatic arrangement the sawdust from the saw mill is conducted to them and used for fuel. In the wood-shop is a large circular saw made without hammering, the speciality of the Lane Manufacturing Company, of America. This implement sawed through a log 15ft. long and 15in. thick in ten seconds. In the same department several machines by Ransome and Company, of Chelsea, for planing, sawing, slotting, &c., were exhibited.

A new system of water purification has recently been introduced at the Royal Aquarium, Westminster. The fresh water, as supplied from the waterworks, is delivered into a large tank capable of holding about 80,000 gallons. For the past fortnight this supply of fresh water has been treated by the purifying and softening system devised by Messrs. F. H. Atkins and Co., of Fleet-street, and with a marked improvement in the results both as regards the clearness of the water and the reduction of mortality among the fishes, as testified by Mr. Carrington, the naturalist at the Aquarium. The apparatus consists of a cylinder containing lime, a softening cistern, and a filter. The impure water is delivered in bulk into the softening cistern, a small proportion of it being passed on its way there through the lime cylinder. The jet of lime water, mixing in due proportion with the body of water in the cistern, not only purifies and softens it, but coagulates the clay held in suspension, and thus insures its complete removal by the filter into which it next passes. This latter part of the apparatus consists of a series of hollow discs 2ft. in diameter and three quarters of an inch thick, covered with filter cloth, and is so constructed as to offer a large amount of filtering surface within a very limited area. The water passes through the discs to the tank, where its clearness and brightness now present a marked contrast to the turbidity of the former supply. It is stated that this filter will pass from 80 to 100 gallons of pure water per square foot of surface per hour.

The Government having granted the use of the old Parliament Hall, Law Courts, and Assembly Hall at Edinburgh, for the meetings of the Social Science Congress, to be held in October next, the Local Committee have been able to complete arrangements. The Parliament Hall will be fitted up as the reception room. The Law Department, divided into the sections of International and Municipal Law, is to be accommodated in the First Division Court-Room. The Repression of Crime Section will find a meeting place in the Justiciary Court-Room. The "Health" Department will sit in the

Second Division Court-Room; the "Economy and Trade" Department will be congenially located to the hall of the Chamber of Commerce, George IV. Bridge; while the Art Department will conduct its discussions in the Established Assembly Hall. The Education Department is yet unprovided for; but it is confidently expected that either in the old County Buildings or in some other equally suitable place the needful accommodation will be obtained. Then for the inaugural address, which will be delivered by Lord Reay, as also for the addresses by the presidents of departments, the Free Assembly Hall will be available; and the upper hall of the Signet Library has been placed at the disposal of the committee for the meetings of the General Council.

A competition in slate-splitting and dressing came off during the interval between the morning meeting and the evening concert of the Welsh Eisteddfod at Carnarvon, on Tuesday. So numerous were the competitors, and so great was the interest evinced in this, a novel feature at an eisteddfod, that a delay of upwards of half an hour was caused in the commencement of the concert. The judges were Messrs. J. J. Evans, manager of the Penrhyn slate quarries; R. Owen, Rhiwbrydfir; R. R. Williams, the latter of whom initiated the competition, and guaranteed the prizes. The competition resulted as follows — Class 1 (open to all comers) :— 1, £5 5s. Griffith Jones, Welsh Slate Company, Festiniog; 2.—£3 3s., William Lewis, Penygroes; 3, £1 1s., W. H. Williams, Rachub. Class 2 (for boys under 16 year); 1, £4 4s., O. Williams, Groeslon; 2 and 3, £3 3s., divided between W. O. Owen, Welsh Slate Company, and T. R. Owen, Rhostryfan. Class 3, special competition open to all comers. To the two men who will best cut, split, and dress a rough block from any quarry, the block not to exceed 3ft 6in. in length, any width, and 2½in. thick. First prize of £10 10s. divided between R. Jones, and J. Hughes, Bethesda; J. R. Jones and R. W. Rowlands, Llanberis; 3, R. W. Thomas, Llandwrog, and H. O. Parry, Penygroes.

CHIPS.

Captain Cole, of the Royal Engineers, has been appointed by the Indian Government to the new office of Conservator of Ancient Monuments and Antiquities in India. Captain Cole is favourably known for his investigations into the early architecture of Cashmere.

The parish-church of Darmsden, near Stowmarket, was reopened on the 15th inst., after restoration, from the designs of Mr. Herbert J. Green, of Norwich. The seats, and other fittings are all new. The work has been carried out by a North Walsham firm.

A new coffee-tavern, the Prince's Arms, has been opened in Prince's-street, Ipswich. It has been fitted up in the Queen Anne style by Messrs. Meadows and Bennett, from the designs of Mr. Brightwen Binyon, of Ipswich.

The parish-church of Gressenhall, Norfolk, was reopened on Sunday, after restoration, including the rebuilding of the tower. The contractor was Mr. E. Brown, of King's Lynn.

On Tuesday week a new Board-school was opened at Bolton, three miles from Mexborough. The school has been built at a cost of £2,000, the architects being Messrs. Wade and Turner, of Barnsley. The school is built of rock-faced stone from the Mexborough quarries.

The parish-church of St. Petrock, Bodmin, the largest church in Cornwall, was reopened on Sunday week, after complete restoration of the nave, and reseating with chairs.

The foundation-stone of a new church of St. John, at Bognor, Sussex, was laid on Wednesday. The new building, when completed, will be 128ft. long by 65ft. across transepts; the chancel will be 52ft. high, and the nave 58ft. high. It will be built of flint, with brick courses at 6ft. intervals, and red brick quoins; the dressings will be of red brick and Corsham Down stone, and the roof will be tiled. A tower and spire will rise 150ft. high. The church is to seat 854 persons, and will cost about £8,000; but as only about £3,000 is in hand, it is only proposed at present to erect chancel and one transept. Mr. A. W. Blomfield, M.A., of London, is the architect, and Messrs. Dove Brothers, of London, are the contractors.

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Budleigh Salterton.—For carrying out the water works, for the Local Board. Mr. C. W. Whitaker, C.E. Gt. George-street, Westminster, engineer ;—

	£	s.	d.
Willey and Co., Exeter	£5,867	15	0
Kerslake, Exeter	5,550	6	8
Facey, R. N., Manchester... ...	5,500	0	0
Painter, A. F., Berkhampstead ...	5,193	0	0
Gould, J., Newport...	4,916	0	0
Bell, J , London	4,795	0	0
Stephens and Bastow, London ...	4,759	0	0
Hawkins and Best, Teignmouth...	4,582	9	1
Chaddock, W., Saltash	4,567	0	0
Coleridge, R.	4,477	0	0
Phillipps, H., Exeter	4,394	0	0
Crokand, Starcross	4,110	0	0
Small, T., Gloucester	4,000	0	0
Gibson, W., Exeter (accepted) ...	3,620	0	0

Crouch End.—For the erection of two detached villa residences, Middle-lane, Crouch End, N., for L. Keller, Esq. Mr. John Farrer, architect and surveyor, Albion Chambers, 20, Finsbury Pavement, E.C. :—

	£	s.	d.
Grover, J.	£4,573	0	0
Macfarlane and Son	4,405	0	0
Smith, J.	4,396	0	0
Laurence, W...	4,379	0	0
Conder, R.	4,270	0	0
Mattock, Bros.	4,233	0	0
King, J. T.	4,198	0	0
Harper, J.	3,708	0	0

Crystal Palace.—For additions to the Palace Brewery, Anerley-road, for Messrs. Edie Bros. Mr. C. J. C. Pawley, architect, No. 26, Moorgate-street, and Sydenham, S.E. :—

	£	s.	d.
Flynn and Son, Anerley	£350	0	0
Smith, J. and Sons, South Norwood	260	0	0
Fox, W., Anerley	250	10	0
Hollidge & Stuart, South Norwood*	233	0	0

* Accepted.

Dulwich.—For villa residence No. 2, for Jas. Henderson, Esq. Mr. Richard Peters, architect, Wool Exchange, Coleman-street, E.C. No quantities :—

	£	s.	d.
Parrish...	£1,670	0	0
Watson and Dennett (accepted)...	1,450	0	0

Halesworth.—For Patrick Stead Hospital, Halesworth, East Suffolk. Mr. Henry Hall, architect. Quantities supplied by Mr. S. J. Thacker :—

	Hospital.	Fittings.	Mortuary.	Lodge.	Total.
Watson ...					£5,630 0 0
Garrud ...	£4,683 0 0	£315 0 0	£168 0 0	£317 0 0	5,483 0 0
Garlick ...	4,600 0 0	321 0 0	148 0 0	299 0 0	5,377 0 0
Smith, H. B...	4,433 0 0	313 0 0	163 0 0	273 0 0	5,182 0 0
Girling ...	4,450 0 0	295 0 0	140 0 0	290 0 0	5,175 0 0
Whiting ...	4,395 0 0	287 0 0	151 0 0	318 0 0	5,151 0 0
Harper ...	4,250 0 0	330 0 0	150 0 0	300 0 0	5,030 0 0
Hindes ...	4,296 0 0	270 0 0	126 0 0	281 0 0	4,974 0 0
Saunders and Son ...	4,140 0 0	298 0 0	140 0 0	282 0 0	4,860 0 0
Everett ...	4,138 0 0	280 0 0	145 0 0	285 0 0	4,840 0 0
Holsworth and Son	4,070 0 0	295 0 0	150 0 0	285 0 0	4,800 0 0
Grimwood ...	4,132 0 0	270 0 0	120 0 0	265 0 0	4,787 0 0
Mason and Son ...	4,083 0 0	296 0 0	106 0 0	295 0 0	4,780 0 0
Jones and Co. ...	4,050 0 0	311 0 0	137 0 0	281 0 0	4,779 0 0
Calver, Bros. ...	4,110 0 0	291 0 0	134 0 0	234 0 0	4,767 0 0
Smith, R. S....	4,000 0 0	340 0 0	100 0 0	260 0 0	4,700 0 0
Ludkin and Son ...	3,875 0 0	285 0 0	150 0 0	285 0 0	4,595 0 0
Pells and Son ...	3,919 0 0	297 0 0	117 0 0	259 0 0	4,592 0 0
Gibbs and Son ...	3,824 0 0	292 0 0	130 0 0	286 0 0	4,532 0 0
Gibbons ...	3,850 0 0	300 0 0	105 0 0	275 0 0	4,530 0 0
Morris ...	3,804 0 0	281 0 0	122 0 0	273 0 0	4,480 0 0
Howard and Son ...	3,744 0 0	301 0 0	123 0 0	262 0 0	4,430 0 0

Lewisham.—For the construction of a sewer in Ennersdale-road, Blackheath, for the Lewisham District Board of Works :—

	£	s.	d.
Woodham, H., Rushey Green (accepted)	£3,268	0	0

[At a previous meeting of the Board, the tender of W. Carter, which was £800 less than the surveyor's estimate, was accepted, but it was subsequently withdrawn on account of error.]

London.—For six warehouses, Jewin-street and Edmund's-place, E.C. Messrs. Ford and Hesketh, architects, 21, Aldermanbury, E.C. :—

	£	s.	d.
Adamson and Sons...	£17,593	0	0
Scrivener and Co.	17,143	0	0
Brass	16,997	0	0
Hart	16,645	0	0
Peto, Bros.	16,500	0	0
Mark	15,382	0	0
Crabb	16,270	0	0
Lawrance, E...	15,565	0	0
Conder, R.	15,289	0	0
Ashby, Bros. (accepted)	15,256	0	0

London.—For rebuilding the "Ship," Wormwood-street, City. Messrs. Bird and Walters, architects. Quantities supplied :—

	£	s.	d.
Bridgeman	£2,338	0	0
Williams and Son	2,166	0	0
Temple and Foster	2,166	0	0
Mark	2,160	0	0
Godden	2,145	0	0
Braid and Co...	2,105	0	0
Anley	1,967	0	0
Anley, P.	1,840	0	0
Jackson and Todd	1,808	0	0

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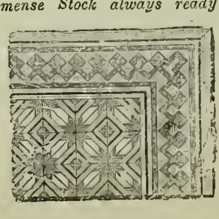

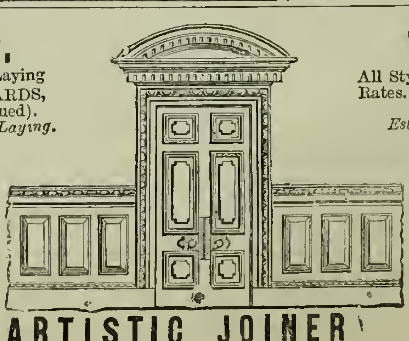

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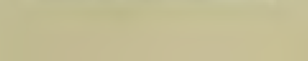

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 3, 1880.

THE LATE MR. BENJAMIN FERREY AND HIS WORKS.

MR. BENJAMIN FERREY, whose death took place on the 22nd ultimo, from an affection of the heart and other complications, at his residence, Inverness-terrace, Bayswater, was well known as one of the leading Gothic architects of the school of which Pugin may be said to have been the founder. For nearly three years past his name had, in a great measure, ceased to be heard of in connection with the active duties of his profession, which has been carried on lately by his only son, Mr. Edmund B. Ferrey, of Spring-gardens, the successor to his practice. Mr. Benjamin Ferrey, born in 1810, was a pupil of the elder Pugin, and became early imbued with the spirit of the style of his master, which was late 14th-century, wherein he seems to have obtained an early proficiency, if we may judge by the drawings of ecclesiastical buildings which he has left in several architectural works. In this direction one of his earliest efforts was a description of the Priory of Christchurch, Hants, his birthplace, and a town with which he appears to have been early associated. The work was published in 1834, as a quarto, and contained plans, elevations, and sections of the priory, and an account of the church by E. W. Brayley. Mr. Ferrey restored the church in 1860, previous to which the nave and roof had undergone repair and partial reconstruction under the supervision of the late Mr. Edward Garbett, architect, of Winchester. The engraved drawings of Mr. Ferrey show careful measurements, and the detail of the fine Norman nave of Bishop Flambard down to the Perpendicular portions, including the 15th-century tower, supplied ample materials for a practical acquaintance with the various phases of Gothic work. No doubt it was this work which helped to form young Ferrey's taste. After this his connection soon increased, and the period of church restoration and repair, which had just then commenced, opened a field for his energies, as it did those of other architects of the Gothic school. We have only space here to notice a few of the chief works of Mr. Benjamin Ferrey. One of his most important works was St. Stephen's Church and Schools, Rochester-row, Westminster, a group of buildings in a Late Decorated style. The massive tower, with its slender spire and large pinnacles at the base, is still a conspicuous object, though the proportions externally are not those we should now call good. The windows to the clerestory strike us by their smallness, though the interior favourably compares with many others built in this ornate style, and the detail throughout is pure. We cite this work as a typical example of Mr. Ferrey's style, which was characterised more by elegance than vigour. Other works are the Worcester Diocesan Training College, Saltley; Dorchester Town-hall; the Dorset County Hospital; restoration of the nave and transepts and Lady-chapel of Wells Cathedral; also, subsequently, the west façade of Romsey Abbey church; Killaleagh Castle; almshouses at Shepton Mallet, mansions at Bulstrode, Wynnstay, &c., besides numerous churches, schools, and parsonage-houses. Between the years 1842 and 1850 Mr. B. Ferrey was engaged upon the restoration of the fine church of St. Mary Magdalene, at Taunton. In this work Mr. Ferrey was associated with the county surveyor, Mr. Carver. The grand Perpendicular tower, famed throughout England, was soon discovered to be in a tottering state; the ringing of the splendid peal of bells had in the course of time so impaired the stability of the masonry, that they had to be removed. A partial repair, by replacing the angle buttresses, which were found to be without bond to the walls, was abandoned as useless, and Mr. Giles, the architect, called in the services of the late Sir Gilbert Scott, who reported that the tower would have to be taken completely down and rebuilt. In this work Scott was associated with Mr. Ferrey, who jointly prepared the plans and specification. Of course there was no original design required in this work, as the old tower had to be copied faithfully. Mr. Ferrey had previously studied the towers of this locality, and in a paper, "The Towers of Somerset," had set forth the disastrous effect upon towers of the practice of wedging tightly the framework of the bells to the walls, which has destroyed some of the finest of our old towers. Apropos of the subject, we may quote a passage from Mr. Ferrey's observations: "When the ringers encounter a difficulty in ringing owing to the weakness of the framing, instead of bracing the parts together, so as to make the framework itself secure, they stiffen it by thrusting struts and wedges between the main timbers and the walls. . . . The disastrous effect of the system must be manifest. Upon observing old bell-framing, it will be found perfectly independent of the side walls, and when the peal is in full action, the whole cagework may be seen to oscillate considerably, having no contact with the walls; being, indeed, no more than a dead and inert weight resting upon stone corbels or set-offs."

Among the works in St. Mary's, Taunton, was a new pulpit from Mr. Ferrey's design, a rather florid example of Decorated, in which niches were introduced for figures. After the pulpit was finished, the figures were objected to by some members of the congregation, whose bigotry overruled their judgment, and they were removed. Mr. Ferrey was naturally displeased with such a proceeding, and a correspondence took place on the subject, but we do not know the result. Another work of his was the church at Buckland St. Mary, and also a reredos in St. Cuthbert's Church, Wells.

Mr. Ferrey's designs are thoroughly English in conception and feeling, and characterised by rather a florid tendency, as in the pulpit and reredos above mentioned. He was rather a close adherent of precedent, than a bold originator. The literary labours of Mr. Ferrey, if not great, are distinguished for the practical tone that pervades them. He contributed various papers, of which several are fo be found among the Sessional Papers of the Institute. These include "Observations on Gothic Vaulting," 1840; "A Letter, relative to Process described by J. Sylvester, to render Bricks and Stone impervious to Moisture," 1843; "Account of curious double spiral staircase in the church of St. Editha, Tamworth," 1843; "Notes on the Life of C. Miles," 1849; "Notes on Stamped or Incised Stucco," 1857; "Remarks upon Works of Early Mediæval Architects: Gundolph Flambard, William of Sens," &c., 1864; "Observations on the West Front of Wells Cathedral," 1870. In the first of these papers Mr. Ferrey referred chiefly to waggon-headed vaults, and more especially to those examples in which the structure of the stone arch forms both the internal and external roof. He instances Abbotsbury chapel as a remarkable specimen of roofs of this class, the vault of which is constructed with more than common solidity and skill, and has withstood the elements, although exposed on the cliffs of Dorsetshire and long left to neglect. In 1843 we find among the sessional papers of the Institute a letter by him relating to Mr. Sylvester's (then new) process of rendering bricks and stone impervious to moisture. Mr. Sylvester's suggestion many of our readers may have forgotten; we may remind them it consisted in the application of a solution of soap and alum to walls. The soap was applied mixed with water in a boiling state, followed, after quite dry, by the solution of alum. Mr. B. Ferrey confirmed the efficiency of this process in close-grained brick and stone, and he suggested its use for the stonework of the Houses of Parliament. The rapid decay of the stone used since this time, of course, has rendered such a suggestion highly improbable as to its results.

Mr. Benjamin Ferrey, in 1857, read a short paper before the Institute of British Architects, in which he recommended a method of stamping or incising stucco surfaces while wet. It is really the revival of an old method, but we may quote a part of the paper to show that tho method was then comparatively little known:—"A very cheap and simple mode of ornamentation seems hitherto to have remained unattempted. It is well known that the external rough-casting on old timber houses was stamped or wrought in small devices, known by the term 'pargetting'; but it never assumed the importance of extensive wall decorations, as when stone and brick entirely superseded the use of quartered oak framing the system of pargetting also ceased. The plan now proposed is to impress the common stucco with geometrical and other forms, and applied according to taste, either under string-courses, around arches, in sprandrels, soffits, or in large masses of diapering; and texts may be imprinted on the plaster instead of being simply painted on the walls. If colour be desired, it can be effected by mixing the desired colour with the coat forming the groundwork, then, by laying the stencilled pattern against it, and filling in the solid portions of the device with the ordinary stucco or plaster." Whippingham Church, Isle of Wight, has been decorated with differed coloured devices on this plan, and Mr. Ferrey recommended it especially as a suitable kind of ornamentation for the interiors of churches. The patterns may be impressed *in situ* upon the plaster. It is needless to say that this mode of decoration has lately been revived, though not exactly in the way above sketched out. The advantage of plaster or stucco ornamentation is that it affords a cheap method, and can be applied when the use of bricks, terra-cotta, tiles, or mosaic are out of the question.

In connection with architectural or artistic criticism, Mr. Ferrey can scarcely be said to have taken a leading part, though his "Observations on the West Front of Wells Cathedral," made in 1870, show good judgment. He then referred to the unequalled beauty of this front, its ranks of sculptured figures, monarchs, saints, and prelates, and he endorses the opinion of Professor Cockerell on the excellent selection of subjects, the absence of all apocryphal and superstitious ideas, and the beautiful and ordered gradation, beginning with the Creation in the lower part, and finishing in the pediment with figures representing the Last Judgment. He then pointed out also the decay of many of the abaci of the pillars, which are of blue lias or imperfectly-formed marble, probably due to the stone not having been placed on the natural bed. But of all his literary efforts he will be best known by his "Recollections of A. N. Welby Pugin and his Father," a work dedicated to A. J. Beresford Hope, and in which the author has brought together many of the marks of genius and characteristics of the great Mediæval revivalist, though of his worth as a Roman Catholic he allows another to speak. The work is chiefly a collection of correspondence, and was well received, though scarcely equal to the merit of Pugin as a great revivalist. Mr. Ferrey also contributed papers to the *Archæological Journal*, the *Church Builder*, *Gentleman's Magazine*, &c. He was honorary architect to the diocese of Bath and Wells, a fellow of the Society of Antiquaries, member of the Graphic Society, and was a past vice-president of the R.I.B.A. In 1870, Mr. Ferrey was presented with the gold medal. In his later years Mr. Ferrey's son, Edmund Benjamin, was associated with his father in most of his works. Mr. Ferrey was in his seventy-first year, and his funeral took place last Friday. We append a list of some of his principal works:—

New Mansions.—Bagshot Park (Duke of Connaught), Surrey; Bulstrode, Bucks (Duke of Somerset); Wynnstay, North Wales (Sir Watkin W. Wynn, Bart., M.P.), Huntsham Court, Devon (C. A. W. Troyte, Esq.).

Additions and Alterations to Mansions.—North Aston, Oxon (W. H. Foster-Melliar, Esq.); Brogyntyn, Salop (Lord Harlech); Killaleagh Castle, Ireland (Earl of Dufferin); Baynard's Park, Horsham (Rev. Thomas Thurlow); Bridehead, Dorchester (R. Williams, Esq.); Frampton Court, Dorchester (R. B. Sheridan, Esq.); Bishop's Palace, Wells; Poltimore Park, Devon (Lord Poltimore).

Public Buildings, &c.—Dorset County Hospital, Dorchester; Town Hall, Dorchester; Saltley Training Schools, near Birmingham; Dining Rooms, Booking Offices, &c., Ascot Grand Stand; First Laying out of Bournemouth for the late Sir George Gervis; Royal Cambridge Asylum, Kingston-on-Thames (commenced by the late Mr. Allom).

Parsonages.—Eton, Windsor; St. Paul's, Dorking; Elsted, Hants; Fitzhead, Somerset; Huntsham, Devon; Henley-on-Thames; Keresley, Staffordshire; New Shoreham; Nuthurst, Sussex; Pishill, Oxon; Penn-street, Bucks; Romsey, Hants; St. Stephen's, Westminster; Tarrant Hinton, Dorset.

Schools.—Buckland Newton, Dorset; Bala, North Wales; St. John's, Angell Town, Chetwynd, Shropshire; Cuckfield, Sussex; Esher, Surrey; Henley-on-Thames; Llannwellyn, North Wales; Morpeth, Northumberland; Otterton, Devon; Romsey, Hants; St. Mary Magdalene, Taunton; Upper Tooting, Surrey; Sidlesham, Sussex.

New Churches.—St. Stephen's, Rochester-row; Christchurch, Union-grove, Clapham; St. John's, Angell Town; Christchurch, Victoria-road, Kensington; Christchurch, Endell-street; St. Ann's, Brighton; All Saint's, Blackheath; Bengeo, Herts; Birlingham, Worcestershire; Buckland St. Mary, Somerset; Christchurch, South Banbury; Burton, Hants; Chetwynd, Salop; St. Paul's, Dorking; St. John's, Eton; Christchurch, Eastbourne; Lower Slaughter, Gloucestershire; Linslade, Herts; Penn-street, Bucks; Holy Trinity, Roehampton; Sambrook, Salop; Immanuel Ch., Streatham-common.

Church Restorations and Additions.—Wells Cathedral; Wrexham; Brislington, Somerset; Barkway, Herts; St. Lawrence, New Brentford; Chobham, Surrey; Christchurch Priory Church, Hants; Castle Cary, Somerset; Corwen, North Wales; Crich, Derbyshire; Down Ampney, Gloucestershire; Elm, Hants; Huish Episcopi, Somerset; Henley-on-Thames; Llangedwyn, North Wales; Merriott, Somerset; Martock, Somerset; Merton, Surrey; Maulden, Beds; Ruabon, North Wales; Riby, Lincolnshire; Sopley, Hants; Streatham Parish Church; Thames Ditton, Surrey; Up-Ottery, Devon; Wichnor, Staffordshire; Westbourne, Sussex; Wingham, Kent; Ystrydgwlais, South Wales.

WHAT IS MORTAR?

(*Concluded from p.* 232.)

THICK joints, of whatever kind of lime-mortar they may be made, are simply, from our point of view, wasteful, and, what is much worse, useless. The duty of a mortar-joint, as we have already said, is to adhere the surfaces of the brick together, just as two pieces of wood are joined by the aid of glue, or other similar binding agent. In the case of wood-joining, no superfluity of glue is permissible, because the joint would be weakened if more was used than was absolutely necessary for the purpose required. The same rule is especially applicable to mortar-joints, and, if possible, with more necessity for accuracy. Excess of lime, or its careless admixture with sand, renders such a mortar quite incompetent to perform the duty for which it is primarily destined. Lime obtained from chalk and other pure carbonates has no cohesive capacity, and its only useful faculty in construction is its quality of adhesiveness, and, therefore, such limes by themselves cannot, under the most favourable conditions, ever become indurated. They will either become pasty or powdery masses, according to the conditions of their surroundings. Alberti relates that he saw lime in a trench which was, from good presumptive evidence, five hundred years old, and it was then still moist as "honey or marrow." The proof of the dustiness of modern mortar is unhappily too widespread in our day to permit us to doubt of its existence; for whenever an old building is being pulled down, the dust shows that *mortar* existed only in name; even the mortar taken down with Temple Bar was merely pulverulent in character.

Various theories as to the recarbonisation and silicisation of mortar prevailed in past times, leading the confiding builder to hope that, however defective his manipulation and materials were, Nature would assist in ultimately indurating the mortar. This somewhat fallacious view has received a shock at the hands of the modern chemist, who clearly demonstrates that even the mortar used in the Great Pyramid of Cheops has not even yet become perfectly recarbonated, while the mortar of Burgh Castle, Suffolk (a Roman garrison), has been shown not to have received any adventitious aid from its well-proportioned siliceous aggregates. There cannot be, or at least should not be, any comfort sought for by the builder, therefore, in that direction, and he must, if he desires to produce a good mortar, prepare it on the only legitimate lines based on a thorough scientific as well as common-sense examination of the question.

Mortar, of whatever kind, receives good or bad influences through the quality of the bricks or stones with which it is brought in contact, and, therefore, some degree of attention is required to secure the best constructive results. Differences in the porosity of bricks, for instance, have much to do with the beneficial action of the mortar, as has been shown by some experiments with Staffordshire moderately glazed blue bricks, hard grey stocks, and soft place-bricks. The two Staffordshire bricks, jointed with blue lias lime mortar, at the end of one month were separated by a force of 40lb. per square inch, grey stocks by a pull of 36lb. per square inch, while the soft place-bricks were pulled asunder with a force of 18lb. per square inch. In this case the lowest result was reached through the softest material, which, doubtless owing to its excessive porosity, robbed the mortar, while setting, of its water of hydration too speedily. In another series of experiments, the lowest value was found to be from the hardest stone, the results being as follows: —Granite being equal to 11 and Portland stone 16 in relative adhesive value, the cementing agent in that case being Portland cement, so that while providing against the dangers of improper mortar, one of those not to be disregarded is the capacity of absorption in the bricks. Drenching the bricks does not, in fact, secure immunity at at all times from this danger, for during exceptionally warm weather, the evaporation of the water would speedily follow, and the spongy brick would in such a case rob the mortar of its moisture.

What are the precautions required to protect buildings against the dangers common to the preparation of mortar and their use? We need not with any degree of particularity enumerate in an essay of this kind, necessarily so general in its character, the exact details, but we may briefly state that, above all things, it is essential that, of whatever proportions the mortar may be composed, accuracy of mixture may be obtained. Proportion must always be an important factor in this question, because the quality and character of both lime and sand influence the calculations, which must, under intelligent conditions, determine on how much of one and the other should be used. Properly decarbonised lime, and all the details of its manufacture strictly perfect in character, ought to secure a matrix competent to blend with, or become incorporated with, any kind of suitable aggregate. Under any circumstances, the sand should be naturally clean, or, if foul and loamy in character, freed by washing from any impurities which could interfere with its profitable mixture with the lime. Fine sand would require a larger proportion of lime than one coarse in character, because it is a necessary condition of success in mortar-making that every particle of aggregate should be perfectly covered with lime; otherwise, the cementitious result would be defective. Fine granules increase the surfaces, and, therefore, to coat them with advantage, a more diffusive state of the lime is indispensable; otherwise, there would be vacuities, calculated to impair the coherency of the mortar, for the particles of sand, under ordinary conditions, could not be brought into sufficiently accurate contact with each other. Coarse sand is more suitable for mortar-making purposes when there is sufficient fine stuff to fill up the voids resulting from the impossibility of forming a compact mass with such materials, and less time would be required, because there would be, in such a case, more limited surfaces to require coating from the cementing agent. The whole processes, under whatever circumstances, should be mainly directed to secure well balanced proportions, without a superfluity of either matrix or aggregate. The sands vary in texture according to the source from which they are obtained; but, generally speaking, they are composed of spherical particles, more or less hard in texture, according to the geological source from which they were originally derived. Pit-sands are not usually so favourable as those obtained from the river, or other similar sources, because they are usually associated with fine silt or loam, either contemporaneous with their original deposit, or subsequently infiltrated by water action from surface sources.

Modern mortar-joints, according to our argument, are simply wasteful in their character, and, practically, exert no beneficial influence on the brickwork with which they form so conspicuous an adjunct. There is a double duty which should be forthcoming from the mortar-joints, although we fear it is never looked upon except in its single sense, that of keeping the bricks together. The other duty, of protecting the arrises of the bricks from degradation, is a no less important one than the other, for if the mortar-joint dusts out, or is washed out by the action of the weather, the sharp angles of the bricks become rounded, and the first act of decay sets it. The Romans, famous for their attention to, and sensible knowledge of, mortar, erected buildings in many countries which still endure when the buildings of the Middle Ages have crumbled away. Those who take the trouble to examine some of the old feudal strongholds of our own land cannot fail to see that their decay is due to the weather action of the mortar joints, except where the concrete form of wall was adopted, and, under such circumstances, a much more durable example is apparent.

Some of our architects and engineers, without giving the question of mortar the necessary intelligent consideration, commit the equally-reprehensible practice of using too much lime in their mortar. The results of this are apparent in the unsightly discolouration of the fronts of buildings in the architectural direction, and in that of the engineering division of construction, in the numerous stalactites under the soffits of the arches of railway and other bridges. The exudence of lime in these cases is due to its having been used in excess in the mortar and the action of water washes it out of the so-called mortar mass. There could have been no substantial coherence of the mortar under such circumstances, for the presence of *unmixed* lime was calculated to degrade, and, in the end, probably leave the sand in a state of impoverishment, at least so far as the cementing agent was concerned.

The mortar question is essentially within the control of the constructor, and we hope that these remarks will lead up to a better appreciation of a subject which has, during recent times, had but scant attention. The modern tendency to improved brickwork will doubtless result in an eventual improvement in mortar-joints, for accurately-laid bricks, of the bright red colour of to-day, must have clearly-defined joints of minimum thickness, and the pleasing surfaces must not be disfigured by the exuding lime from badly-proportioned mortars.

In large works the mortar-mill takes a more prominent place than its merits deserve, and we fear that much of the bad mortar of to-day is due to the carelessness which the use of such a machine involves. While claiming the advantages of mixing lime and sand, the mortar mill induces many malpractices, and favours the introduction into the mortar of substances ill-calculated to improve its quality. Public mortar mills are common in some towns in the north of England, where mortar can be purchased, ready for use, at so much a ton. Such accommodation would be most useful to the builders, were the materials of which the mortar was composed and thus manipulated true in kind and character. We fear, however, judging from the placards usually posted up in a prominent place near these mortar manufactories, that the best materials are not used, for they invite the delivery of all kinds of dry rubbish for mixing in their mortar-mill. We were sorry to find, the other day, a similar invitation at a large building in a London suburb.

To mix lime and sand thoroughly, and to secure that their quality was proper, could be beneficially done by a different kind of machine, and the mortar, in its dry state, thus mixed, sold in sacks, ready for subsequent hydration by a careful addition of the required moisture. Mortar thus provided would be capable of easy challenge, and we think it would be less costly than the now existing clumsy and irrational preparation, surrounded, as it undoubtedly is, by numerous dangers. Better reduce the extent of the joints, and use less mortar, more especially when it is evident that the present superfluity is not only wasteful, but dangerous. In the recent disaster at Finsbury Park, the thick mortar-joints exerted no protective influence when the settlement of the foundations of the wall occurred; but had the mortar been composed of first-class Portland cement and good sharp sand, the wreck of a sightly building would have been more circumscribed in its extent.

When the controlling authorities, whose duty it ought to be to examine and test the quality of building-materials, awaken to a sense of their position, we will no longer dread the possibility of living in houses surrounded with dangers owing to their constructive defects; for bad bricks and bad mortar would then be, as they ought now to be, regarded as simple destructives of health and comfort.

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HYGIENE AND HOUSE-BUILDING.

THE modern dwelling-house has recently been discussed more and more in a spirit that is not very agreeable to the art-architect's peace of mind. He finds that many of his cherished ideas are rather rudely dispelled; that what he has always regarded with admiration on account of its artistic qualities is hopelessly tabooed by the exigencies of sanitary improvement. Luckily for him, his *clientèle* is not always composed of those who exact from him a complete compliance with the latest improvements; he manages, in fact, to court those who can respond to his taste and sympathies in design; he is employed because he has acquired a name as the exponent of the fashionable style of the day; and in the assurance that he can create a demand for his services, he little cares or troubles himself about anything else. But, at the same time, he has occasionally to face awkward facts. The desire to break up the exterior of the building in a picturesque manner, to impart the poetry of age, light, and shadow, must often be in strange opposition to the dictates of reason and health. It is somewhat curious, from a hygienic point of view, that in low marshy ground and in thickly-wooded localities, the irregular broken style of house-building has taken deep root, as if in spite of the admonition of common-sense, that such sites require as free a circulation of air round a building as can be obtained; that large masses of luxuriant foliage and umbrageous shelter imply a damp and malarious atmosphere, demanding every precaution to insure dryness, and among them the avoidance of recesses and courtyards. But it is in such situations the architect, in compliance with his artistic impulse, is most lavish of those features, following, indeed, the taste of our forefathers, who were strangely ignorant of the commonest sanitary conditions. To keep a dwelling-house dry in such a situation is a matter of a basement and a few steps to the front door; but steps to the architect who wishes to produce picturesqueness are simply an abomination. To him they have too much of the prim street and suburb style to suit a rural locality and the architecture which rejoices in low-pitched rooms. What would sanitary science demand in a situation such as we have supposed? Its ideal would be something like this. A house with a lofty well-ventilated basement story, raised several steps above the surrounding levels, rooms of lofty proportions, and a plan which favoured a circulation of air round it, if possible as nearly square as could be, and without external breaks and corners.

Again, the "cosy corner," that cherished hobby of the artistic designer, has been pronounced fatal to health and ventilation, pretty and quaint as it is; the air in it stagnates, and through ventilation becomes impossible; no sanitary inspector would for a moment permit it in a cottage, and medical officers have long since condemned the recess in buildings intended to receive the sick. In the planning of private gentlemen's houses, it is permitted, and permitted too in various places on landings and passages as well as in rooms where no air or light can penetrate. But a still more fatal infatuation is the dark passage, corridor, and stair. This is now considered somewhat in keeping with the style; but, as a matter of fact, it is invariably the sign of crude and ill-digested planning. When a novice begins to plan a house he generally makes a number of passages; he has little idea of arranging his rooms round a hall; but the old method of planning has brought about the corridor system. There was an open court, and a cloister or corridor of communication to the several rooms, while others led to the offices, and this sort of plan has been copied in many recent houses, without thinking that the expenditure of space was a matter of minor consideration during the reigns of the Tudors and Stuarts. The separation of the offices from the body of the house is a point equally demanded by sanitary laws, but very seldom effectually conceded. The offices are allowed to intermix, instead of being separated between themselves.

Architects have not yet acquired a code of rules for the proper arrangement of these buildings. Isolation is a special characteristic of English planning, but it may be made to increase instead of lessen labour. In sanitary planning there is a great deal more implied than the shutting out of noise and smells from the principal rooms. The kitchen ought to be free from the contamination with the laundry, and the butler's pantry is better placed near the dining-room than in awkward proximity to the duties of the housemaid. Yet we are constantly seeing arrangements in which all these matters are glaringly disobeyed. The utilities of a dwelling-house demand a scheme which few architects are willing to make for them. We have seen wine and beer cellars built as lean-to sheds, in which it is impossible to retain the equable temperature so necessary; and a location of other offices which defies any rule of convenience. We might go on to name other points where the artistic designer and hygienist are at open variance, such as small windows, large fireplaces, and the position of the chimney-flues. As regards the latter, the chief sanitary principle is utterly opposed to the Gothic idea of making the chimney an external feature, and placing it to relieve gables and blank walls. The position of the fireplace cannot always be regulated by such a hard and fast principle as that of placing it against an inside wall for the sake of economising the heat. Other rules have to be considered, of even greater moment, as, for instance, its relation to the door, and the occupants of the room. It should be so placed that those sitting round it may not be exposed to the direct draught from the doorway, nor be so close to it that every entry would be an intrusion; so that we see the architect has to consult conflicting points of his plan. No one will deny that chimneys grouped together, and placed in the interior walls, are more economical, as no heat is wasted externally by conduction through the outer flue, and that the house benefits to the full extent by the passage of the flues through it. The only doubt we have is whether the designer takes account of either of the principles we have hinted at, but is not guided rather by considerations of external effect. Even the "hob-grate," which is now turned out largely by several manufacturers who would have laughed at them a little while ago, is an obstacle to the advancement of heating on sound principles. Even the disciples of "Queen Anne" confess to its inefficiency and liability to smoke. Mr. Stevenson, in his new book, says of the hob-stove:—"I remember the protest against them of a manufacturer who made one for me about twelve years ago, that he was removing them from old houses every day. He now supplies quantities of new ones cast from old patterns. In my experience they are an inefficient kind of grate, giving out little heat, and liable to smoke. This may be cured by lessening the width of the opening above the hobs, so that the smoke is guided up to the opening of the flue." Yet architects of the school use hob-grates daily, in spite of their admitted defects. In this matter of heating, indeed, fashion has waged war with sanitary science for years, and we should like to know how many modern residences are warmed by hot air or water, or even so simple a plan as an apparatus connected with the kitchen-boiler, which has been used with perfect success.

In the arrangement of bedrooms to many of our large modern houses, it is often curious to notice what perverse notions prevail in respect to the placing of doors, windows, and fireplaces. Sometimes there is no position in which a bed can be placed, unless it is squeezed between a door and a fireplace; the window is often directly opposite, and there is little space for furniture. In the appointments of dressing and bath rooms, and w.c.'s, the architect leaves much to be determined by chance and individual caprice. In the ventilating details the engineer can do what he likes. Few houses are designed or built with any pre-arranged plan for warming or ventilating them. We should be sorry to see every house of importance made a laughing-stock by the introduction of the "fads" of ventilating engineers and patentees, and we might easily imagine such a thing as this; but architects have themselves to blame for allowing every inventor to try his experiments on their buildings at their employers' cost, an evil which might be avoided if the principles of the science of heating and ventilation were thoroughly understood, and provided for in the plans and specification. We might extend these observations to the effect of light in dwellings, the value of the ceiling in aiding the illuminative effect in rooms, and the necessity of keeping it a light tint, if not perfectly white, so as to reflect the small amount of light a window gives, which has been calculated to be only about a forty-eighth part of the full light. It is unfortunate, at least, our having to admit that this element of health is allowed to struggle in the best way it can, and frequently when it does enter scantily into our apartments, is absorbed by dark and dismal walls. Such questions as properties and materials, their absorbent and moisture-retaining qualities, their conductivity of heat and electricity, the effects of colour on health, particularly with reference to wall-papers, are beginning to thrust themselves before every enlightened individual, and must, sooner or later, enter into the construction of our buildings in a more decided manner than even our sanitary authorities are prepared to admit. As our towns enlarge their boundaries, so must those elements most conducive to health begin to assume their due weight in the design and construction of the dwellings around us.

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A RECENT VISIT TO RUSSIA.

FOLLOWING in order of interest, we have of the churches of the Kremlin at Moscow, to notice

THE CATHEDRAL OF THE ARCHANGEL MICHAEL,

otherwise the Mausoleum Church, an adjoining building to the last described, of which it is said to be partly a copy. This church was founded in 1333; but the present building dates from 1507, and is reputed to be the work of Aleviso, a Milanese. It would appear that not only the churches, but the walls of this great citadel, were built from designs of Italian architects. We fail to trace the Classic types that must have been the familiar outcome of such artists; but this is to be explained by the fact that they were compelled to follow the line or style of design existing in old buildings of a national character. Theoretically, we believe ourselves in the presence of works designed by Byzantine artists, whereas practically they are the special outcome of Italian artists. It is one of many proofs that the architecture of the East had become the orthodox style, and that no feeling less than one of a sacrilegious character, would have tolerated any other. We have here again the same square apartment representing our nave, aisles, and transepts, with the same four columns therein, supporting the central dome. Externally, we have the same rough-drawn whitewashed walls, the semicircular gables, and the fine gilded domes, the supporting walls of which are pierced with long narrow lights, which are about the only windows in the fabric. Not being the High Church of the Metropolitan, we miss the important cluster of eastern chapels, repeated as it were story above story. Here we have three chapels, the central one graced, as is usual, with an apsidal end. As enlargements, no doubt consequent upon the enormous space absorbed by the Royal tombs, smaller chapels are pushed out from the square apartments, flanking the main or central chapel, and a lean-to, or south aisle, is added to the nave. We fail to recognise any architectural details worthy of note, and hence the fact that restorations followed during the years 1772, and 1812, are of little moment.

This church, which is by no means large, is literally filled with tombs; they are ranged along the walls row after row, and placed with their ends towards the great columns, until little further than passages or aisles are left for the worshippers. From 1341, until the time of Peter the Great, the rulers of this great empire, both of the Kurik and the Romanoff dynasties, found a resting-place within these walls, and their tombs to-day are no less than forty-five in number. We have, in connection with the palaces, alluded to the old custom of isolating the female part or portion of the community, an institution painfully apparent within these walls, but one set aside in the more modern mausoleum church at St. Petersburg, for there are no Queens of Russia interred in this Imperial building. These members of the imperial house, up to the time of Peter the Great, were interred in the Church of the Ascension Convent, a nunnery founded by St. Eudoxia in 1389, near the Holy Gate of the Kremlin. Their tombs are placed in a double row round the walls, that of the foundress being of silver. Those of the highest historical interest are the tombs of the mother of John the Terrible, and that of the first wife of Peter the Great, whom he forced to take the veil, and retire into this convent, those next in interest being the tombs of four of the six wives of Ivan the Terrible. Returning to our subject, we may note that the tombs of the Tzars are of a mixed order of merit: they are all uniform in size, about eight feet long, four feet wide, and four feet high, coped or roofed at the top. The bulk of those are covered with faded scarlet palls, on the top of which are the titles of the deceased, surmounted by crosses, and on the bottom are ornaments, all worked in yellow silk. The material of a great portion of these tombs is brick, the covers or copings being of wood. At first glance we are led to infer that they were temporary erections, something more consonant with the resting-place of kings being intended to follow. Such was not the case; it is the custom of to-day, as noticed by us in our visit to the modern mausoleum church in the St. Petersburg citadel, to observe a marked degree of plainness in the Royal tombs, the only advance noticeable being from the brick and wood under notice, to plain, polished, white, veined marble.

The mode of perpetuating the memories of our kings has been, and still is, by recumbent effigies, a mode that seems peculiar to southern and western Europe. Here the faith that does not admit of graven images extends to the tombs of kings, and hence they are represented by life-sized pictures, fixed on the adjoining walls. These reputed portraits are painted on sheets of metal, the figures being shown in long white robes. It is worthy of note that this portion of the ancient customs, pertaining to the departed great of Moscovy, is not retained in connection with the modern interments at St. Petersburg, and as effigies could not be resorted to, the plainness of the tombs may there be accounted for. The most remarkable tomb in the mausoleum church of the Kremlin is that of Dimitri, the youngest son of John the Terrible, who, as the last of the Kurik dynasty, a race that had wielded the sceptre for seven centuries, was murdered by Boris Godunof the usurper, a crime that was parallel to that committed by Richard III. in the tower of London. This young prince, whose remains were afterwards miraculously found and conveyed to this resting-place, has long been a saint of the Russian Church, and in the orthodox manner his bones are shrined in a silver tomb, through the top of which the fore-head of the skull is exposed for the worshippers to kiss. Near by, stands a tall silver candlestick, presented by the people of the town where the murder was committed; and on the adjoining column is fixed his portrait, besides which are other relics, consisting of his shirt and handkerchief, marked with blood, a silver toy purse, fourteen silver coins, and, as if to complete the furnishing of this chamber of horrors, the fatal knife with which the foul deed was committed. This tomb suffered by the pillage of the French soldiers in 1812, as did that of another fixed in a side chapel, the object of booty being the silver of which they were composed. In this act of desecration, the body of the ill-fated Prince was removed from its costly setting, and cast on the ground, from whence it was rescued by a pious monk, when the church was a store-house of the French. The present silver tomb is a modern work, and is the only one of the kind in the church, the other in the side chapel being restored or replaced in bronze.

John the Terrible, by a curious anomaly, is interred nearer to the high altar than any other monarch, in which position he may be supposed to benefit most by the services performed twice a year for the sins of all those interred within these walls, services which are paid for by vestments and church vessels presented to, and exhibited by, the priests. The altar-screen is much adorned with gold; but it is not endowed with any miracle-working pictures; the most precious shrine is one containing a drop of blood of St. John the Baptist. Amongst the treasures of this church may be counted a fine illuminated version of the Gospels in a gold enamel cover, studded with precious stones, the date of which is 1125; a cross of John the Terrible, set with large pearls, and remarkable for containing an emerald one-third of an inch in diameter; and an old lantern of mica, associated with the same monarch in being brought by him from Novgorod.

Having noticed these two celebrated churches of the Kremlin, and incidentally the one forming part of the Nunnery near the Holy Gate, our task of completion, although these are but half the churches of the Kremlin, is but a short one. Of these, the

CATHEDRAL OF THE ANNUNCIATION,

standing at the south-west corner of the mausoleum church, claims a passing note. This is a still smaller church of the same type, founded in 1291, and last rebuilt in 1489, since which it has undergone two restorations, the last being in 1868. The eastern chapels are three in number, and semicircular in plan, and from the fact of this arrangement admitting of no extensions, a cluster of buildings, two or three stories in height, the latter being crowned by two domes, is attached to the southern side of the nave. The interior of this church is remarkable for the floor being of jasper and agate, the gift of one of the Shahs of Persia. The walls are adorned with numerous pictures of great age, brought from Novgorod the Great in 1547, a date that fixes one of the restorations, and the first occasion of the domes being decorated with gold. It is natural to find these churches of the Kremlin bound up with some great office of the kings; we have seen in one case a church devoted to their coronations, and another to their interments, both which offices must bring them considerable gains. In the present case, as if by endowment, the Annunciation Church has the right of baptism and marriage in connection with the reigning family, an an ancient right that has no doubt been entrenched upon by the churches of the more modern capital. Amongst its vicissitudes it counts the fact of being transformed into a stable during the French occupation of the city. The altar-screen is rich with holy pictures ; that of the "Virgin" is endowed with miraculous powers. It was carried into battle as a standard by Dimitry of the Don, in 1389, and by Boris Gudunof in 1591, when the army of the Khan of the Crimea was under the walls of Moscow. Amongst the ecclesiastical treasures is the sponge in which vinegar was offered to our Saviour, a portion of the stick with which he was beaten, a portion of His blood, and His crown of thorns.

The next building of this class, and one which completes the group, standing in the centre of the holy and historic inclosure, is the

CHURCH OF THE SAVIOUR IN THE WOOD.

This is situate to the north-west of the others, in which position it is surrounded by subordinate parts of the Royal Palace. It is a small construction of the ordinary type, and is remarkable as being the oldest or parent church of Moscow, the original being built of wood. Its greatest treasure is the relics of Stephen of Perm, the first Christian missionary and martyr in Russia, the incidents of whose life are depicted on the walls. This church was converted into a prison by the French, and in it Count Perofski and other captives were housed for two weeks upon straw, and were only rescued when nearly starved to death.

In completing our notice of the ecclesiastical buildings of the Kremlin, we must give a passing allusion to the

MIRACLE MONASTERY,

near the Holy Gate, an institution dating from 1365, that contains within its inclosure two churches. Drawing a parallel with England, we may call it the "Lambeth Palace of Russia," for it is the residence of the primate, or metropolitan, of the Russian church. It was founded by Alexis the Patriarch, a saint whose blessing is still invoked on behalf of the young about to commence their studies, one who is still pilgrimised by the peasants of his holdings, who come on his name-day to pray at the shrine of their lord. The principal church of this Monastery is the Cathedral of St. Alexis, a building that has been repeatedly restored by the heads of the present dynasty. It was hardly used by the French, the sanctuary being turned into a bedroom for Marshal Davoust. The silver tomb of the founder, placed against the south wall, was carried away, and the remains of the founder were discovered under a heap of ruins after the invaders had taken their leave. All is now in order ; but the insults offered to these most holy shrines of Holy Russia, by the French under Napoleon, can neither be forgotten nor forgiven. It was some comfort to this wounded people to see this sacrilegious host annihilated in their wintry retreat ; to see the keys of Paris hung on the walls of the Zazan Cathedral, and to see the erection of the celebrated Alexander column in front of the Winter Palace ; but the wound, as everything about the Kremlin shows, will never heal. The other church, dedicated to St. Michael, is of equal age, and has recently been brought into a good state of preservation. Architecturally, they in no way differ from those we have already noticed. It is not in Moscow that architectural innovations are to be looked for ; the reforms of Peter the Great have not been pinned upon this ancient capital, which, like Haddon Hall, amongst the mansions of our nobility, stands as a faithful record of the past.

(*To be continued.*)

SPAIN IN 1880.—RESTORATIONS.

RESTORATION, in the sense in which we use the word, is a manner of work yet new to Spain. The Church, which is still a great power in the land, and which possesses, of course, the principal part of the works of the past, to which restoration applies, has had more regard for its wants and services, than for any archæological spirit, in the repairs which have been occasionally necessary to its buildings. However, there is becoming evident, in furtherance of the views of the educated classes, who are learning to look to these subjects, some acknowledgment of the claims of the specimens of ancient art, to be a little better guarded from destruction. One finds, sometimes, upon the façade of an archæological relic, a board upon which is painted the style and title of a commission for the preservation of artistic monuments; the name of the particular monument there being preserved. Beyond fixing this board, and installing an ancient dame with authority to receive the "reales" of inquirers, there is generally but little done. And even this is only applicable to such buildings as are not in, or have passed out of, the hands of the church. Sometimes an unguided attempt at the collection of a museum is found. These often look as if the collectors had been suddenly converted from the one extreme, of neglect, to the other, of the conservation of everything. But one must not grumble too much at this. There are often several interesting fragments among the rubbish brought together thus, in some disused cloister or desecrated chapel.

And restoration itself is a work which it is not advisable to over-stimulate, lest, being undertaken prematurely, insufficient knowledge may cause more mischief than advantage. The present unrestored condition of antiquities is a strong attraction for the artist, and one which will probably decrease ere long.

The principal works now being executed, which I encountered, are Leon Cathedral, the Alhambra at Granada, the Alcazar at Seville, and the church (formerly a synagogue) of S. Benito, called El Transito, at Toledo.

It must not be inferred that the Church is altogether neglecting or ill-treating its architectural inheritance. Some of the cathedrals have been restored or repaired at various times with more or less success; but the work thus done is not of much value archæologically.

The cathedral of Leon is, just now, an unusually interesting study. The works, which have been long in hand, are well advanced in the taking-down and scaffolding stages. A thorough description of the edifice will be found (by those who are not already acquainted with its peculiarities) in Street's "Gothic Architecture of Spain." It will suffice, therefore, to say that the present building, which occupied the site of a former one of the 11th century, is a structure in the best period of the Gothic style ; having been completed about A.D. 1,300. It is altogether French in character ; and, unfortunately, so light in construction, particularly about the clerestory and triforium, that long ago its weakness was the subject of consideration, and the outer openings of the tracery, &c., of each bay, in these stories, had to be filled up with masonry.

The lines of shafts and walls are, in many cases, very much out of the perpendicular, but not always so as to be dangerous. Some of the flying buttresses had to be restored at a former date, probably when the strengthening of vaulting shafts was done. The thrusts outward of the vaults, have, however, caused much disturbance of the walls, and the thrusts inward of the aisle vaults have made very evident impressions upon the shafts of nave. I should add that the building consists of nave of six bays, and aisles, with two western towers. Transepts, choir, and apse with aisles and chapels. These chapels are, at present, reserved for ecclesiastical uses, being screened off from the rest of the church.

The work of restoration was formerly in the hands of Senor Lavinia, who died in 1868 ; and Senor Don Andres Calligo was appointed. Then succeeded Senor Don Juan de Madrazo (an architect known to the English profession by reason of his visits to our country), lately deceased.

At present the charge has been undertaken by Senor Don Demetrio de los Rios. There is, of course, a large number of artificers upon the work ; but not enough to carry it on with the despatch not only desirable, but necessary, for such thorough restoration. The building is thus too long exposed in a half-demolished condition to the weather, and the destructive little casualties attendant upon such operations. The tombs and other rich delicate work are not sufficiently guarded from breakage, &c., and the beautiful stained glass has already been sadly damaged in places. I suppose that eventually it will nearly all have to be removed for the execution of the other work. It should be done at once. Or, if this is not the case, more care should be taken that holes are not poked through it.

The crossing and transepts, the greater part of nave, and part of choir are full of scaffolding, &c. This is necessarily a work of considerable magnitude, being, not only the means of access, but the support of the work and of the heavy centering for vaults, and, in some cases, the shoring of the old portions of the structure. It is elaborately designed and most carefully executed. Indeed, it appears to me to be somewhat extravagant in these particulars. It is principally of wrought timber with trusses, and centerings, and accessories, all neatly finished ; with such things as cut ends, &c., as if it were the end, instead of the means of the work. And a comfortable staircase with rounded handrails and convenient landings, provides easy access to the various stages. And, lastly, the material is freely expended in unnecessarily complicated framing and heavy scantlings. Of course, it is better to be lavish than dangerously economical, and it is more pleasant to see and use nicely-finished scaffolding, but, if money is scarce (which I understand is the case), the amount expended in these temporary constructions is, to say the least, liberal.

Nevertheless this timber structure is a fine work, and it is without doubt well designed in principles. With the exception of one or two trussed centerings which I noticed, all the members are well relieved of cross stains by the scientific placing of struts and ties. The greater part of the weight, in the nave, is carried down by massive principals on to the sill of triforium. These are not tied in actually at the feet, but the masonry at this level is so solid that it can easily resist the thrust ; and the position of these primary timbers is a very convenient one. In the crossing the weight is brought down by posts, braces, &c., to the floor itself. Analysis of this maze of timbering (as it appears from below) is easy upon a closer inspection. Then it can be seen, too, that there is more than the simple scaffold. In shoring, there is an ingenious arrangement for maintaining a corrective pressure against leaning portions of the work. Across the nave, for instance, in line with the transept walls where the last bay of the aisle vault has pushed forward the main shafts, there is a frame, the principle of which is best described by supposing the tie removed from a flat king-post truss. Of course, a comparatively small weight upon this is sufficient to cause an enormous thrust. And, at the same time, the pressure is elastic, and automatically following in its action. I need hardly say that it is not quite so simple an affair as the two principals and the weight spoken of.

The outside scaffolding, &c., is of lesser interest.

So much for the intermediate work.

The actual building operations are, at present, principally in connection with the reconstruction of the façade of the S. transept. This has been altogether taken down, and is being rebuilt. The new work is now up to about the sill of the great window over the portal and arcading. It is being executed in a rather hard white stone, not of the same fine warm tint as the old. It comes from the province of Burgos. But very little of the old work is reinstated. The fine doorway is, like the rest, almost entirely new. I think the tympanum, with its relief carving, is the only piece of old material retained.

But the drawings, which the architect kindly showed and explained to me, are very carefully and thoroughly made (indeed, I am almost inclined to deprecate needless expenditure here again) ; and full-sized models are used in preparing and determining details of carving, &c.

Upon the subject of drawings, I may be permitted a little digression to note the curious fact that the drawing-board and T-square, as mathematical instruments, are unknown in Spain. Draughtsmen manage to do all their work with parallel rulers and set squares. An engineer I met with, whose English training had modified his methods, told me he had to send to London to get a board and square of proper construction.

The Alhambra is the next important work of restoration. Indeed, it may claim to rank first, as being of an edifice unique and pre-eminent in its style and situation. Constructed during the period when the Moors of Spain had their resources and wealth compressed, so to speak, in their last remaining kingdom of Granada, the Alhambra was almost the realisation of their Oriental dreams of magnificence and beauty. My impression of what remains of it is, that description is inadequate to convey a just idea of the peculiarly impressive beauty of this extraordinary work. It is one of those things which, unless actually seen, cannot be understood. I believe the secret of its greatest charm lies in one word—"Idealism." The decorative system is born, not of imitation, nor historical teaching, nor faith, but of reason; seeking the principles and the sources of beauty. And that system is abstractly more perfect than others, as is reason broader and deeper than the beauty-inspiring instincts. It is not of architecture, but of decoration, that I speak thus.

But it would be out of place here to enter into such questions, or even to describe the parts and features of this beautiful and delightfully situated fortress-palace. Descriptions better than I could give are accessible; and failing the reality, its representations are valuable. Therefore, presuming in my readers a knowledge of its form, I will give my notes of the work lately done and now being done upon it.

The works are in the charge of Senor Don Rafael Contreras, a gentleman lately elected a member of the Royal Institute of British Architects, whose devotion to this work shows a true artist's love for it. The operations are not more of restoration than of continual repair. The structure has arrived at its period of old age; and it is rather continual care and preservation, than an effort to restore its original brilliant splendour, which is being carried on.

For this purpose, a small staff of quietly-working artificers is permanently retained, and these, acquiring the spirit of the style in which they labour, and inspired by their able chief, produce results which, so far as excellence is concerned, are extremely satisfactory. It is a pity that funds are not sufficiently abundant to allow of a more extensive restoration, during, at least, a short time, and also to obviate the necessity which exists for economy in the replacing of certain more expensive details. The elaborate wall tile-work, for instance, which was carried round the octagonal shafts with pains and expense unspared, as may still in some positions be seen, is being restored in the "Chamber of Judgment" (which opens upon the "Court of Lions") with an ingenious inlay of coloured plaster. This is itself good, and deserves notice as a means of decoration, but it is not a restoration of the tiles.

The "Court of the Lions," which has suffered much in the latter period of its existence, is being slowly restored. The new plaster wall enrichment, which is cast in moulds carefully prepared from the best preserved of the ancient work, is very well done. Indeed, it is difficult sometimes to detect which is new and which old. This work is fixed in slabs, and the joints finished off with tools, in the same manner as the original. Some of the stalactite work, too, has been wonderfully well replaced. The old eaves are being removed piece by piece, and replaced by a wood cornice, for which, I suppose, the architect has precedent. I hardly dare to criticise; but I think that the upward tilt of the brackets is not very satisfactory, as one can see by the internal height that they are not really the rafter ends they seem to be. The colour (a stain, I believe, but it may be the colour of the wood) is, at present, a rather strong contrast with the light grey of the old plaster.

The beautiful great wooden doors of the "Hall of the Abencerrages" and of the "Hall of the Two Sisters" have had portions of their elaborate panelling and carving replaced, and this too is, I think, very well executed. The decorative surface is a sort of inlay or plating of thin tablets of wood upon a massive framed door, so that the substitution of the nicely-joined pieces is a comparatively easy matter.

There is not much colour left in this court, as it is rather open to the weather, but in some sheltered positions there yet remain valuable traces, which it is to be hoped, will not be obliterated without good cause. I understand that, some little time since, the columns and caps and bases upon the south side were carefully cleaned. They are nice and white, but some fragments of the delicate frets and scrolls, which once covered the smallest details, have been thus lost.

And such remains have great value in the discussions (not yet likely to be terminated) as to the colours, and positions of them, originally used.

The pavilion at the west end, which, with some other portions of the palace, was barbarously patched at some former period of royal attention, will soon, it is probable, receive some better restoration. It would be well to reconsider the roof (constructed a few years back) of the opposite pavilion. The coloured glazed tiles are not of agreeable tints, and look as crude and raw as if put up yesterday. They are, therefore, not in harmony with the rest of the work, and they contrast most unpleasantly in colour with the deep blue sky which forms their background. The floor of the court (the open part) is now bare mossy gravel. In some older accounts, this place is described as being a garden. Perhaps the gravel may have advantages, but it ought to be kept spruce and weedless, or else altogether given over to vegetation. Scarcely anything has a more desolate appearance than the damp green surface of earth, with stray blades of grass here and there.

The chambers at the eastern end of this court are undergoing repair to their damaged details, &c. The paintings are still fresh and well preserved; but, of course, I cannot make any comparison with their state at earlier periods. They look as if they might last for centuries yet. A portion of the flat wood ceiling which has been replaced with new, is rather awkwardly done, owing to the effort to fit a rectangular framing into a twisted and irregular space.

The "Hall of the Two Sisters" still claims to be entirely original and unrestored. May it long remain so! There is still plenty of colour left in this grand department, and the walls and gorgeous stalactite ceiling are astonishingly free from any serious settlement.

There are, however, traces of the percolation of water from the roofs, which will do mischief unless arrested.

Some of the wall tiling shows a failing I had not expected. The glazed colour has here and there flaked off from the tile, a very little yet, apparently through the disintegration of the earthenware beneath.

I should like to mention an observation I made of the construction of these elaborate dados. The tiles are not of such proportion as the flat things we usually so name; but from their frequent narrowness and relatively great thickness, are more like the familiar wood brick-toys of our children. And they are so firmly set that a breakage goes across the mass regardless of the joints. From inspection of the position of signs of movement, the cracks in angles, &c., it struck me that the work had been, wherever practicable, fitted together in large slabs in a horizontal position (perhaps face downwards), and strengthened with a backing of cement fixed thus entire upon the walls. At any rate, this conjecture is perhaps worth consideration in the construction of similar work.

In the "Hall of the Abencerrages," some bits of experimental colouring have been done. They are not very satisfactory, and I hope something more certainly correct than they are will be executed completely.

The charming little Hall of the Baths is having its colour entirely restored. The effect of decoration of this class appears to great advantage in such a chamber, where recesses and galleries afford a pleasing variety of light and shade. On the whole, the work is very well done. Perhaps some fault may be found with the red colour, which is a little lacking in depth, and the gold has rather a bronze-like dulness, which does not exercise so neutral an influence upon the harmonies as would the brighter gold I expected.

The small external court upon this lower level is fresh and gay with the verdure and fruit of its oranges, and forms a pretty termination to the view from the "Hall of the Abencerrages," across the court, and through the Hall of the Two Sisters, and the little chamber beyond. This favourite "vista" of the artists is all in good yet picturesque preservation.

The "Hall of the Ambassadors" is also in good condition. There is nothing being done in it now; indeed there is little necessary, unless it be the replacement of certain rather awkward bits of "restoration" of a previous generation. Some of the celebrated inlaid tiles have lately been maliciously picked to pieces by inquisitive visitors, notwithstanding the vigilance of the custodians of the place.

The "Court of the Fishpond" is trim, and in good repair; but, unfortunately, it is rather bare of decorative details, and what there are—nice little bits of plaster-work around doors and windows—are nearly all restorations.

The smaller apartments and chambers are granted what attention can be spared; but some parts, stalactite work, and wooden ceilings, &c., are pressingly in need of attention. Their decaying condition will, unless they are speedily repaired, place them beyond conservation. It is because of this need that I remark the desirability of a greater expenditure for a short time. If these pressing things were put into good condition, the amount of labour at present at command would, doubtless, suffice to keep them so.

The never-completed Renaissance palace of Charles V. remains deserted, roofless, and empty. If it were not for its intrusion here, which one cannot help resenting, it would receive more attention than it does. The vast circular "patio," or court, with orders and vault, is an interesting thing, if only for the stone-cutting science displayed. And the Ionic façades, with relievos, &c., are not altogether devoid of interest. But they are eclipsed.

The Alhambra does not call for much restoration to its outer walls. Externally it is a grim old fortress, whose venerable towers and crumbling walls of ruddy, time-stained stone, would rather suffer than gain by restoration to trimness.

The elms which have been planted so thickly and plentifully upon the steep slopes of the hill, are just now perhaps at an age of youthful slimness when they add most to the effect, by adorning, without hiding, the ancient edifices. Altogether the Alhambra is, as a place of delightful surprises, deeply impressed upon my memory, one which I shall always recommend to my fellow-creatures, young or old. Master or student, artist or tourist, the visitor will find there an abundance of the "instructive amusement" which it is the fashion nowadays to seek.

I was indebted for some assistance in finding things of interest (which the guides take no note of in their routine) to Mr. Estanie, the British vice-consul at Granada, who passes most of his time with "thick Whatman" and water-colours in the courts of the Alhambra, and whose obliging courtesy in gratifying inquirers is equal to the thorough familiarity with the place which he has acquired in his artist-intercourse with it.

The Alcazar at Seville, although the original building dates from the 10th or 11th century, is not, strictly speaking, a Moorish edifice, as it was re-erected for the Christian king Don Pedro the Cruel, by Moorish workmen, in the 14th century. Restoration was begun in 1857, and work is still being carried on; but it is a not altogether advantageous mixture of things, Spanish and Moorish—ancient and modern. Fireplaces and incongruous paintings have been introduced by various monarchs who sought comfort and fame. And the gardens are to-day a favourite resort when they are open to the public, and are being adorned with most vile garden-architecture and paintings. Nevertheless, there is much that is beautiful and much of archæological interest to be found here, and the work of restoration and repair has doubtless been, on the whole, beneficial to the interests of art.

San Benito (el Transito), at Toledo, originally a synagogue, afterwards a church, and now an "artistic monument," is being restored. The building is in a style of mingled Gothic, Moorish, and Hebrew ideas and details; but it is not the incongruous medley these words, unqualified, might indicate (see Street's "Gothic Architecture in Spain"). There was, when I saw it, a scaffold in the interior for access to the range of windows under the roof; but as the workmen were not there I was unable to inspect the works closely. I am sorry, therefore, to have to only mention this work without comment.

R. W. Gibson.

YORKSHIRE ARCHÆOLOGICAL ASSOCIATION.

THE 14th annual excursion of this society took place on Wednesday week, when Rotherham and Wentworth were visited. Leaving Leeds by special train, the party, numbering about 100, proceeded from Masborough by carriages to the Roman camp of *Templeborough*, where a paper was read by the Rev. W. Blazeby. This *castrum* has long been recognised as Roman, but antiquaries formerly considered it a mere summer camp of no special importance. Explorations made in 1877 and 1878 have, however, thrown considerable light on the history of the place. We now find that the earthworks, which inclose an area of rather more than four acres, are not Roman, but were thrown up on the site of the Roman station after the departure of the legions. Several feet deep within the banks of earth have been found abundant remains of Roman pottery and tiles, and among the latter tiles bearing the stamp of the Fourth Cohort of the Gauls. C IIII. G. There are roofing, bonding, hypocaustal, and flue tiles in abundance, proving the existence of permanent buildings, with the home comforts of warmth and shelter. In the well, found at the south-east corner of the *castrum*, were discovered, besides Roman pottery of a coarse kind, many querns or handmills of undoubted Roman origin, as well as a number of leathern sandal-soles, such as have been unearthed among the débris of Roman London and other places. In the middle of the south rampart the remains of a gateway, much mutilated, were come upon, and westward, within the *castrum*, the foundation-walls of a building now exposed. As soon as the masonry *in situ* was discovered, the course of it was carefully followed until the work resulted in uncovering the extensive foundations of what appears to have been a public building. In the course of this work it was made evident that two buildings had existed at different periods on the same site—the latter one rude and plain, the earlier one graced with colonnades on the east and south. On the south, the Roman colonnade was entirely obscured beneath a road surface; on the east, later walling had been built upon the bases of the fallen columns. About and beneath the foundations of both periods were abundant evidences of the action of fire—burnt and blackened stones and masses of charcoal and cinders. Roman pottery, in great abundance, but of no special rarity, was found, and also a few coins, ranging chiefly from Titus to Antoninus Pius. The discovery of these remains raises some interesting questions affecting the Roman geography of Britain. The name of the station is still unknown; but it is clear that after the time of the Romans it was twice occupied and fortified by another people—once when the second building was raised, and again when the earthworks were thrown up. On this point the late Rev. D. H. Haigh, of Erdington, remarked, "I suspect you have found the *villa regia* of Eadwine, and probably the basilica which he made therein, which were destroyed by fire by Cædwalla and Penda, in 633 A.D. This was in *campo dono* or in Donafield, and I have always looked for it along the valley of the Don, upwards from Hatfield, where the battle was fought. Constantine gave to the Church several basilicæ, halls where justice was wont to be administered, and they became Christian churches. May not the Roman building in which you correctly recognise a court of justice, have been made into a Christian church, and the narrow aisle added to it, on the ruins of a portico, by Eadwine, and consequently the name of 'Temple' have been added to the 'Burg' by the people?" The explorations have so far touched only the southern part of the *castrum*. About two-thirds of the entire area remains unexamined, and many interesting discoveries may be anticipated on resuming operations. On the opposite side of the turnpike road a sepulchral urn was ploughed up more than forty years ago, and very likely an examination of the ground there would disclose the whereabouts of the cemetery. The company next drove to *Wentworth Woodhouse*, where they were permitted by Earl Fitzwilliam to see through the principal apartments of his mansion. They were received in the Pillared Hall by the Rev. Dr. Alfred Gatty, Vicar of Ecclesfield. The house is in core a Tudor structure, and the internal courts and chambers of Henry VIII.'s time still exist. The garden front was rebuilt in the early part of the 18th century in brick with stone quoins, and in the next generation the present park front was re-erected after a design by Flitcroft. The interior was not completed, however, till 1806, when an upper story was added to the wings. The house now covers an area of 3 acres and 37 perches. The chief interest in the pictures at Wentworth centres in the portraits by Vandyck and Sir Joshua Reynolds; those by Vandyck illustrating the stormy years preceding the Commonwealth, and those by Sir Joshua belonging to the time of the second Marquis of Rockingham. To the east of the house, but outside the boundary of the park, is Hoeber Stand, a lofty pyramidal monument erected to commemorate the suppression of the rebellion of 1745. On a richly-wooded eminence, south-west of the house, may be seen a Doric column, known as Keppel's Column, and built in honour of the victories gained by the British fleet under Admiral Keppel. In front of the house, beautifully situated among the trees, stands the mausoleum, erected by the fourth Earl Fitzwilliam in memory of his uncle, the last Marquis of Rockingham. This building contains a fine full-length statue of the Marquis in his peer's robes, and represented as if in the act of speaking. The room is skilfully lighted, and allows the work, a masterpiece of Nollekens, to be seen to advantage. The church has been partially pulled down, the only parts remaining being the tower and chancel, built by the second Lord Strafford, in 1684. This portion of the building is intended to be a mausoleum for the Wentworth branch of the Fitzwilliam family. The chief interest in the church arises from its being the burial-place of the great Lord Strafford. His monument is on the north side of the Communion-table, and therein he is represented in a kneeling position. There are two fine altar-tombs; one of Thomas Wentworth and Margaret Gascoign, his wife, the other of some forgotten Gascoign. The visitors also had an opportunity of seeing the new church built, in 1877, by Earl Fitzwilliam. At the luncheon at Rotherham, Mr. Thomas Brooke, F.S.A. (Huddersfield), president of the council, mentioned that the Yorkshire Archæological Association now numbered 143 life members and 350 annual subscribing members. The subscriptions of the life members being capitalised, they had an untouched fund of about £750 invested in the bonds of the Halifax Corporation. As they had now almost exhausted the objects of interest in Yorkshire within one day's reach, the council must soon consider how far they would be justified in taking expeditions of a somewhat greater length. The members then adjourned to the spacious and handsome old parish-church of *Rotherham* (a fine specimen of Perpendicular architecture), where a paper was read by the Rev. J. Stacye, Master of Shrewsbury Hospital, Sheffield. On their way from the church to the station for the return journey, the visitors had an opportunity of seeing "Our Lady's Chapel on the Bridge," less ornate than the similar structure at Wakefield, but yet interesting. The exact period of erection is ascertained from a bequest of John Bekying, master of the Grammar School, in his will, dated August 24th, 1483—"To the fabric of the chapel to be built on Rotherham Bridge 3s. 4d." The foundation of the college had been laid one year before. The dimensions of the chapel, which has in modern times been devoted to the vilest uses, is 32ft. 9in. in length, by 15ft. 5in. in width. Not long ago it was used as a gaol, and now it is made to serve as a tobacco-shop. On the way to the station it was pointed out that nothing now remains of the noble College of Jesus, built by Archbishop Rotherham, in his native town, but one side of the quadrangle, now occupied as the College Inn.

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ON THE NECESSITY FOR A REGULAR INSPECTION OF LIGHTNING CONDUCTORS.*

By Richard Anderson, F.C.S., F.G.S.

ON the present occasion I wish to bring under the notice of the Association, a few cases of damage resulting to buildings, which had lightning conductors attached, which have come under my own observation. The adducing of such cases furnishes the best argument, I imagine, not only for a record being kept of all accidents, but of a regular inspection of buildings which have lightning conductors attached to them.

On the 10th of October, 1878, a furniture repository situated at the back of Victoria Station, Westminster, was struck by lightning, although a conductor was attached to the building. The warehouse, which is built of brick, is 110ft., by about 80ft. wide, the roof is flat and covered with lead. At the south-east corner, a slate-covered tower with 4ft. of iron cresting, rises to the height of 20ft. above the roof. To this ornamental ironwork a solid copper band lightning conductor ¾in. broad by ⅛in. thick, and weighing ·43lb. per foot, was attached. A terminal made of ⅝in. diam. copper tube, with three discharging points 6in. long, screwed into the rod 3in. from the top, rose 3ft. above the iron cresting. The rod was attached to the ironwork by means of copper wire, and the band to the slates and brickwork by gun-metal clips. The copper was of very good quality, having a conductivity of 92·00 per cent. The electric discharge fell on the point of the lightning conductor, bending it, driving out two of the discharging points, and twisting the third. The iron cresting was shattered, and considerable damage done to the tower. Part of the discharge was no doubt carried off from the lead roof by the rain-water pipes, which were in metallic communication with it. On testing the conductor shortly after the accident, I got no deflection of the galvanometer needle, and on opening out the earth terminal found the conductor carefully insulated in concrete.

On the 10th of June last, lightning struck the point of the conductor at St. Mark's Church, Skelton, slightly bending it; but did no further damage. The conductor was made of ⅝in diam. copper rope, and had a conductivity of 52·50 per cent. On testing the conductor, while rain was falling, I found the resistance to be 600 ohms. The conductor was buried 9in. among bricks, lime, &c., and carried 15ft. from the building. On Saturday the 26th of June, 1880, a heavy thunderstorm passed over South Lambeth, the lightning doing considerable damage to All Saints Church. The building in question, the style of which partakes of the characteristics of the 13th century, consists of a nave 92ft. 6in. long, 25ft. wide, and 36ft. high to the plate-level of the roof, a chancel 31ft. long, 20ft. wide, and 48ft. to the ridge, also north and south aisles 13ft. 3in. wide. A stone cross 4ft. high stands on the apex of the west gable, and another of similar size stood 92ft. 6in. from it on the east end of the nave, a ridge of red tiles separating them. A ⅜in. diam. copper rope conductor, consisting of 49 wires, was attached to the cross on the west gable, a 5ft. point made of copper tube rising 18in. above it. On the afternoon of the 10th, lightning was observed to strike the point of the conductor, then dart to the stone cross of the east end of nave, throwing it down and injuring the roof of the north aisle. On testing the conductor a few days after the building was struck, I found the lightning rod had no "earth" whatever, the rope being simply stuck 2in. in loose rubbish. The copper was very impure, the conductivity being only 32·10 per cent., or about double that of iron.

In July last about half-past five in the morning, lightning struck one of the chimneys of Normanhurst Court, near Battle, Sussex, notwithstanding a lightning conductor was attached to it. Normanhurst stands on high land, and commands a magnificent view of the whole channel from the South Foreland to Beachy Head. The buildings are constructed of hard blue stone, roofed with Brosely tiles; and are in the style of the age of Francis I. There were two lightning conductors on the buildings; one on an octagonal tower, which rises from the S.W. angle, having a balcony and a lofty stone spire, about 120ft. high, the other on the S.E. chimney, which was struck, about 126ft. distant from the tower. The lightning conductors consisted of 12 copper wires, 15 B.W.G. woven into the form of a band 1in. broad, and weighing ·36lb. per foot. The air terminal which rose 3ft. above the chimney coping, consisted of an iron point 12in. long, covered with a composition which on scraping appeared to be lead; this was attached by means of a coupling joint to a copper tube 6ft. long, and weighing ·28lb, per foot. The copper band was connected to the rod by another coupling joint. The chimney coping consisted of eight ornamental stone pinnacles 3ft. high and 2ft. square at the base. The terminal rod was placed on the centre of the chimney, and insulated from it. The lightning discharge struck the chimney, destroying three of the pinnacles, which, falling through the roof below, did considerable damage. The air terminal was bent, and the composition on the point melted 3in. The wires near the terminal point were likewise partly fused, and, on taking out one wire 25ft. below the terminal rod, I found it so irregular in thickness, that it had to be redrawn before the conductivity could be determined. On testing the earth terminal, I could get no deflection of the galvanometer needle, the conductor being buried in dry earth within a stone wall 8ft. above the fosse, or asphalted area. The conductor on the tower had "good earth." The conductivity of the copper was 80·5.

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* Read before Section A of the British Association at Swansea, Aug. 27, 1880.

In my recently published work on "The History and Application of Lightning Conductors," the following cases, among others, are given.

On the 6th of August, 1878, lightning struck the powder magazine at the Victoria Colliery, Burntcliff, Yorkshire. At the time of the explosion the magazine contained about 2,000lb. of gunpowder. The magazine was an oblong building of brick, 9ft. long, 5ft. wide, and 6ft. high (internal dimensions), and it had a uniform thickness of three bricks. At the end was a heavy iron door, and at the other a lightning conductor, consisting of a copper wire rope seven-sixteenths of an inch in diameter. The point of the terminal rod was about 13ft. above the top of the building, and a similar length was carried into the ground, and terminated in clayey soil at a depth of 3ft. The conductor was fixed to a pole distant about 2in. from the end of the building opposite to that in which the iron door was fixed. *It was not connected with the iron door in any way.* On testing the conductivity of the copper rope it was found to be only 39·2 instead of 93 or 94 per cent. The conductor should not have been insulated, but brought down the pole, carried along the roof down the iron door-post, and so into the ground.

In August, 1879, lightning struck one of the pinnacles of the tower of Cromer Church, Norfolk, although on another pinnacle only 27ft. 6in. distant, a good copper conductor, having a diameter of $\frac{5}{8}$ of an inch was placed. On testing the conductor by means of a galvanometer, I found it and the earth connection in thorough order. In this case, a point should have been placed on each of the pinnacles, and joined the main conductor.

In May, 1879, the steeple of the Church at Laughton-en-le-Morthen was struck by lightning and damaged. The spire, 175ft. in height, had attached to it a thin tube made of corrugated copper, about $\frac{7}{8}$ of an inch in external diameter, and $\frac{5}{8}$ internal; the copper being 1-32 of an inch in thickness. It was made in short lengths joined together by screws and coupling-pieces, but there was no metallic contact whatever between the pieces, which were much corroded. The conductor was not in contact with the building, but was kept at a distance of $2\frac{1}{2}$in. by twenty-one insulators. The earth contact was obtained by bending the tube and burying it in the ground at a depth of from 6 to 18in., the soil being dry loose rubbish, the earth terminal being only 3ft. It was placed in a corner formed by a double-stem buttress, which came between the conductor and a lead-covered roof attached to the spire; the distance between the conductor and the lead roofing being about 6ft. 6in. The lightning appears to have come down the conductor a certain distance, and finding the road to earth bad, it passed through the buttress, dislodging about two cartloads of stone, and then down the cast-iron pipes leading from the lead-covered roof, and so to earth.

From the instances quoted, it is evident that it is not sufficient merely that rods of copper should be attached to a building, but it is necessary that once put up, they should be regularly inspected to see if they are in good order, so as to be really efficacious. That this is rarely done is one of the main reasons why accidents by lightning occur in places nominally protected by conductors. It is, perhaps, not too much to assert that at present not one in a thousand of our public buildings in England are regularly tested.

There can be no manner of doubt that in the matter of lightning conductors they manage things better on the other side of the Channel than with us. The French Govenment are in the constant habit of consulting the most eminent scientific men on the subject of protecting public buildings against the destructive influence of lightning. There is scarcely an instance in which a British Government ever did such a thing. It is true the Houses of Parliament had lightning conductors erected upon them at a very great cost and under scientific advice. But all who understand the subject practically agree in saying that it is very doubtful whether the magnificent pile of buildings in which our legislators assemble is really, that is efficiently, protected. At all events, I understand the earths have never been tested since the conductors were erected in 1852. That the Victoria Tower should have been struck in June, 1868, and slightly damaged, tends to show that the conductors at that time were not in an efficient state.

From the examination I have made I am pretty correct in stating that one-half of our cathedrals and three-fourths of our churches have not even nominal protection. For all that science has done, the Queen may any day be killed in her apartments in Windsor Castle, the Prince of Wales in Marlborough House, and the Prime Minister in Downing-street. To see the difference between England and France in this respect, one has but to cross the Channel between Dover and Calais. At Dover there are huge barracks of great length, on the top of high hills, exposed to the full fury of storms sweeping across the Channel, and the few conductors to be found upon them at long intervals are certainly not numerous enough for efficient protection against lightning, and their efficiency has never, so far as I can learn, been tested. The contrast in this respect on crossing the Channel is of the most striking. At Calais the Hotel de Ville, in the Grand Place, literally bristles with lightning conductors, and so all the churches and chief buildings in the town. The same all over France, Germany, and Belgium. Without slavishly imitating our scientific neighbours, we might yet bestow some of the care they do upon the protection of our property as well as of our lives against the terrible effects of the electric force.

MENTAL IMAGERY.

On Monday evening an address was delivered by Mr. Francis Galton, F.R.S., at Swansea, in connection with the meeting of the British Association on "Mental Imagery."

The author said:—

There is a true kinship between actual vision and the mental picture by which we recollect what we have seen. When light falls on the eye, a stimulus from without travels inwards towards the brain, where it associates itself with other waves of irritation proceeding from independent centres. In the formation of a mental picture the process is reversed. The action of the brain is propagated outwards, becoming fainter as it travels. The same nervous chain is concerned in both cases, but its links are differently affected. We may define Shakespeare's phrase of seeing with the "mind's eye" as a condition in which activity of the nervous centre bears a higher ratio to that of the nervous terminations than it does in ordinary vision. The object of the lecturer was to point out the chief peculiarities in the mental imagery of different persons to show that they were natural and hereditary, and characteristic of different races, but that they admitted in a high degree of being developed by education, and to describe the most useful peculiarities for technical and artistic use as well as for philosophical generalisations. The medium characteristic of mental imagery among Englishmen was fairly vivid, but incomplete. The field of their mental view was narrow, but by moving the mental eye from point to point the whole of the image could be successively seen, so far as it was remembered at all. He based these conclusions on hundreds of replies sent to an elaborate series of questions, of the substantial truth of which he was assured by frequent cross-examinations. He found that the power of seeing an image vividly was by no means uncommon, so it was *à priori* reasonable to expect that education might develop the power of the large majority to that high level. In actual proof of this he quoted the experiences of M. Lecoq de Boisbaudran (Enseignement Artistique, Morel et Cie., Paris), the late director of the Ecole Nationale de Dessein, in Paris, to show how well the visualising faculty could be taught. His pupils were made to study simple models carefully and then to draw them from memory, and in a few months they had no difficulty in summoning the required images, in holding them steadily, and in drawing them. A commission of the Institute, appointed in 1852 to inquire into the results, reported most highly in their favour. M. Legros, the present Slade Professor of Fine Arts at University College, was one of M. Boisbaudran's pupils. A description was given of many peculiarities of mental imagery, such as the strange and durable association in the minds of some persons with colours and letters or with days of the week, and the curious tendency of about one person in every thirty to visualise numerals in definite forms, which the lecturer recently described at the Anthropological Institute. These are examples of a want of flexibility in mental imagery that is characteristic of those who can with difficulty see an object mentally in more than one or two aspects. There are, for instance, many who cannot recall the faces of dear relations who have died, though those of persons who are indifferent to them are easily recollected. This is chiefly owing to their seeing familiar faces very often in many aspects, and to the memories confusing one another. Philosophers who deal in abstract ideas avoid concrete representations and suppress mental imagery, and often lose the visualising faculty by disuse. But those whose mental imagery can be educated so as not to be hard and persistent in its character, abandon a great deal of much value to them by the disuse of this power. They lose the only means they have of creating a mental generic picture under the conditions explained by the lecturer last year at the Royal Institution, and as illustrated by his plan of composite portraiture, of which he exhibited specimens. After giving details of various and not uncommon peculiarities, he stated as a not unattainable ideal by the majority that we should aim at the following result:—The power of calling up at will a clear and complete image of any object we have studied, and to be able to see it from any desired aspect, to construct clear images from description, and to alter them as we please; to create generic images from several different but somewhat similar elements, and to carry away pictures at a glance, more complicated than we could analyse at the moment of seeing them. The lecture was illustrated by specimens of the "visualised numerals," some simple, some shaded, and others coloured. He showed the practical application of his method of "statistics by inter-comparison" in obtaining median, quartile, octile, and sub-octile values for the vividness of mental imagery. He also exhibited specimens of aboriginal work by the bushmen of South Africa, from the fine collection of Mr. Stow, who has very lately sent some specimens to England, in hopes that means might be found for the publication of the whole of them. Also from Esquimaux and their kinsmen, the ancient cave-dwellers. All these testified, as he showed, to a race-peculiarity of mental imagery, which was probable enough, as the tendency to visualise clearly was a natural gift, and he had found it to be hereditary in an exceptionally high degree. From among the many evidences of the power of the Esquimaux to carry a mental image of a large extent of country, he exhibited a fac-simile of an aboriginal map, one of many contained in Hall's "Journals" published last year by the United States Government. It was the chart of a complicated coast line, extending nearly 1,000 nautical miles in a direct line, over which the man had canoed during his life, and it was drawn from memory alone. It might be compared to a chart of the south coast of England, the whole of those of France and Spain, and of the opposite shore of Italy. By the side of this was shown the Admiralty chart of 1874 of the same region, and the general coincidence between the two was striking. There was, to his knowledge, no instance among the many route maps compiled up to very recent years by travellers totally unprovided with instruments in Africa, Asia, and Australia, of any that were comparable in extent and accuracy to that of this barbarous Esquimaux. The visualising faculty was of importance in every trade and profession where design is required, because the workman ought to have a clear mental image of what he intends to do before he takes a tool in hand. The pleasure its use can afford is very great, many correspondents saying that the delight of recalling beautiful scenery and great works of art is the highest they know. A faculty that is of importance in all technical and artistic occupations, that gives accuracy to our perceptions and justness to our generalisations, is ignorantly starved by disuse instead of being cultivated in the way that will bring the best return.

THE DESTRUCTION OF ST. MARY'S, WHITECHAPEL.

THE calamitous fire which has reduced St. Mary's Church, Whitechapel, to a ruin, reminds us rather forcibly of the combustible nature of all our church-roofs of modern construction. It is instructive as indicating what might at any time happen to nine-tenths of our churches which have timber roofs, and which need only a light to set them in flames. Unfortunately, stone vaults are now rare, though even where they exist, as in most of our cathedrals, the wooden roofs above them are liable to be burned by carlessness of plumbers, as the late instance of Canterbury Cathedral affords us a lesson. But architects, for many reasons, prefer to employ timber, and to use close boarded vaults of wood, chiefly for the sake of economy and resonance. As far as we can gather from the facts at present brought to light, repairs were being made inside the structure, and a light is said to have been left burning in some part of the organ. In the momentary absence of the workmen, the organ is alleged to have become ignited, and the flames, ascending to the wooden roof, soon set it ablaze. Nothing would seem to be less probable than a lofty roof of a church becoming ignited; but the present is a deplorable instance of how readily the wooden casing of an organ may act as a connecting link to destroy a whole building. The roof in St. Mary's was lined with polished pitch-pine, which became a capital conductor of the flames. Dried both by the heat of the sun on the outer covering, and by the gas-lighting below, it was rendered in a fit state for immediate combustion, and the flames ran readily along, helped by the natural draught created, and attacked every point of the roof almost simultaneously. Referring to our description of this fine edifice, and to the view of the interior published in the Building News, Sept. 8, 1876, our readers will find minute particulars of its construction. It was rebuilt from the designs of Mr. Ernest Lee, at the expense of Mr. Coope, M.P., and completed in 1877. The nave was 110ft. in length, 38ft. wide, it was 51ft. high to the plate, and 65ft. the crown, and the roof was of king-post construction with ties, barrel-vaulted, and boarded with pitch-pine, ribbed, and left without stain or varnish. The eastern bay of nave on the north side was rather loftier than the others, and contained the organ, whose case was built in the recess. Nothing could have been more inflammable or have favoured the spreading of the flames better. Yet it is a type of many of our recently-built churches. Even pitch-pine is itself a highly resinous and inflammable material for roofs, and as an under lining with an open space over it, it seems almost to invite conflagration. The disaster is important as a lesson, and may suggest the question of how such roofs may be rendered less inflammable. An iron roof over a church will probably never become acceptable to the architect, neither can we say its advantages as a fire-resisting material give it any greater claim than it has æsthetically. Even wooden roofs may be made uninflammable or, at least, capable of checking the progress of fire. There are several excellent materials, such as plaster, some kinds of felt which resist combustion, and which might very easily be packed to a few inches in thickness behind the boarding of a vault. The danger is in leaving thin match-boarding with an open space above it to the mercy of ignition, which might just as readily have happened if a lighted match had been thrown down upon it by a workman engaged in repairing the timbers behind or the slating. But suppose that over the boarded vault another ceiling of rough plaster were introduced a few inches above. In this case the flames would at once have been arrested in their progress and time given to have averted a serious fire. Everyone knows that if a flame is prevented from rising, it is soon extinguished. Let the current of air be stopped by some incombustible material above the wood and close to it, and a sweeping fire is rendered impossible. A second plaster, or, better still, concrete, ceiling above the lower one would do this; and why cannot all our wooden timber roofs be so protected? It was the want of substance in the boards which facilitated the conflagration so disastrously. An open-timber roof, with open principals and boarding close to the slating, would not have fallen a prey to the flames half so easily, but the boarded ceiling, with its undoubted advantages, is unquestionably a source of peril. We, therefore, throw out the above suggestion in the hope that our church building societies may enforce a regulation in the way we propose. There are known certain chemical solutions which check inflammability; but such processes are as yet doubtful. Unfortunately, in church roofs, the risks cannot be reduced as in the case of dwelling houses and stores; there are no fire-proof partitions to confine a fire to one compartment, or iron shutters to let down to cut off communication.

As one of the best and most recent churches in London, the destruction of St. Mary's is to be deplored; the church itself was raised by private beneficence, and its architectural proportions and details were of the highest order and reflected credit upon its architect. The event may teach us that even so massive a structure as a church may be reduced in an incredibly short space of time by the ignition, through carelessness, of its almost sole combustible materials when those are disposed in a manner favourable for speedy destruction.

CISTERNS AND THE WATER SUPPLY.

IN his monthly report on the water supplied by the London Water Companies, Lieut-Col. Bolton says:—

In the absence of a duly authorised and official "standard of filtration" regulating the quantity of water to be passed through a given area in a given time, it has been found during the past 8 years that when the rate of filtration does not exceed 540 gallons per square yard of filter bed each 24 hours, the filtration is effectual, and this has been generally recognised as a tentative standard rate of filtration. The water companies now nearly all keep within this limit, but it is disheartening to reflect that, notwithstanding the efforts that have been made and the large expenditure that has been incurred in works for properly treating and improving the quality of the water, these efforts are rendered nearly abortive and but of little value by the apathy and carelessness of a great number of the householders. The water delivered for domestic purposes is frequently deteriorated after leaving the Companies' mains by the dirty state of the cisterns on the premises of the consumers. Many of the cisterns, tanks, and butts for containing water in small tenement houses in the Metropolis are in a disgusting and filthy state. An opportunity for inspecting these presents itself when travelling on some of the Metropolitan and suburban lines. Cisterns may be seen without lids and with portions of rotten lids floating in the water, fall of rank and decaying vegetation, and other most objectionable substances, such as old rags and paper, and on closer examination the contents would show more or less organic deposit, and under the microscope would be found to abound in infusorial life. All cisterns should, therefore, be properly covered and be frequently cleaned out and every care should be taken to prevent the contamination of the domestic supply after delivery. Now, as heretofore, it appears to be the rule in building a certain class of houses to place the cistern over the water-closet with an untrapped waste pipe communicating with the drains. These cisterns are often open and regularly receive the drippings from the roofs and gutters; they are moreover in close proximinity to the dust-bins and other deposits of filth and garbage, while children amuse themselves by throwing all sorts of dirty rubbish into the water, including dead puppies, and kittens, with an occasional cat. These are facts known by personal observation. The purest and best filtered water in England would be poisoned by such a system of sroreage.

The Public Health Act of 1875, section 70, gives power to any local authority, in case of complaint, to inspect and remedy such evils; but, probably, the only remedy for this state of affairs, will be found in the establishment of the constant supply system and the consequent total abolition of these unfit receptacles; meanwhile, and until the system of constant supply is completed, the owners and occupiers of houses are surely very wrong in permitting such a condition of things to exist. In the better class of houses and in many public buildings, the cleansing of cisterns and tanks is frequently neglected for months, and in some cases, years are permitted to pass without any examination or cleansing taxing place.

In courts and alleys several of the Water Companies are already giving constant supply by means of stand-pipes, provided, in most cases, with self-closing taps, and in the districts of those companies which are extening the constant supply, a marked improvement has taken place in the quality of the water consumed by the small householder, which thus reaches the house in the same condition as it leaves the Company's mains. In these monthly reports attention is periodically drawn to the necessity which exists for the regular cleansing of cisterns, and also to the fact that the contamination of water from the gases generated by sewage is of far more frequent occurence than is generally understood. Waste pipes from cisterns are still to be found in direct communication with the sewers, and the gases thus flow back into the cisterns and become absorbed by the water. To prevent this, the over-flow pipe should be brought outside the house and the end left exposed to the air, instead of being carried into the drain, as is often the case. By the adoption of this plan the poisonous effluvia and gases from the drains will be got rid of; these would otherwise ascend through the pipe and not only be partly absorbed by the water in the cistern, but be mixed with the air in the houses, thereby becoming a cause of danger and disease.

CHIPS.

The parish-church of Caldbeck was reopened on Sunday week after restoration of the chancel, from the designs of Mr. C. J. Ferguson, of Carlisle. In removing the ceiling of sacristy, a 4-light clerestory window of about the period of the rebuilding of sacristy and insertion of present east window to chancel—1512—was found and opened out, and also three less important windows, previously blocked up. The cost has been £600, and the chief contractors were Messrs. W. and J. Batey, of Upperley, for masonry, Mr. Foster, of Wigton, for joinery, and Messrs. Stockdale and Johnston, of Carlisle, for plumbing. It is proposed to restore and reseat the nave from the designs of the same architect.

A new chapel, to be known as the Vineyard, has just been opened in Norfolk-street, Peckham. It has been built by the preacher, Mr. Frederick Seiler, builder and manufacturer, of East Dulwich, at a cost, including furniture, of £4,500, and seats 500 persons; at the rear is a second hall, separated by folding doors, and seating 200 persons. The organ in the chapel is by Messrs. Bevington and Sons.

The Newmarket Local Board of Health discussed on Monday week the differences which have arisen between Messrs. Saint and Son, the contractors, Mr. J. F. Clark, the engineer, and the board, as to the terms of the contract for bricking the sewerage area, and resolved to call in Mr. Edward Pritchard, C.E., of London and Warwick, to act as arbitrator.

A mural painting representing the Nativity has been placed over the chancel-arch of Prittlewell parish-church, South Essex. The painting is the work of Messrs. Buckley and Co., of Wells-street, London, W.

The corporation of Colchester decided to acquire land of Mr. T. Moy, for the purpose of a sewage outfall, and also accepted the lowest tender, that of Mr. R. C. Trimm, at £36,720, for the execution of sewerage works. The work will be carried out from the plans and under the supervision of Mr. Clegg, the borough surveyor.

A new church, in course of erection at Langho, at a cost of £4,000, will be opened by the Bishop of Manchester on the 25th inst.

The town council of Preston, on Thursday week, adopted plans by Mr. Garlick, their surveyor, for alterations to the floor of the Guildhall, and for improvements at the corn-exchange.

A freehold plot of ground in Budge-row, Cannon-street, with a frontage to the street of 18ft. 6in., and containing about 870 square feet (with an old house on it, shortly coming down), was sold by auction last week, at the Mart, by Messrs. Foster, of Pall-mall, for £6,500—equal to £7 10s. a square foot, or at the rate of over £326,000 per acre.

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ILLUSTRATIONS.

THE COLLEGIATE CHURCH OF ST. MICHAEL AT ST. QUENTIN. — STUDIOS, PARK-ROAD, HAMPSTEAD. — HOUSES, LORNA-ROAD, HOVE, BRIGHTON. — BOXMOOR SCHOOLS, HEMEL HEMPSTED.—VILLA RESIDENCE AT BLACKBURN.

OUR LITHOGRAPHIC ILLUSTRATIONS

THE COLLEGIATE CHURCH OF ST. MICHAEL AT ST QUENTIN.

In approaching the town of St. Quentin by railway, the most striking object is the Church of St. Michael, a view of which, from the south-east, which was exhibited at the Royal Academy, we give as one of our lithographic illustrations. The church is situated at the end of the Rue St André, which leads eastward from the Grande-place. The west front has been removed, and one of Renaissance character substituted; but the transepts and apse are tolerably perfect. The internal height of the vaulting is 130ft., and the clerestory windows are about 40ft. in height; those in the apse have still the original glass in them. The great feature of the east end is the arrangement of the columns between the aisle and the chapels surrounding the apse. Instead of a single opening to each chapel, there is an arcade of three arches, the centre one being wider than the others; the columns are so placed that they form a flat apse to each bay of the aisle. The columns of the choir arcade have elaborately-carved capitals, which have a second band of foliage surrounding the shaft below the necking. The crypt contains the tombs of St. Quentin and others. There is a fifteenth-century hotel de ville, and much that is worth sketching in the different streets.

STUDIOS AT HAMPSTEAD.

This building has been erected in the Park-road, Haverstock Hill, with a view to meet the greatly-increasing demand for spacious, well-lighted studios in this neighbourhood. Each studio is about 25ft. 6in. by 20ft., and 18ft. high, with dressing-room and bedroom adjoining. The building is faced with red brick, and the roofs covered with green slates. The treatment is bold and effective. The architect is Mr. Theodore K. Green, of Finsbury-place, E.C.

HOUSES, LORNA-ROAD, BRIGHTON.

The necessity of making these houses commercially successful compelled the architect to avoid all quaint conceits and picturesque oddities; however, by the introduction of colour and patterns in the cement-work, a little life is given to the design, and the usual objectionable appearance of cement-fronted houses is avoided. The walls are built solid, but those facing south and west are battened internally. Hot and cold-water services are laid on to each house. Special attention has been given to the lighting and ventilation of the staircases. The rentals are from about £50 to £60 per annum. Mr. J. G. Sheldon, of Cliftonville, Brighton, is the builder, and the architect is Mr. W. Galsworthy Davie.

BOXMOOR SCHOOLS.

The Boxmoor Schools, built at Two Waters, for the Hemel Hempsted School-Board, are situated on a narrow-fronted site of steeply-sloping ground facing the open common, about half a mile from the railway-station, and some distance to the right on the road from the station to the town of Hemel Hempsted. They are built to accommodate 120 children in the mixed school and class-rooms, and 100 infants, of course, having separate entrances, with the necessary cloak-rooms, lavatories, &c., and good playgrounds. There is a master's house in the front, with large sitting-room, kitchen, scullery, pantries, &c., and three bedrooms over. The buildings were satisfactorily carried out by the late Mr. Joseph Harris, builder, of Great Berkhampsted, from plans prepared by and under the personal superintendence of Mr. John Ladds, architect, who won them in competition. The buildings are faced with Cowley stock bricks, and have red brick bands and arches, with hard stone sill and steps; the roofs are open-timbered, ceiled to the under side of the rafters, and are covered on the outside with plain tiles from the yard of Mr. Franklin, Ampthill, Beds.

VILLA RESIDENCE AT BLACKBURN.

We have received no particulars descriptive of this villa residence at Blackburn, of which we are enabled to give a plan and view of the entrance-front to-day. The materials are stone, with coloured bands for the walls, and slates for the roofs. Tinted quarry glazing is to be introduced in the upper lights of all the principal windows. Messrs. Waugh and Isitt, of Bradford, are the architects.

THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Mr. CHARLES BARRY'S report on the designs submitted for the erection of the proposed new municipal buildings at Glasgow was presented to the Town Council yesterday. Mr. Barry recommends the award of the first premium of 750 guineas to "Carton"—Mr. George Corson, of 25, Cookridge-street, Leeds; the second, of 500 guineas, to "Fidelity"—Messrs. Coe and Robinson, of 4, Furnival's-inn, London, E.C.; and the third, of 300 guineas, to "Let Glasgow Flourish for Ever"—Mr. Edward Clarke, 6, Adam-street, Adelphi, W.C.

TEMPERATURE OF TOWN WATER SUPPLIES.

At the British Association meeting on Monday a paper was read on "Temperature of Town Water Supplies," by Mr. Baldwin Latham, C.E., M.Inst.C.E. The author pointed out that summer diarrhœa and cholera became prevalent when the water supply of a district arrived at a temperature exceeding 62deg. Fahrenheit, and he showed that the changes which took place in water at a high temperature influenced the diseases referred to, and not atmospheric changes. In corboration of this he referred to districts in which the water was invariably cold in summer and which consequently were not subject to those epidemics. In districts where the source of supply, when distributed through the mains, was from a well which was naturally cold—as, for example, in the district supplied by the Kent Water Works Company, compared with the districts in London supplied from the river Thames, the former source of supply being so much colder at its source than the latter, the ground required a higher degree of temperature to raise that of the Kent water to a dangerous point, and thus the incidence of the disease in the districts supplied with that water fell later than in those supplied with Thames water; whereas if the cause were due to atmosphere temperature the incidence of the disease should have been identical in both districts. The author further pointed out that great changes in the temperature of water were due to the temperature of the ground at the depths at which the mains were laid; that the temperature of the ground might be made use of in a special apparatus patented by Professor J. T. Way and the author, by which water was made to descend to a depth of about 25ft. by means of a vertical tube driven or screwed into the ground, so that the temperature of the water was rendered nearly uniform throughout the year. A greater range than 3deg. would not practically occur in such a tube; whereas in Croydon, where there was a constant water supply, the range in the temperature had been 27·6deg., and a cistern supply gave a range of 38·7deg. By keeping the temperature of the water between the limits of 49deg. and 52deg. through the apparatus referred to, it was explained that summer diarrhœa could, in a great measure, be prevented.

In the course of the discussion which followed, Mr. R. Grantham, C.E., said that the subject was a very important one, and engineers might learn from it that it was desirable to place water mains at greater depths than was now the practice. The President of the Mechanical section said the subject of water supply was one of great importance, and bore testimony to the experience of the author and the importance of the subject. A vote of thanks was accorded to the author of the paper.

CHIPS.

A new church in Wellington-square, Minehead, built at a cost of between £4,000 and £5,000, was consecrated on Thursday week. It is in the Decorated style, and consists of chancel, vestry with organ-chamber over, nave with north and south aisles, and bell-turret. It is dedicated to St. Andrew, and seats 324 worshippers; the architect was Mr. G. E. Street, R.A.

The corn exchange at Chelmsford is being altered, to render it more suitable for concerts and entertainments, and is being extended at the rear by the erection of a new basement for seat-storage, over which are retiring-room, an office, and committee-room. The works are being executed from the designs of the original architect, Mr. Chancellor, of London, and will involve an expenditure of about £1,100.

The chapel-of-ease of St. Peter, Mansergh, in the parish of Kirkby Lonsdale, was opened on Thursday, the 26th ult., after having been rebuilt on the old site. It consists of nave, chancel, north transept, and vestry and west tower. The walling materials are native limestone and dressed freestone, the seating is of pitch-pine, and the pulpit of oak. Messrs. Paley and Austin, of Lancaster, were the architects, and the chief contractors were: for masonry, Messrs. Atkinson, Kirkby Lonsdale; carpentery, Messrs. W. Huck and Sons, Endmoor; plumbing, Mr. Moorhouse, Kirkby Lonsdale; and slating, Mr. Pyecock, Leeds. The church seats 180 people, and has cost about £2,000.

Beeley Church, on the road between Rowsley and Chatsworth, is about to be restored and partially rebuilt in the Decorated style, from the designs of Mr. H. Cockbain, architect, of Middleton, near Manchester. The proposed outlay is about £2,000.

A new Catholic school-chapel has just been completed at South Shore, Blackpool, which has cost about £500. It is 84ft. long, 22ft. wide, and 14ft. to wall-plate, and will accommodate about 200 worshippers; it is simple in design, and is built of brick and stone. The architect has been Mr. Robert B. Mather, Blackpool.

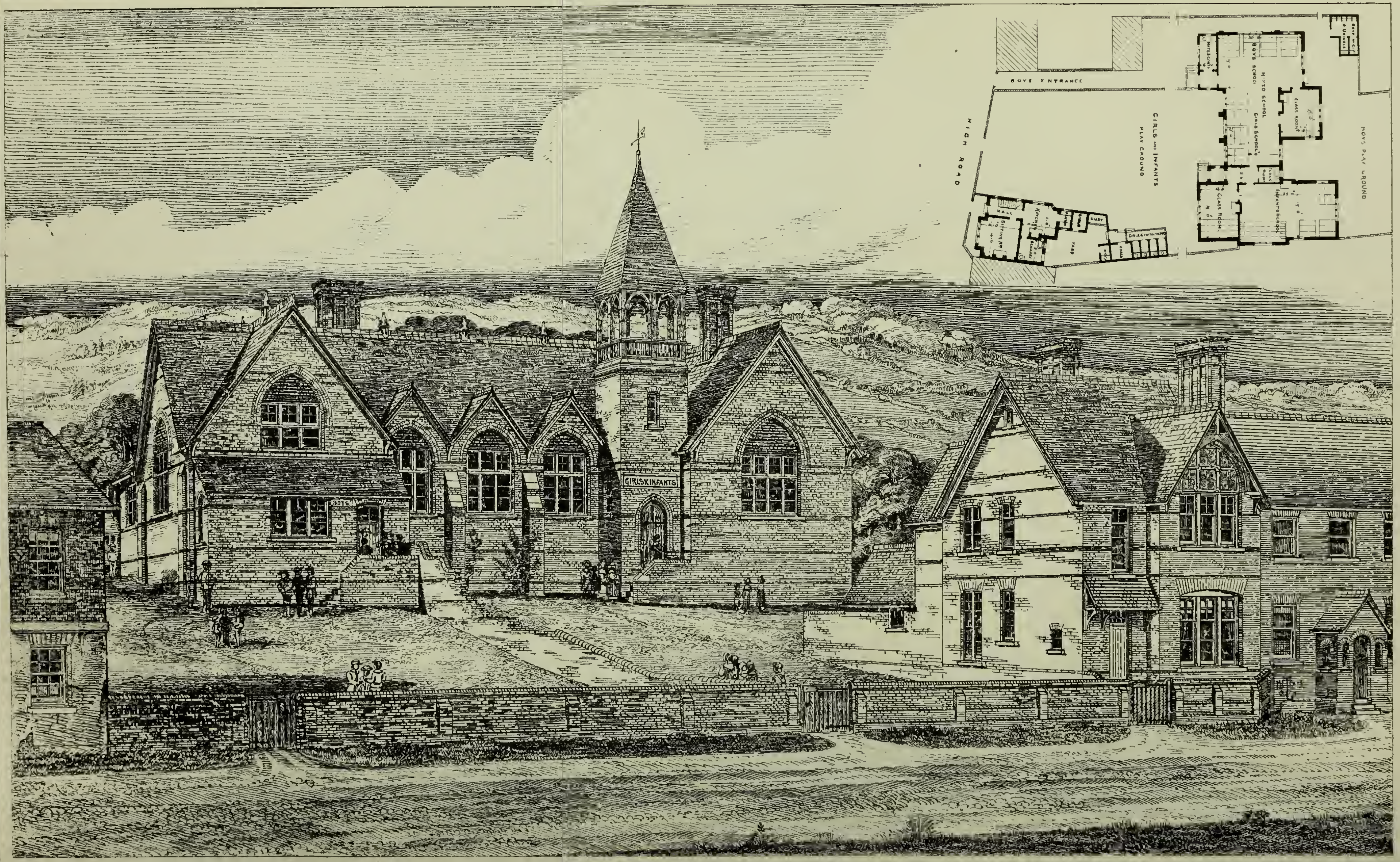
The foundation-stone of a new Primitive Methodist Chapel was laid at Howdon, near Newcastle-on-Tyne, on Saturday. The building is designed in Gothic of the Early English period. The contractor is Mr. Jacob Atkinson, of Gateshead. The designs have been prepared by Mr. Thomas Southron, architect, of South Shields.

The small parish-church of St. Beuno, Llanycil, was reopened last week after restoration. The south wall and north porch have been rebuilt, new pitch-pine roof erected, new traceried windows of Late Decorated character placed in the walls, and new oak pulpit desk and seats and other fittings provided. Mr. W. H. Spaull, of Oswestry, was the architect, and Messrs. R. and R. Roberts, of Bala, were the builders.

An inquiry was held on Thursday week, at Guildford, before Mr. Robert Rawlinson, C.B., the senior inspector of the Local Government Board, respecting an application from the town council for permission to borrow £2,000 for works of street-improvement. The inspector said the board could not grant money for current repairs, such as some of the proposed works, and for the tar paving only a very short term of repayment could be permitted.

A new organ, built by Messrs. Browne and Son, Dublin, was dedicated on the 26th ult. in the Protestant Cathedral of St. Lazerian, Leighlin.

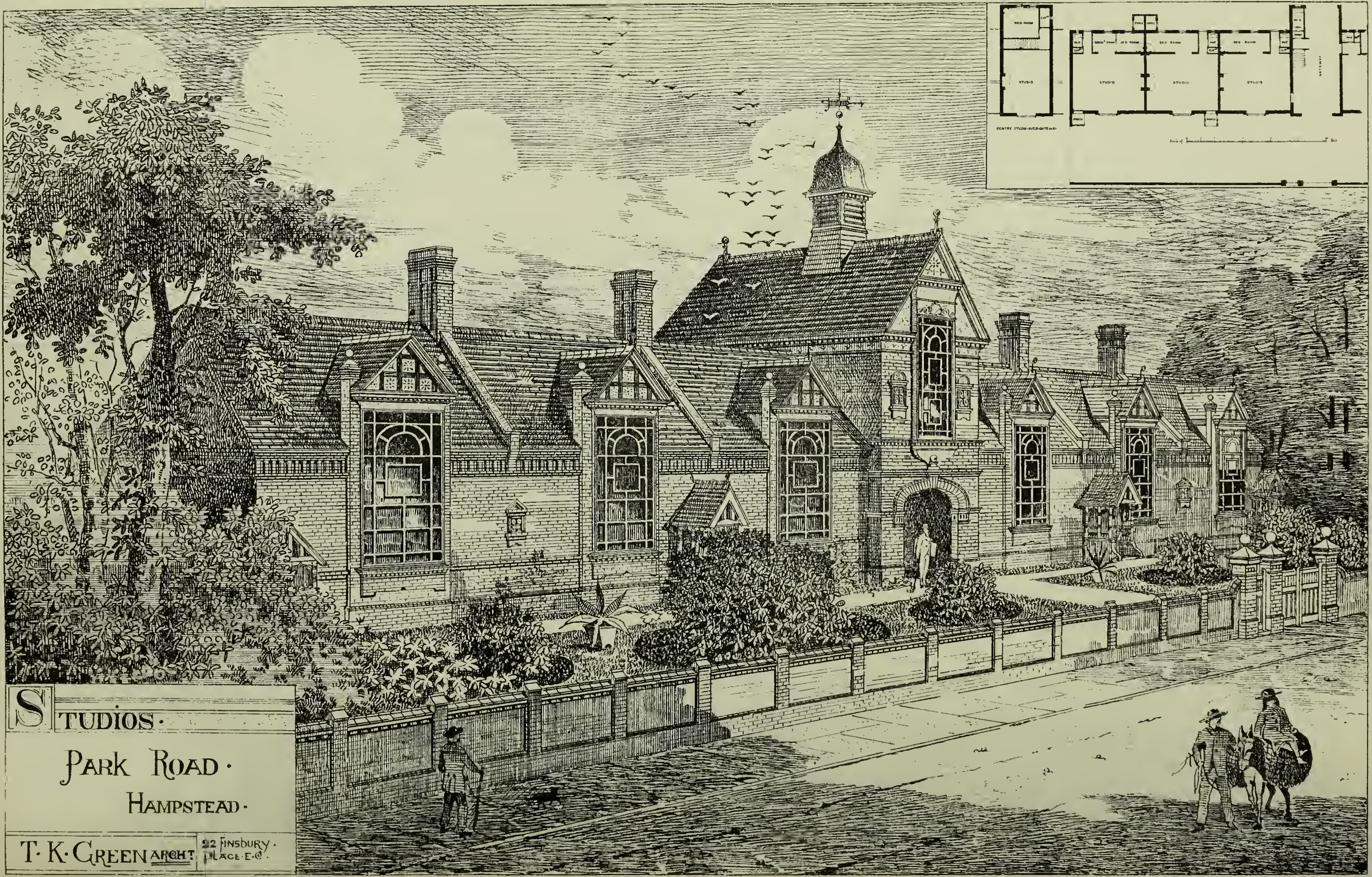
The Maidstone Gas Company have voted Mr. John West, their late engineer and manager, £500, in recognition of his extra services as engineer and architect during the reconstruction of the works.



BOXMOOR · SCHOOLS · HEMELHEMPSTED · HERTS ·

Jno. Ladds, Archt., 4, Chapel St, Bedford Row, W.C.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



STUDIOS·
PARK ROAD·
HAMPSTEAD·
T·K·GREEN ARCHT 22 FINSBURY· PLACE·E·C·

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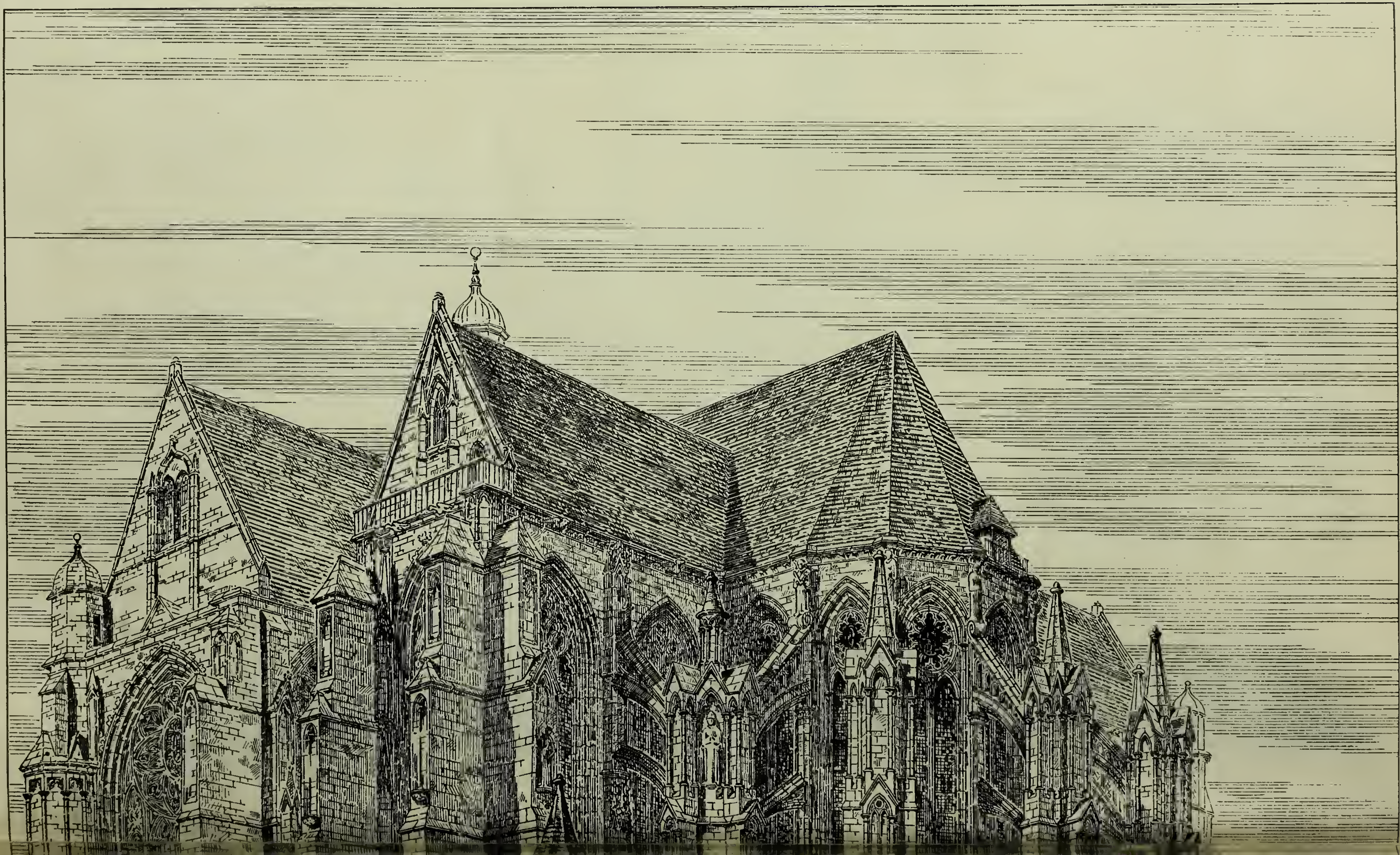

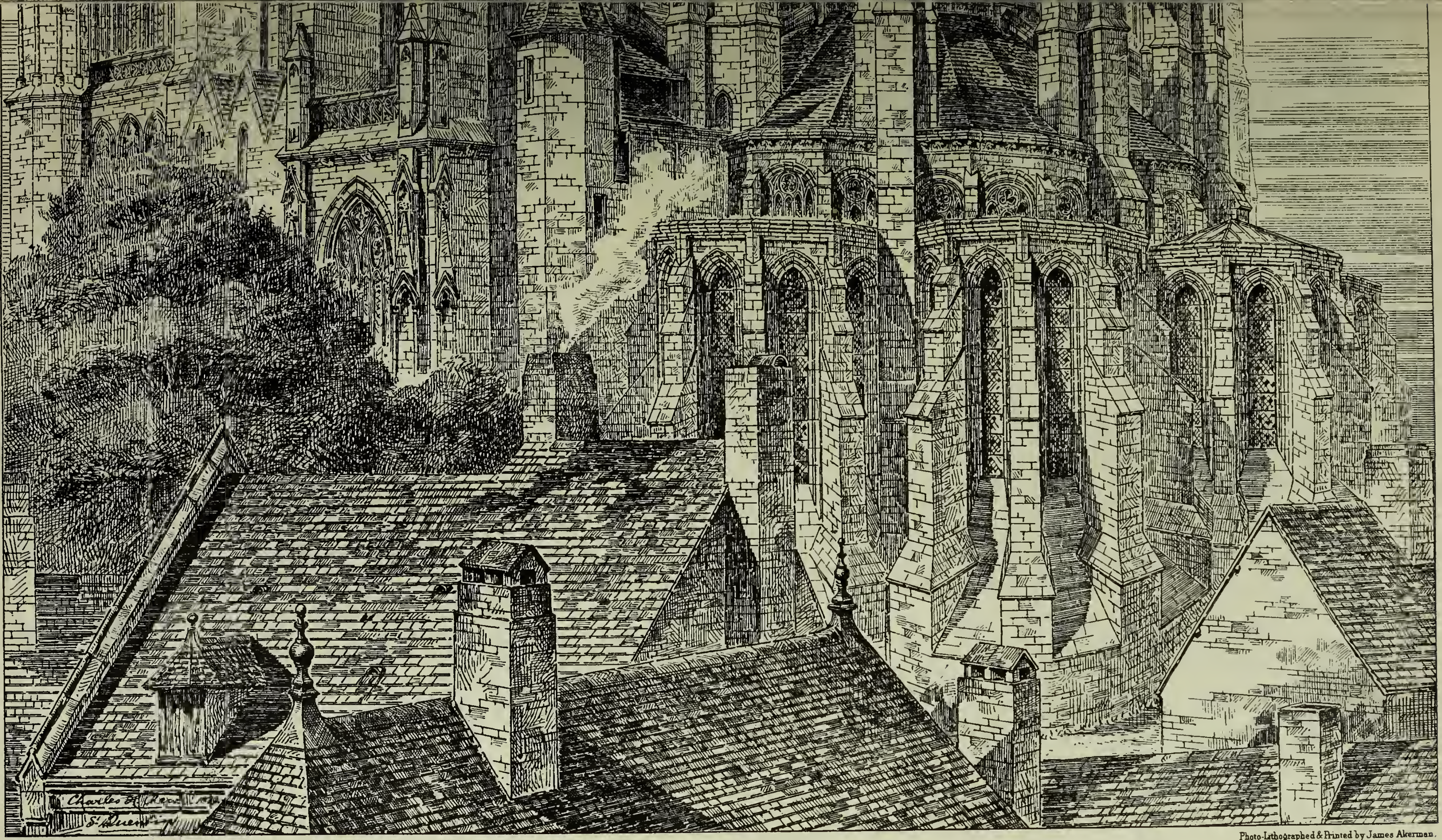

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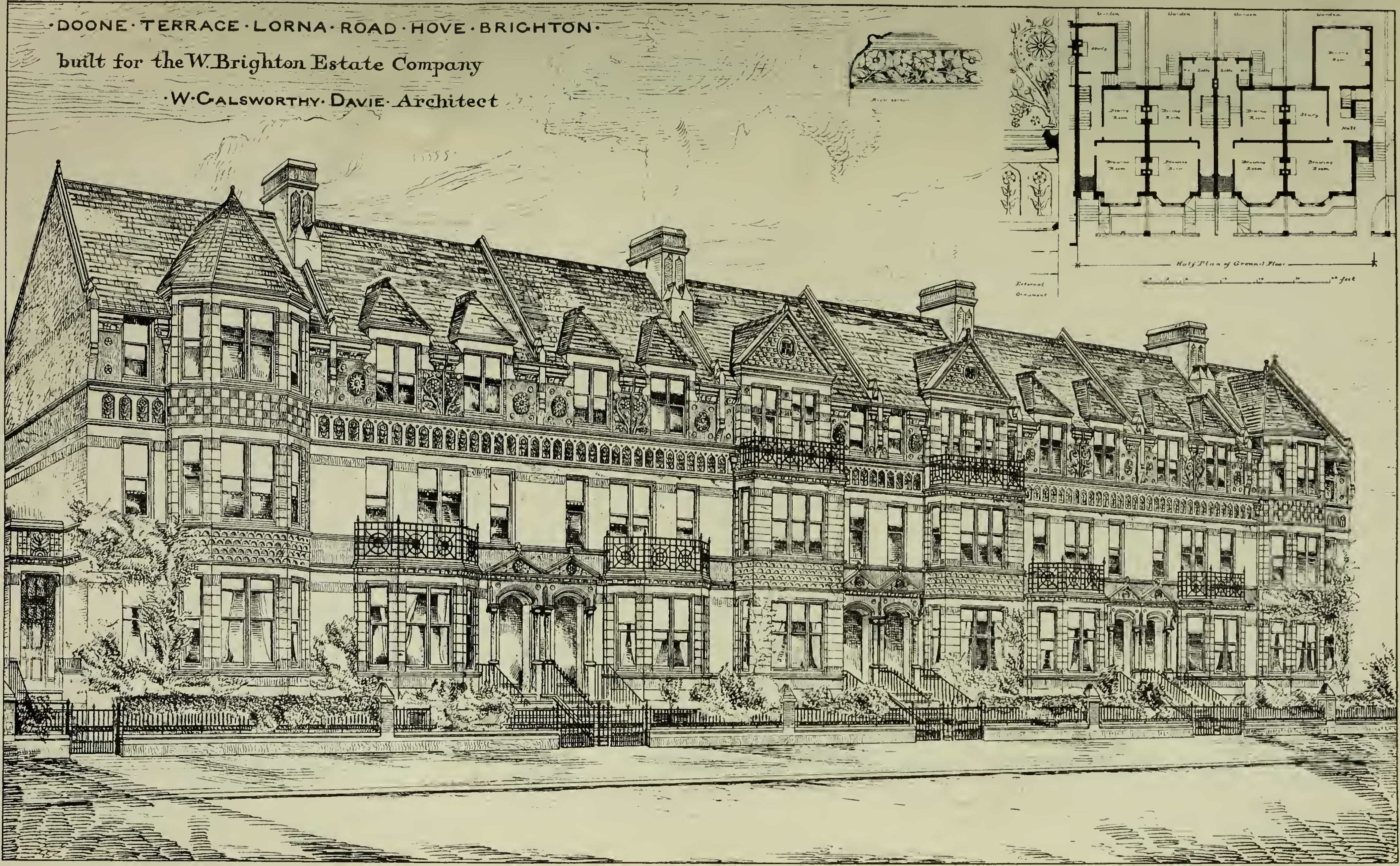
The Collegiate Church of S·Michael at S·Quentin *drawn by* C·H·Rew· *architect*·

·DOONE·TERRACE·LORNA·ROAD·HOVE·BRIGHTON·

built for the W. Brighton Estate Company

·W·GALSWORTHY·DAVIE·Architect



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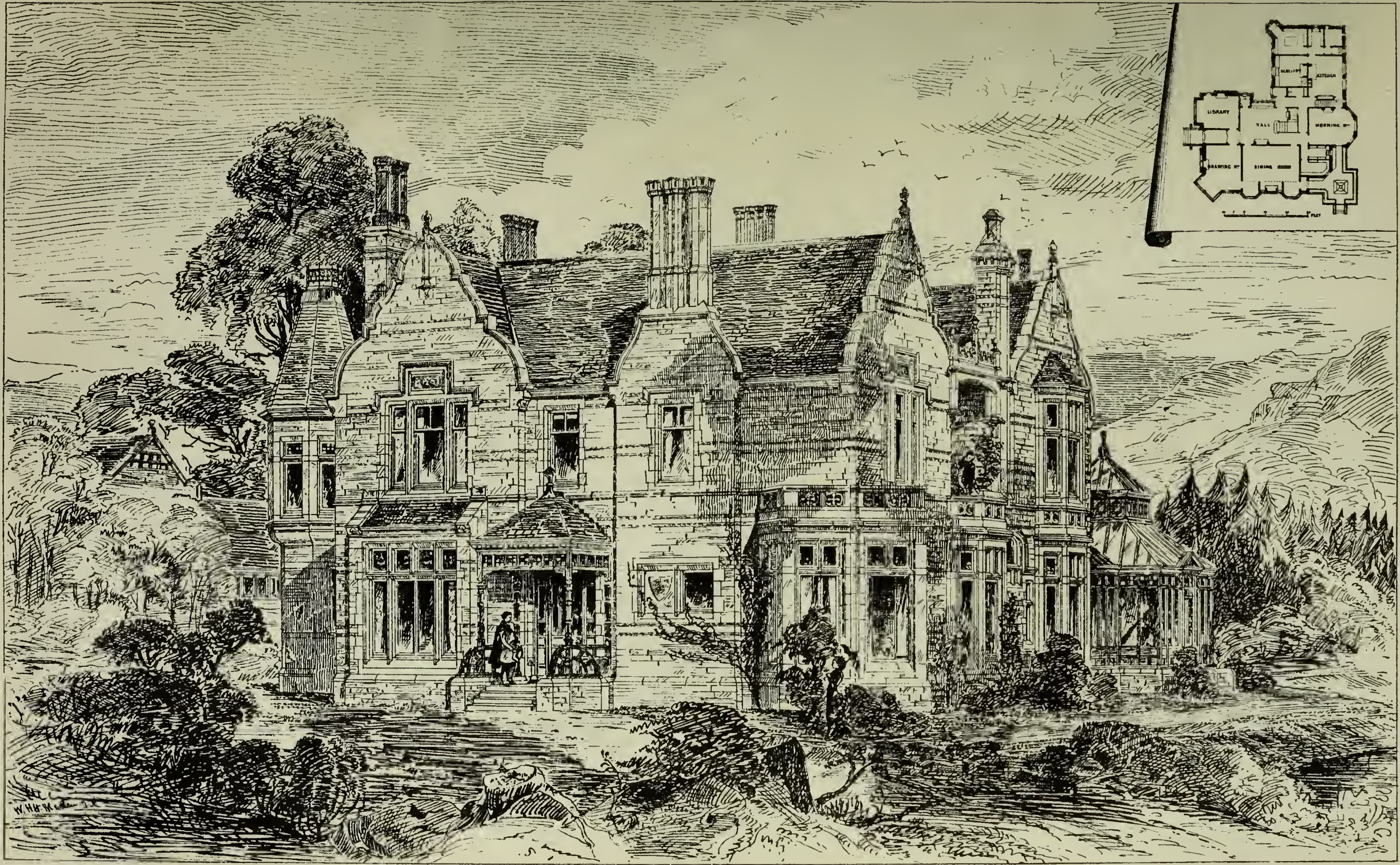

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VILLA RESIDENCE AT BLACKBURN

WAUGH AND ISITT – ARCHTS – BRADFORD

THE PROGRESS OF IRELAND.

ALTHOUGH I learn from your columns that the steps of searchers for the architectral picturesque have this year been turned towards the Netherlands—with what success we shall no doubt be informed—my own have been directed towards a different quarter, and one that seldom attracts the notice of writers in art journals. I have lately returned from a short tour in Ireland, from which I have derived great and unexpected pleasure, and as "equal justice to all round" ought to be the motto of every lover of the fine arts, I propose communicating a few of the principal matters of interest I observed.

The main result of the tour was to leave on my mind an impression of surprise, mixed with sundry other feelings, that a country which is often regarded by Englishmen as notable for little else than poverty, wretchedness, ignorance, crime, and general barbarism, should be topping the larger island in Gothic architecture, church-building, and whatsoever belongs to them. It is clear that one set of men are little at a loss for the money they require to carry out their projects in this line, and that is the clergy. The Roman Catholic priests have not fallen off a whit from their ancient skill in holding the purse-strings, and the clergy of other denominations are little, if at all, behind them.

Derry was the first remarkable town I visited, a place which now covers a fine amphitheatre of hilly ground rising above the ample waters of the Foyle. The great novelty here is the Roman Catholic Cathedral, a vast edifice in the First Pointed style, bearing much general resemblance to some of Sir Gilbert Scott's latter churches, but much larger. The nave is of seven bays, the arches resting on octagonal columns, with plainly moulded capitals, and in the sanctuary and side-chapels there is the never-failing accompaniment of rich sculpture, subjects chiefly taken from the Gospels. The height internally is about ninety feet, and the materials are Irish lime-stone, granite, and marble. The episcopal residence adjoining is in a medium style, so as to harmonise well with the massive and simple character of the church.

The sites of all the principal Irish towns, (excepting only Belfast), are so strikingly beautiful, that one might suppose them to have been selected with an eye mainly to picturesque effect. Armagh was my next point, and here I found ample matter for wonderment, not only in the old cathedral, admirably restored some years back under the auspices of the late Protestant archbishop, Lord John Beresford, but in the modern Roman Catholic Cathedral which occupies an adjoining hill, a much larger and more magnificent edifice of the Second Pointed style, the fruit of thirty years' labour in building. I did not learn its exact dimensions, but there can be no doubt of its being the largest church built in the three kingdoms since St. Paul's of London. With its two towers and spires flanking a richly decorated frontal, it now forms the principal ornament of the town. A fine church in the same style of architecture, which the Armaghites call the Presbyterian Cathedral, has been erected within the last three years in a wooded valley at the foot of the two hills on which Armagh stands.

Sligo was my next object, a neat town built in rustic and homely but pleasing style on a broad and swift stream issuing from Loch Gill, and crossed by a curious old bridge of nine arches. Here interest is engrossed by the grand church which is the cathedral of the Roman Catholic diocese of Elphin. It is in the Romanesque or Byzantine style, and the admirable finish of every detail, both outside and inside, with the consistent adherence to all its requirements of the style observable throughout, leave on the mind an impression entire and unbroken, such as is derivable from comparatively few works of architecture. It is inferior in size alone to Speier (or Spires), and with a perfect recollection of the basilica of St. Boniface at Munich, I do not hesitate to pronounce the church of Sligo by far the finest modern specimen of the style which has been raised in Europe. The dimensions as given to me are—length internally 240 feet, length of transepts, 180 feet, breadth, 84 feet, reduced height to wall-plate, 85. The nave has five bays, from one of which the size of the arches may be deduced. A square tower of great strength and solidity contains a chime of nine bells cast by Murphy, of Dublin, the tenor of which weighs 37 cwt. They are remarkable for the rich harmony and sweetness of their tones. The opinion here expressed as to the church, I was told, is substantially the same with that of all or most tourists who have visited it, yet I cannot recollect having ever seen it noticed.

In Dublin I need not say that I examined with keen interest the restored fabric of Christ Church, which in its new condition reflects so high honour on Mr. Street. This and the old cathedral of Armagh, are the two most perfect examples of restoration works which I have met with in our own territories. My eyes, however, were not exclusively directed to ecclesiastical buildings, and I was almost equally gratified with the new market-houses now being constructed at the end of Wicklow-street, from the design of Mr. Mawson ,of Bradford. They are after the best pattern of Flemish Gothic, as found in the Town Hall of Brussels, but with details carefully selected and elaborate, such as can be found in few of the old edifices of the Low Countries. The material is fine red brick with white stone facings.

Both at Limerick and Killarney Mediæval enthusiasts will find much to reward their inspection in the churches built from the designs of the elder Pugin. The last points of my journey were Cork and Queenstown. I have before now given expression to my admiration for the cathedral of St. Finbar, designed by Mr. Burges, which I could see a hundred times without being satisfied. No Scotchman could do so without a feeling of bitter regret that the design for the Edinburgh Cathedral should have fallen into hands which produced a result so much inferior. The grand cathedral of Queenstown, for the Roman Catholic diocese of Cloyne, from the designs of Mr. Ashlin, of Dublin, approaches completion, and, planted on its commanding eminence, will form a sea-mark worthy of the Cove of Cork. In dimensions it appears to be the rival of Armagh, but I trust the architect himself may be induced to furnish a correct and complete account. The style is a pure example of Decorated Gothic; this, and the Presbyterian Church in Rutland-square, Dublin, erected at the expense of Mr. Findlater, with the Roman Catholic basilica of Arundel, and the Keble College at Oxford, afford the only real examples of Decorated Gothic which have been attempted of late years by English or Irish architects. We have indeed examples of plain Second Pointed, and of the Debased Perpendicular to which some infatuated men of merely English tastes cling with despairing fondness; but where else than in the instances I have named can we look for flying buttresses, gableted windows, pinnacles, and gurgoyles, finished with due richness of detail, such as bring back to our insular fancies the glories of Cologne, Amiens, and St. Gudule at Brussels?

VITRUVIUS CALEDONIUS.

OUR COMMONPLACE COLUMN.

NOTES ON NORMAN FONTS.

NORMAN fonts are of various forms—circular, square, or polygonal; generally rudely and intricately carved, with massive bases or supported on pillars. Good examples are found at Winchester Cathedral, St. Michael's Church, Southampton, East Meon, Hampshire, St. Peter's, Ipswich, and in many of the churches in Sussex. Three of these fonts are of black marble, the bowls are square, resting on a centre pillar with four angle shafts. They are supposed to have been the work of the same hand. See illustrations of fonts in the BUILDING NEWS. Apropos of fonts, Sir Edmund Beckett suggests that when there is no tower door the tower makes a capital baptistry. He instances a large font of dark marble at St. Mary's, Beverley, as a particularly fine one, though not generally known.

NORMAN ROOFS.

THESE are generally of square pitch, sometimes higher, open to the frame timbers, of king-post construction, or framed with a tie-beam, a collar, angle ties, and upright ashlar timbers resting upon an inner wall-plate. Sometimes they were cross-framed. In Peterborough Cathedral the roof is boarded on the under side, so as to form a flat or slightly canted ceiling, and such were often decorated with colour. The writer in the new edition of the "Encyclopædia Britannica" says:—"At Adel, near Leeds, are remains of a richly-moulded Norman roof, in which every pair of rafters seems to have been furnished with a tie-beam. But it need hardly be said that not many wooden roofs of this period exist, and the stone roofs which as time wore on were more often erected, were not only more permanent, but no doubt played the most important part in the gradual development of the style, and the introduction of the pointed arch."

NORTH SIDE OF CHURCH.

THE north side of a church has a traditional meaning, of a rather superstitious kind, attached to it. It was regarded as the haunt of Satan and source of the cold wind. In Walcott's "Sacred Archæology," the curious reader will find many interesting stories. At Wellcombe Church, near Morvenstow, there is what is called the Devil's Door, adjoining the font, which was only opened when the renunciation of the devil, &c., was made in baptism, for the escape of the fiend. In other Cornish and Welsh churches we find the same superstitious ideas have existed, and in consequence the northern side of churchyards are often without graves. The north door has also been called the "bachelor's door," owing, no doubt, to the separation of the sexes that was practised, for we find the north and south doors placed opposite to each other in many old churches.—The "Maitland Club," "Chronicles of Perth," 4to Edin. 1831, record 19th May, 1582, that a woman was "ordained to be put in the ward of the fornicators, above the north kirk door." ("Arch. Dict.")

NORWEGIAN ARCHITECTURE.

THE churches of Norway, with the exception of the cathedral of Throndhjem and a few others of stone, are all of timber. The characteristics of the Norwegian timber churches are plans in the form of a cross, with a centre roof from which springs a cupola or spire; the roofs are high-pitched, and the outline of these erections have generally a pyramidal form. The walls and roofs are often covered with scale-shaped shingles. The "Arch. Dict." says the "details are elaborate; rounded apses to the chancels; transepts, chapels, and porches, exterior cloistered galleries, lofty spires or cupolas, all richly ornamented with encircled crosses on the gables, and dragons' heads carved in bold relief projecting from the angles, break the general outline with all that picturesque variety which is peculiar to Gothic architecture. They are often painted of a rich brown colour, resembling chestnut or dark oak; sometimes of a bright red. Some of the oldest of these churches date back to the 11th or 12th century." An example of a Norwegian church was illustrated in the BUILDING NEWS, Vol. XXXVII. p. 278. It is the church at Hitterdal, in the Tellemarken, one of the largest examples; it is square, 84ft. by 57ft., and was restored, in 1850, by Nebelong. We have also illustrated the similar church at Borgund. Many of these structures are no doubt imitations of stone buildings, and they show the durability of the pine of Norway. They are also very interesting as showing the skill of Norwegian artists in wood. The church at Moster, in South Bergenhus Ampt, is supposed to be the oldest in Norway, and to have been built by Olaf Tryggvason, in 996, in the spot where he had ordered Mass to be said on his arrival from England. Some of these buildings show English workmanship. We refer to the "Arch. Dict.," paper by Mr. Fergusson, published in sessional papers of R.I.B.A., 1850-51; "Von Buck's Travels," 1813; Sköldberg's "Beskrifning," 1846. See also descriptions relating to exportation of timber houses from Christiania, in the BUILDING NEWS, Vols. XXV., XXVI., 172, 214, &c., paper by F. E. Thicke. Irish crosses are also found; see one in view of church at Hitterdal before mentioned, given in the BUILDING NEWS, and the reader is referred to a letter in the same volume, p. 358.

NORFOLK ROUND TOWERS.

THESE towers are generally about three diameters in height, and are placed at the west end of the churches. Being built of the local materials, in a country where freestone is rather scarce, it has been somewhat reasonably imagined that their builders adopted the form to dispense with worked quoins at the angles. My opinion is that the circular form was adopted for other reasons, and the quoin theory is upset by other instances of the same age. There is no western door, but they are usually open to the church by an arch. The late Mr.

G. Roberts assigns their date to from 1100 to 1150 a. d. In later examples an octagon upper stage surmounted the circular, and was a mark of the transition to the square (see paper by Mr. E. P. Loftus Brock, F.S.A., Building News, Vol. XXXVII, pp. 274 and 386, where that gentleman shows that they were erected in Saxon times). G. H. G.

NOTE OF A ROOM.

Every room has a note of its own that is at once recognised by a musical ear; and every speaker should find out what this note is, so as to speak in it. Little is to be found on this subject—though those who have studied the acoustics of buildings are well aware of the importance of the subject and its bearing upon the improvement of sound. The "note of a room" seems hardly to be justly defined to be caused by the vibrations of a column of air giving musical sounds; we may more correctly define it to be a natural resonance or reverberation of a harmonic character, created by the form and reflecting surfaces. There is no doubt that the note of a room may be altered greatly by altering the nature of its walls, substituting a resonant for a deadening material like stone, or plaster, &c. It is the reponse to a vibration set up by the sound, a sonorous agitation excited by it, that causes the note. The subject has been referred to by Mr. T. Roger Smith in his little treatise on "Acoustics" (Lockwood and Co). Recently the introduction of wires for improving sound, by Mr. Engert, of the City-road, may be mentioned as indicating how the note of a room may be attuned to the voice. The wires are fixed longitudinally above the auditory and are stretched to a degree of tension that takes up the vibrations of sound and conducts it over the room. By this means it is possible to modify the key-note. (See recent articles in Building News.)

NUMISMATICS.

Among the best works on this subject, the reader is referred to Hennin, "Manuel de Numismatique Ancienne" (Paris, 1830); Grosset, "Handbuch der alten Numismatik" (Leipsic, 1853); Leake, "Numismatica Hellenica" (London, 1854); Ruding's "Annals of the Coinage of Great Britain" (1840); Lindsay's "View of Coinage of Scotland" (Cork, 1854). See also a manual in Bohn's Series and articles in "Encyc. Britannica."

NURAGHE.

Certain structures, of conical shape, in the Island of Sardinia, rising 30 or 40ft. above the ground. They contain two or three domed stories, or chambers, connected by a spiral stair. Some are raised on basements of masonry, or platforms of earth; they are made of granite, limestone, basalt, porphyry, sandstone, and schist. Their entrances are small and low. Masonry is irregular, but not polygonal, and resembles Asiatic work. Their origin is obscure, and have many points of resemblance to the "burghs," or duns, on the northern shores of Scotland. Skeletons, and funeral paraphernalia, have been found in them. (See art. and engravings in "Chambers's Encyclopædia.")

OBELISK.

In addition to articles in our own pages, we give the names of a few authorities upon the subject. Obelisks served a similar purpose in Egypt to the stelæ of the Greeks, and columns of the Romans. With respect to their outlines, it has been found that their sides are slightly concave, to increase their apparent height. They were used in the 4th dynasty, and continued till the Roman period. Thothmes III. erected many, among them, Cleopatra's needle. Consult Kircher, "Œdipus Ægyptiaeus" (1654); Loega, "De Origine et Usu Obeliscorum;" Birch's "Notes upon Obelisks." In the 18th dynasty, religious ceremonies and oblations were offered to Obelisks, which were treated as divinities.

HITTITE REMAINS AND INSCRIPTION.

An interesting paper, read before the British Association on Tuesday, was one on the Hittites of Scripture by Mr. Boscawen. Mr. Boscawen is a linguist who has been endeavouring to prosecute still further the work of the late George Smith in Syria. Nothing has hitherto been known of the Hittites beyond what is told in the Bible, but the decipherment of the Egyptian and Assyrian inscriptions has revealed many particulars concerning them. It appears that the designation was applied to a powerful confederation of tribes of North Syria. Mr. Boscawen described the discovery of the site of their capital on the banks of the Euphrates. He showed by the inscriptions that the Babylonians came in contact with the Hittites about seventeen centuries before the Christian era. The effect of this contact is illustrated by the interesting fragment preserved in the book of Genesis relating to the purchase of the cave-sepulchre of Machpelah by Abraham. Here we find that the commercial system of the Babylonians, which was known to Abraham, the native of Ur, was also known to Ephron the Hittite. The hieroglyphics recording the campaigns of Thotmes III. and Rameses II., the Greek Sesostris, also contain references to the Hittites. Mr. Boscowen visited the ruins of the Hittite city during the early part of the present year. The monuments indicate the close relationship between the Hittites and the other early races of Asia Minor, and the route by which they proceeded to the Ægean Sea can be traced by them. A hieroglyphic syllabary was described, and reference made to a bilingual text recently discovered.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Cambrian Archæological Association.—This association, which held its annual congress at Pembroke during the past week, brought its proceedings to a close on Friday night. The points of interest visited on Wednesday were Castlemartin Church, Flimston Chapel, St. Govan's, Stackpole Church, and one or two other churches of archæological pretensions. Perhaps the excursion of Thursday was the most interesting of the series, taking in Nash Church, Upton Castle, Carew Castle and Church, Manorbier Castle, and Lamphey Church and Palace. At Carew Castle the Dean expressed an opinion that the chapel was in the inner ward of the eastern tower, notwithstanding the presence of a fireplace in the room. In the room above the chapel was pointed out a staircase, built in the wall of the tower. A range of chambers on the north side is said to have been the work of Sir J. Perrot, to whom Queen Mary granted a castle, he being then Lord President of Ireland. He afterwards was attainted and sentenced to death, but died in the Tower. The castle presents a combination of three styles of architecture, as pointed out by the Dean—first, the Edwardian or Norman fabric, the decorations of Sir Rhys ap Thomas to the inner face of the west side, forming a transition from the purely military portions of the edifice to the purely domestic additions in the Elizabethan style alleged to have been begun by Sir J. Perrot. A great feature in the Elizabethan portion is formed by two fine semicircular oriels running up the whole height of the rooms. At Carew Castle Sir Rhys ap Thomas held, in 1488, the first tournament which had ever taken place in Wales. There is a public cross in the road at the entrance to the village bearing an undecipherable inscription. In Carew church is the tomb of Sir John Carew and of his wife and their family of three sons and five daughters. Manorbier Castle, which was next visited, is famous as the birthplace of Giraldus. Here Dr. Harper, of Jesus College, Oxford, who is occupying the habitable part of the castle, hospitably received and entertained the visitors. The castle is situate convenient to a creek of the sea, not far from Tenby, and six cellars found under ground were, there seems every reason to believe, used by smugglers for storing their contraband goods. It is a fair model of a Norman baron's residence. The church is a very plain building—a chancel and nave divided by a row of pillars, without decoration of any kind. Lamphey Palace was the last place visited. It is valuable as an example of domestic architecture of the 14th century, and is said to have been built in great part by Bishop Gower. The last resident Bishop (Barlow) alienated the palace in favour of his godson, Richard Devereux, from whom it passed in 1600 to the Owens, of Orleton.

* * *

The Wesleyan chapel at St. Germains is about to be enlarged and altered from the plans of Mr. Johns, architect, of Saltash.

Building Intelligence.

Camberwell.—New schools for middle-class girls have just been built for the Mary Datchelor Charity, at the foot of Camberwell-grove, and will be opened next month. The chief elevation faces the Grove, and is 90ft. in length and 55ft. high, built in red Fareham brickwork, with Portland-stone dressings. In the centre is a Doric portico, of Portland stone, which leads to a flight of steps and entrance-hall 46ft. by 14ft., and the lecture-room, the latter 83ft. long by 45ft. wide, and seated, including gallery over entrance, for 700 people. On a level with this room are library, secretary's-room, head-mistress's room, and cloak-room, each 23ft. by 19ft. Beneath are four classrooms, also 23ft. by 19ft. library, master's-room, and mistress's-room, and in the basement are a dining-room, 86ft. by 45ft., second lecture-hall, and apparatus-room, and kitchens and offices. Mr. T. Chatfeild Clarke, of Bishopsgate-street, Within, is the architect, and the builders are Messrs. Grove, of Wilton Works, Islington. Mr. Joseph Williamson has acted as clerk of the works, and Mr. C. W. Brown as foreman of works. The ironwork was executed by Messrs. Young and Co., Pimlico; the gas-fittings by Messrs. Earl and Philp, Peckham; the hotwater-pipes for heating principal rooms, by Messrs. Phipson; the lavatories by Messrs. Doulton, Albert Embankment; and ventilating apparatus by Messrs. Ewart and Son, of Euston-road, W.

Eastbourne.—The foundation-stone of a new church about to be erected on the Upperton Estate, Eastbourne, was laid on Friday. The church will be a cruciform structure, consisting of a nave, north and south transepts, chancel, choir-vestry and clergy-vestry, and three entrance-porches. The nave will be 100ft. by 43ft., and 48ft. high to collar of roof, having tie-beams and principals and a barrelled boarded ceiling, divided into six bays in length, and in each bay a three-light traceried window will be placed. At the west end will be two three-light, surmounted by a rose-wheel window. The chancel will be 36ft. long, 24ft. wide, and 40ft. high to the apex of the hexagonal boarded and panelled roof, and will have a five-light window. Accommodation will be provided for 696 persons. Over the chancel-arch is a bell-turret, and under a choir-vestry. The materials to be used are: Kentish rag stone for external facing of walls, with Bath-stone dressings, the inside lined with patent pressed bricks, and the filling-in of concrete made with cement and sea-shingle. The seats throughout, and roof-timbers, will be all of pitch-pine, and the roof itself covered with Broseley tiles. The present contract, for the nave alone, is for £4,000, but a total outlay of £8,000 is contemplated. Mr. C. Haddon, of Hereford, is the architect; Messrs. Crowe, of the same city, are the contractors, their foreman of works being Mr. Smart.

Govanhill, N. B.—The memorial-stone of a new Established church, in course of erection at the junction of Allison-street and Cathcart-road, was laid on Saturday. The style adopted is Middle Pointed Gothic. At the angle of the roads will be a tower and spire rising to 150ft. in height. The church will be divided into five bays by buttresses, and the internal dimensions will be 80ft. by 53ft., exclusive of organ-chamber behind pulpit, and a height from floor to ridge of 55ft. The roofs are open-timbered, and will be dressed, stained, and varnished. There will be galleries on two sides and at the end in the interior of the church. The area and these galleries will seat 1,000 worshippers. Adjoining the church in Cathcart-road is a hall, 55ft. by 25ft., having a gable and traceried window in chief elevation, and at the rear will be session-house and vestry. Mr. Robert Baldie is the architect; the cost of erection will be a little over £7,000.

Halifax.—A new Wesleyan chapel of St. John is being built in Prescott-street, in place of that in South Parade, taken by a railway company. The chapel is Perpendicular Gothic in style, and consists of a nave with aisle 77ft. by 26ft. 6in., transepts 86ft. 6in. across and 24ft. wide, and organ-chamber attached to one transept; there is no chancel. The open roof is of red deal, and the seats and two galleries are of pitch-pine. The pulpit is octagonal, and is build of Caen stone; the columns are of Aberdeen granite. The old organ is being enlarged by Messrs. Foster and Andrews, of Hull. At the rear are schools, including a preaching-room 30ft. by 28ft., vestries and class-rooms on ground floor, and over these are assembly-room 70ft. 6in. by 30ft., with access from the transept galleries. Mr. W. Swinden Barber is the architect, and Messrs. Thompson, of Peterborough, are the contractors.

Knapton, Malton.—A reredos has just been erected in Knapton Church, some six miles from Malton. The Church of St. Edmund is an old building, in the main of Early Decorated Gothic type, consisting of a nave, chancel, and north aisle. From time to time judicious restorations have taken place therein, under the direction of Messrs. John Gibson and Son, architects, of Malton. The chancel has been rebuilt and its floor laid with encaustic tiles. Under the east window, which is a three-light one, the new reredos has now been placed. In character with the surroundings, this addition is Early Decorated Gothic in character. It is made entirely of well-seasoned English oak. The central compartment is the largest; on either side of it are triple buttresses, which, joined at their lower parts, become arched higher up, and terminate with lofty crocketed pinnacles. The gable between is canopied, and projects over the retable, being carried upon ebony columns. It is filled with Geometrical work of flowing character, and has crockets running upon either side. In the centre, and kept well up above the apex, is a tall, foliated cross. On either side of this, standing upon pedestals, are sculptured figures of angels blowing trumpets. This reredos has been made by Mr. Harry Hems, of Exeter, from the designs of Messrs. Gibson and Son, architects, of New Malton.

Morville.—The chancel of the parish-church of St. Gregory, Morville, Shropshire, was re-opened on the 24th ult. The chancel had been partitioned off from the church during the progress of works, which consist of a new east window of three lights, and the renewal of upper half of east wall, with copings and gable cross; the whole of the dressed-stone being white Alveley. The window, which is a memorial one, is of the Early English Geometrical period, into which stained glass has been introduced. In the centre light Our Lord is represented standing in the carpenter's shop, with outstretched arms, His shadow falling on a screen behind; on either side are Joseph and Mary, the former at work in his daily occupation, the latter with gifts offered by the Magi at her feet; above are three figures, two of them indicating persons engaged in the labours of the day, and the other resting by night, surmounted by the two great lights—the sun and moon. The glass has been executed by Messrs. Hardman and Co., London and Birmingham. A new heating-apparatus has been added, and the chancel-stalls have been arranged with a view of giving greater comfort to the occupiers, and width to the passage. Mr. T. Gordon is the architect, and the contractors are Messrs. Wall and Hook, of Stroud. The cost of the work amounts to nearly £400.

North Yorkshire.—The work of restoring some of the ancient churches which stud the vales of North Yorkshire is again receiving a powerful impetus. One of the oldest churches in the kingdom has just been taken in hand. The historic church of Kirkdale, near Kirbymoorside, is said to have been built antecedent to the Norman Conquest. The church is dedicated to St. Gregory, and is of very mixed architecture, consequent on frequent repairs. The most dilapidated portion is the chancel, to which attention is being given. A new Gothic roof, of oak, and slated, will replace the old flat one. A new three-light east window is to be inserted, and also one in the south wall of the chancel. The old painted seats in the chancel are being removed, and something more appropriate will be substituted. The restoration is in the hands of Mr. S. Crowther, architect, of Manchester, and the contract will be carried out by Mr. Mark Foggett, builder, of the same city. Not very far away from Kirkdale, the restoration of another very ancient church is about to be undertaken—that of All Saints', Nunnington, near Helmsley. This church was built about 600 years ago, and was partially rebuilt in 1671, when it was apparently much smaller. It is now in a most dilapidated condition; in fact, it was condemned as thoroughly unsound thirty years ago. The proposition was first to pull it down completely, but now a thorough restoration has been determined on; and Mr. Ewan Christian, the architect of the Ecclesiastical Commissioners, has been entrusted with the work, which will include the removal of the low white-washed ceiling of the chancel and nave, the formation of a new side aisle, but putting back the cracked north wall; building of new open roofs, rebuilding of vestry and porch, adding an organ-chamber and new organ, opening out the tower and facing the unfinished west arch, substitution of open seats and new reading-desk for the present antiquated affairs, and the introduction of a proper system of warming and ventilating the church. Thirty-six additional sittings will be gained in the aisle, and eighteen more in the tower, by the alterations, which, it is estimated, will cost £2,200.

PARLIAMENTARY NOTES.

The "Memorial-Refuge" in Fleet Street.—On Tuesday, Mr. Firth asked the Attorney General whether an information for intrusion under the Act 28th and 29th Vic., cap. 104, will lie at his suit against the Corporation of London in respect of this contemplated erection as causing an obstruction, and whether he is prepared to exhibit such information. The Attorney-General said it was a fact that the Corporation of London intended to erect the refuge, and in the midst of it a memorial to commemorate Temple Bar. The Corporation claimed a right to do so, and the Government, as represented by the Board of Works, had given their permission.

CHIPS.

The Pen-bridge, at Maryhill, near Glasgow, is about to be rebuilt and the canal straightened. Messrs. Morrison and Mason, of Glasgow, are the contractors.

Melville parish-church, near Montrose, has been internally restored and a new organ erected. The work has been carried out from the designs of Mr. Sim, architect.

The complete buildings of St. Benedict's Monastery, College, and Hospital, at Fort Augustus, N.B., illustrated in our pages by a perspective view, February 22nd, 1878, were opened on Tuesday week. 13th-century Gothic is adopted throughout as the style. The site is that of the Old Fort, and has, together with large contributions to the endowments, been given by Lord Lovat. Messrs. J. A. Hansom and Son, of Kensington, were the architects, and Mr. Stokes has acted as clerk of the works.

The reopening of the parish-church of Norbury took place on Wednesday week. The nave (there are no aisles), has been wholly rebuilt, the old pews being removed, and open seats provided for 108 persons. The ceiling is decorated with stencil work by Mr. Pugh, painter, &c., Bishop's Castle. The architect is Mr. Cursen, of Lincoln's Inn Fields, and the contractor Mr. W. Coles, The More. The total expenses are estimated, in a statement recently issued, at £723.

The architect of the Austrian Department of Public Works has officially reported that the Cathedral of Trent, the place where the celebrated Council was held in the middle of the 16th century, is in a dangerous state, and will need very extensive repairs.

At a meeting of the Court of Sewers for Boston, Lincolnshire, held last week, a report and plans prepared by Mr. Lancaster, the engineer to the court, for the improvement and lowering of the main drain, was adopted, at an estimated cost of £1,450.

A new head-master's and boarding-house has just been added to the Grammar-school buildings at Brigg. Messrs. Goddard, of Lincoln, were the architects, and Mr. Parker, of Brigg, was the builder.

The Committee for the Restoration of North Walsham Church, Norfolk, opened last week five tenders for the rebuilding of the nave-roof, and other works. Although the difference between the highest and lowest, (the latter from Messrs. Cornish and Gaymer, of the same place), was £1,100, none was accepted, all being much higher than the estimate.

New grammar-school buildings are being built at Spalding, at a cost somewhat exceeding £3,000. Mr. Bulling is the contractor, and the work is to be completed by the 1st January, 1881.

The foundation-stone of a new vicarage was laid at Hopley Bells, Elsham, last week. The architect is Mr. James Fowler, of Louth, and the contractor, Mr. Parker, of Brigg.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

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U. S. A. (No.)—H. M. ("Building Construction," Rivingtons.) — Westmoreland. (There are none. When there was one those who should have supported it were indifferent, and it was discontinued.)—C. Havelock. (There is no good book on the subject. You will find some good information in Ure's Dictionary. Ask a query in "Intercommunication" or in the *English Mechanic*. You would probably get more information through the pages of the latter journal.)—Arnold. (All drawings are returned, but the club is in abeyance during the vacation season. Fresh particulars will be announced in due course.)

"BUILDING NEWS" DESIGNING CLUB.

The authors of the drawings not yet returned bearing the following mottoes are requested to send their addresses so that their drawings may be forwarded:—D'Ewes, Duncan, McAlister, Honey Dew, E in a Lozenge, I Strive, Perseverantia, Pendennis, Streonshalk, Sanctus Cuthbertus, Through, with Sword in Circle.

Correspondence.

QUANTITIES.

To the Editor of the Building News.

Sir,—With a considerable portion of the paper prepared and read by Mr. Hughes at the late meeting of the Master Builders' Association, held in Bristol, I heartily agree. I regret deeply that such a paper should be needed, but it is undeniable that quantities, nowadays, are not always prepared as they ought to be, and the best reason I can assign for the gross carelessness which too often exists is the desire to get through work with as little trouble as possible, a state of affairs not wholly confined to architects and surveyors. I think Mr. Hughes is manifestly unfair to provincial surveyors, when he speaks so highly of the doings of their

London brethren; his remarks are evidently intended to disparage the former.

Before me I have sets of quantities which have been prepared by Liverpool, Birkenhead, Cambridge, and London surveyors, and if there are black spots on the Mersey, I can find equally black on the banks of the Thames.

In a set of quantities prepared by a Liverpool surveyor, I find 2 pinnacles for a church, described as follows: "2 pinnacles as per drawing well and securely dowelled and cramped (exclusive of carving)." The drawing, a 1-6th scale tracing, is appended to the quantities and shows them to be octagon on plan, one measuring about 13ft. high and 3ft. across, the other is about 23ft. high and 4ft. 3in. across, and it may be easily surmised that the amounts put down in the different tenders were extremely varied. In the same bill I notice an item given of "supl. stone in sills," but no thickness is named. Further on, in the carpenters' and joiners' work, I find the flooring-boards given as so much material only, and a little lower down the page there appears—"supl. labour only to flooring and joisting." Now the same area for both cannot be right, either the amount for flooring is too great, or the wall-hold for joisting has been altogether forgotten; but stay—perhaps the glorious system of averaging has been adopted in order to save time and trouble. The staircase is described by the number of steps, the length being given; but the price is to include notch boards, etc., with an extra for winders. It is evident that this loose style must commend itself to many builders, and must pay well, otherwise contractors would not be so desirous to do work in such offices.

From a set of quantities by another Liverpool firm, I pick out the following: "435ft. cube stone in plain heads, imposts, sills, and copings. 264ft. 6in. cube stone in moulded factables." Beyond that no further information is given to guide contractors as to the proper value of the work.

From another set of Liverpool-prepared quantities I extract the following: "638ft. cube stone in buttress weatherings, and dressings to doorways and all labour."

At the end of all these quantities 2 per cent. is faithfully appended for the very meagre amount of information afforded.

Examining another set of quantities prepared by Birkenhead surveyors, the following items appear in the bill:—"The contractor must distinctly understand that no lining up to gables or beam filling has been taken separately, but has been measured in with the common brickwork, nor any common discharging arches over lintels, although same must be provided where necessary to take the superincumbent weight above." Again, "provide and fix all centres, numbering 60 or thereabouts [mark the care taken], the greater number will be simply turning pieces for 4½in. soffits." You will perceive no length is given; they may be 18in. long, or the openings may be 3 times that size. The stairs are also given in a loose manner, and for work done in this way a charge of 2½ per cent. appears in the summary.

But if Liverpool quantity-taking is in such an unhealthy state, and the evil is widespread, I am sorry to find the same disease existing in places further south. From quantities prepared by a Cambridge surveyor, I select a few items, "715 yards supl. reduced brickwork to the standard thickness of 14in., all openings being deducted which contain more than 10ft. supl." Now there is no labour given for openings, and I have searched in vain for the beam filling to walls, and the cutting and lining up of gables, items necessary to complete the work. The masonry items are still more imperfectly given, and are as follows: "46ft. 2in. cube splayed, weathered, and throated sills," "50ft. 6in. cube wrot chamfered heads," "150ft. 6in. cube moulded and throated gable copings," and "103ft. 6in. cube springers, bonders, and apex stones." It may reasonably be asked, how can any man affix prices to such quantities? It is not sufficient to say that the plans can be seen at the architect's office. Turning next to the carpenters' and joiners work, I find the whole of the timber for "lintels, plates, tie beams, spars, joists, etc.," under one heading. Does that surveyor fancy that lintels are worth the same value as framed principals or even joists, or rafters? If so, then I am afraid the joiners of whom Mr. Hughes speaks so disparagingly could teach him something different from that. I may, in passing from this set of quantities, inform the surveyor whose name is attached to them, that Liverpool contractors' price labour to openings at about 10d. per supl. yard reduced to brick length.

Moving on to the land of Goshen, and looking through bills of quantities which have been prepared by London surveyors, I find that even they have not attained to perfection, and I make bold to say that bad as matters are on the Mersey, they can be matched even in the capital.

From one set I cull the following particulars, "Supl. labour to hollows or openings in brickwork having splayed jambs, including plumbings and the rough arches over them." "Cube stone, including waste and all plain labour to beds and joints, and hoisting and setting." Why not measure beds and joints, my London friend, and let the mason understand the actual amount of *chiselling* required. In the same bill, I find that the "slates are to be nailed with copper nails of approved pattern and weight." Very clear and distinct this—a contractor could make no mistake as to what was meant. In other respects, I admit that care has been taken, in the preparation of these quantities, and, therefore, the slips which I have referred to are the more inexplicable.

Turning to another set, also by a firm of London surveyors, I find that the masonry items for a public building are taken in the most slipshod manner. The tenders for a tower to that building, ranged from £543 to £1,387, and the great difference between the two amounts must be partly owing to the lack of sufficient information. I hardly think that the difference can be attributed to the same cause as that assigned by Mr. Hughes, "that the first included only stone and setting," the various items being described as follows: "—ft. cube stone in sunk, weathered, and moulded sills." "—ft. cube stone in moulded strings." "—ft. cube stone in moulded capping to pedestals," and so on. But the cream of the joke is in the fact that there are "1,672ft. cube stone in the uppermost, 45ft. of the lower, including all labour as sketch A at end of bill," and when I look at this sketch I find it to be drawn to an ⅛ scale. That beats our Liverpool friend with his pinnacles, and so I leave your readers to reconcile as best they can the statements made by Mr. Hughes when read in the light of these selections.

It is evident that changes must soon take place in the methods adopted at present in preparing bills of quantities, and I shall just pick out two items which appear pretty regularly in London bills, in fact, Banister Fletcher in his book on "Quantities," recommends these modes for adoption: I refer to joisting and door frames. Take the case of a building where the scantlings of joists vary from 11in. by 3in. to 6in. by 2½in. The last-named must, when fixed, be worth considerably more in price than the first. Give the cube timber if you please; that is the fair way between the proprietor and contractor, but give also the supl. labour to the various sizes of joists; the same remark applies with equal force to rafters and stiling. The other case is still worse; to put a 4½in. by 3in. door frame into cube timber along with another 6in. by 6in. in scantling is catching, the first-named holding a higher relative value than the latter. Let each be given linl., and the builder then knows exactly what he is doing. Stone should also be dealt with in the same careful manner, and unless that is done it is nearly impossible to arrive at its true value. I will just assume a case. Take, for instance, the cube stone in plain heads where some may be 14in. by 14in., others 14in. by 9in., and others 14in. by 4½in., and beyond the cube stone no items appear for labour; in the case of the smallest scantling, the labour, polished or otherwise, on the face is as 3 to 1 to the other scantlings, and yet that method is spoken highly of by some builders. In the case of mullioned windows with transoms, the evil must be greatly intensified. This method, spite of those who uphold it, is unfair to owner of the building as well as to contractor. Unless the contractor supplements what is given by going carefully into the matter (in other words, takes out his own quantities), he will probably either make more than a legitimate amount of profit out of the work; or it may be that in his anxiety to get the job he prices rather fine, and thus runs a risk of losing a considerable sum; then begins the usual amount of worry to architects. Now I say that stone from 6in. and upwards ought to be taken "cube, including hoisting and setting," and the whole of the different descriptions of labour taken afterwards in supl. and linl., as the circumstances of the case may demand, and if builders would make up their minds as to the changes required, I think architects and surveyors would meet them, and discuss with fairness the points at issue. Let us no more hear, however, about the proposition occasionally propounded of having the quality of work classed as 1st, 2nd, 3rd, 4th, and 5th, perhaps even lower than that, for there is no knowing to what depths we may go, and when the work is completed calling in a surveyor to measure up the same, and decide under which of the several grades it should be paid. There is here an attempt, but poorly concealed, to set the architect aside altogether. He is to draw the picture, but with the quality of the work he must not interfere. But I fear it will be a long time before architects will allow themselves to be relegated to that position.

Coming now to another part of our author's paper, I am anxious to know on what grounds Mr. Hughes objects so strongly to joiners, bricklayers, and masons acting as quantity clerks. His condemnation is too sweeping in its character, and is not qualified by a single phrase. I cannot see by what process of reasoning I should be considered unfit to perform these duties on the score that I once was in his employ. I join issue with him on that head, and I am prepared to hold that my training in a workshop *ought* specially to fit me to perform that particular work. Do builders not regularly trust their foremen to measure up work, and see that they, the builders, get their *pound* of *flesh?* Ease your harsh expression, Mr. Hughes, and I will agree with you that some sort of an examination is necessary. But if necessary for those desirous of becoming surveyors, and there is honour to the man who gets out of the ranks, I think it just as needful that builders should also conform to a test before being allowed to qualify. How many are there who do not know what a rod of brickwork contains in supl. yards, who could not tell the cube timber in the various standards of deals and battens, and who are equally in the dark as to the contents of a rood of slating. I know an employer of labour on a large scale connected with one of the building branches who lately did not know what triglyphs were, with mutules and drops. He knows now.

I have previously admitted that quantities are not in all cases just as perfect as they ought to be, but I know builders do not always read carefully what is even written in bills of quantities. Let them, before affixing prices, do this, and many egregious errors will be avoided. A circumstance which took place a few years ago, and now comes to my recollection, will illustrate what I mean. A firm of builders claimed an extra for some work which they had executed in Portland cement, instead of doing it in Roman cement, as specified. The change from Roman to Portland was made on their own suggestion, but no hint was then given that an increased price would be required. Now the Portland cement, as used, was mixed in the proportion as one of cement to two of sand, whilst the architect's specification, and likewise the quantities, specified that the Roman cement should be mixed in inverse proportions, viz., two of cement to one of sand. When the work was squared up, a claim of 1s. per yard was made for the privilege of substituting the former for the latter. The claim was resisted, and the matter carefully gone into, with the result that the balance in contractor's favour did not exceed ½d. per supl. yard. Strong objections were raised against the small amount allowed, and it then came out that the quantities were priced without the items being carefully read over. As one member of the firm said, whilst the matter was under discussion:—"We took it that the cement was to be mixed in the ordinary way." Now architects and surveyors have a sufficient use for all the brains they possess, without undertaking to supply that useful commodity to builders on a large scale.

My letter is, I fear, far too long, and may not come up to your standard, or I might have touched on other points in the paper by Mr. Hughes, for I find that even in the quantities where the painting is mixed up with the joinery, and which he so mercilessly criticises, there are some extenuating circumstances. I admit, as a copy of that bill now lies before me, that it cannot be defended, especially in the items where doors, casings, &c., are so wonderfully jumbled together (it is bad workmanship, like a good deal of the building which goes on nowadays), but would there have been any great difficulty in the way, Mr. Hughes, had you just added about 1½d. per supl. foot to the price of your work to cover painting, seeing that these "joinery and painting items" are generally marked thus* it being understood from the bill that the work may or may not be done.

I have, in what is written, "extenuated nought, or set down aught in malice," and with many apologies for troubling you,—I am, &c.,

Liverpool, Aug. 26. Edward Reid.

SCHEDULES OF PRICES.

Sir,—From a contractor's point of view, schedules of prices have their advantages and disadvantages. Among the former is, that all work performed will be paid for, whereas, with a bill of quantities, under a lump-sum contract, this by no means follows, so many imperfect documents of this kind being nowadays placed in the hands of builders. Unless the bills of quantities are prepared by a properly qualified surveyor, the builder is almost certain to find important items omitted or so badly described that he is often misled into inserting inadequate prices. When the contract is taken under a schedule of prices, *all* the work is measured, and it is the builder's own fault if anything is left unnoted. The schedule, it is true, may have been also prepared by an incompetent person, but if the items are not clearly described, the builder is under no obligation to accept them, and he can insist on being paid the actual cost of the work plus a reasonable addition for profit.

The disadvantages attaching to a contract under a schedule of prices are, that the architect or his employer is enabled to vary the work, a proceeding which is more the rule than the exception. This often entails great loss to a contractor if the variations are at all extensive, as it may cause a quantity of materials which he had ordered for the work to be thrown on his hands, and he can rarely enter into engagements with the merchants in order to secure himself against a rising market after he had made his tender. Schedules of prices are not always prepared with sufficient care, the prices being often filled in haphazard, or culled from some of the published price-books.

Unless the builder is permitted to insert his own prices, it is only those who have experienced it that can form any idea of the difficulty in tendering at all on a schedule that is badly prepared. The writer has met cases in which he found it impossible to estimate a percentage that would enable him to secure himself against loss without risking the contract. These observations apply with greatest force where a number of fancy items are inserted because the compiler thinks they might be of use, as we see in many Government schedules, which are often made very complicated, and necessitates the employment of a sharp surveyor, who, of course, expects remuneration according to his repute for sharpness; otherwise the builder, who has not time to devote to the unravelling of a complicated schedule, would often be compelled to accept any interpretation which the architect chose to adopt.

For extras and omissions on a lump-sum contract, obviously the bill of quantities forms the best schedule to price them by; but in that case the builder is entitled to some compensation for omitted work, at least, to cover loss on orders already given for materials, &c., which would be rendered useless, and to cover losses arising from having his arrrngements for carrying out the work interfered with.—I am, &c.,

J. S.

ST. PAUL'S CHURCH, HAMMERSMITH.

Sir,—I am very glad to see by your illustrations of the above, in the Building News for last Saturday, that some one has thought it possible to design a building without "fussiness or pretentious ornamentation"—*i.e.*, carving. As far as I can find from your illustrations, the only approach to carving is in the dog-tooth ornament in the chancel arch. The absence of this usual adjunct is so marked, that I think it must be intentional, especially as the funds seem to have been ample.

I think if architects would aim at breadth and dignity of design, with good proportions, instead of endeavouring to get effect from merely covering their buildings with what is not unfrequently badly-executed carving, we should have more sensible architecture.

To me, though I know there is precedent for it in some of the best Mediæval structures, it seems quite out of place for a bunch of leaves and flowers on a cap to be apparently supporting a large and heavy mass of building. For capitals, nothing in my sight looks so well as our own (indigenous, if I may so call it), Early English Moulded Cap; it can be adapted to the richest or plainest building. Another way in which carving is often inappropriately used is to stop a hood-mould or the bottom of a vaulting shaft. I think the plain "stop" to the vaulting shafts of "St. Paul's" looks better than any cluster of flowers and leaves. I think also foliated finials are out of place. I believe that the original object of finials was to add weight to the apex of a gable. If this was the origin of finials, does it not appear that it would be better attained by something more weighty than foliage?

Again, we have less chance of getting our designs carried out as we wish in floriated ornament, for, however carefully the sketches are made, the carver will vary them; but if you give a design for a geometric pattern, which is worked by rule and figures, you at once *fix* the "workman," and he is unable to, as I have heard them say, "improve" the design.

Messrs. Seddon and Gough were well able, from their known position and authority, to enforce the carrying out of a building designed without carving; but younger and less known men would be unable, so prejudiced is the public mind for carving, or, as they call it, "ornament." I am sorry so many "truckle" to this mistaken taste of the public. I feel quite confident that both our ecclesiastic and secular buildings can be successfully carried out without the aid of carving, especially on the exterior of the building, where the smoke of our large manufacturing towns soon turns it black, and it appears like a shapeless patch of dirt.

If carving must be admitted on the exterior of a building, I would limit it to panels and like situations, and it should be very much conventionalised.—I am, &c., D. M.

30th Aug.

BRISTOL TRADE SCHOOL COMPETITION.

Sir,—As I am aware you are always ready to expose the evils of Architectural Competition, may I beg the favour of the insertion of the inclosed correspondence, which has taken place in connection with the advertisement that appeared in your paper of Aug. 20, with reference to the proposed new Trade School for Bristol.—I am &c., Wm. L. Bernard.

31, Clare street, Bristol.
31st Aug., 1880.

31, Clare-street, Bristol.
24th August, 1880.

PROPOSED NEW TRADE SCHOOL, BRISTOL.

Sir,—I observe in the advertisement in the Building papers for designs for the above, that competitors are requested to forward you one guinea for particulars. May I ask if this amount will be returned to those who send in designs?—I am, Sir, yours truly,

Wm. L. Barnard.

G. H. Pope, Esq., Treasurer, Society of
Merchant Venturers, Bristol.

Merchants' Hall.
24 Aug, 1880.

TRADE SCHOOL COMPETITION.

Sir,—The guinea will not be returned.—Yours truly,

George H. Pope.

W. L. Bernard, Esq., 31, Clare-street.

31, Clare-street, Bristol.
27th Aug., 1880.

PROPOSED NEW TRADE SCHOOL.

Dear Sir,—I am obliged by the receipt of your letter respecting the above. I trust the Society of Merchant Venturers will reconsider the matter, as, by the present arrangement, competitors will be paying for the premium out of their own pockets.

I do not observe any mention in the advertisement as to whether a professional referee will be consulted, or whether the successful competitor will be employed to carry out the works; possibly, information on these points is in the Particulars, but, if not, would you kindly favour me with a reply respecting same?—I am, dear Sir, yours truly, Wm. L. Bernard.

G. H. Pope, Esq., Treasurer, Society
of Merchant Venturers.

Merchants' Hall.
27 Aug., 1880.

TRADE SCHOOL COMPETITION.

Dear Sir,—No change will be made in the conditions of the above; the Society do not bind themselves to employ a professional referee, or to employ the author of the successful design. Full information on these, and other points, is contained in the Particulars.—Yours truly,

W. L. Bernard, Esq. George H. Pope.

31, Clare-street.
27 Aug., 1880.

TRADE SCHOOL COMPETITION.

Dear Sir,—I thank you for your information in reply to my queries.

I intend to publish the correspondence in the Building papers, and presume you will have no objection,—I am, dear Sir, yours truly, Wm. L. Bernard.

G. H. Pope, Esq., Treasurer, Society
of Merchant Venturers.

Merchauts' Hall.
27 Aug., 1880.

TRADE SCHOOL COMPETITION.

Dear Sir,—My letters are, of course, entirely at your disposal.—Yours truly, George H. Pope.

W. L. Barnard, Esq., 31, Clare-street.

Intercommunication.

QUESTIONS.

[6212.]—**Racket Court.**—I shall esteem it a great favour if some brother-builder will kindly assist me with advice in the following particulars:—Would cement concrete give satisfaction, or would asphalte be more likely to do so in floor? Would Portland cement finely finished on rubble walls be satisfactory? The building being 66ft. by 30ft., how much of the roof should be glass? Would lighting from north side only be best? What description of roof, and what system of glazing should I adopt? Are these dimensions sufficient, and what height should there be to wall-plate?—Wishing to do Right.

[6213.]—**Chancel Walls.**—Will some one kindly tell me if, in those churches where the chancel walls are not parallel to the nave or aisle walls produced (1) the chancell walls go off at any particular angle, and if they do, (2) what is that angle? also (3), whether the east wall of the chancel in such cases is usually at right angles to the sloping walls, or whether it is parallel with the west wall of the church?—Attenboro.

[6214.]—**Indian Ink.**—Can any reader kindly inform me which is the very best Indian ink made for architectural drawing, ink that will stand washes of colour well, and where it can be obtained? Also the best colour for obtaining a clear shadow on drawings?—F. F. B.

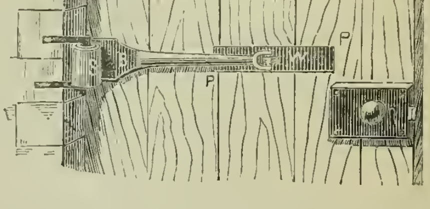
[6215.]—**Centrolinead.**—Will any reader kindly explain to me the method of setting Stanley's centrolinead for perspective drawing, or let me know in what back number of the Building News I can obtain information?—J. B.

[6216.]—**Iron Houses.**—I shall be very grateful for any information of a practical character on the above subject. (1) As to their cost and durability; (2) as to the comfort of living in them, both during summer and winter. I have a small house and an increasing family. My idea was to erect such a building for the purpose of a day and night nursery.—Medicus.

[6217.]—**Band-Saws.**—Can any of our readers give me some information as to the working of band-saws, the gauge, best shape of tooth for cutting wheel-felloes and hard English timber generally, the right amount and best method of setting the teeth of the saw-blade, and the correct speed to run at? Also, any book treating on the working of saw-mills, and oblige—An Estate Steward.

REPLIES.

[6192.]—**Spring to Close Church-Door.**—I have seen a door closed this way; it is an effective and silent appliance. S is a box, fixed to the wall, containing a strong spring, which presses the rod B B against the door. The rod B B has, at the end a fork, with a small wheel (W) running into it. A plate of iron (P P) protects the door from the wheel.—Isaac Williamson.



[6192.]—**Spring to Close Church-Door.**—I read some years ago of an arrangement which may be of use to "T. R. P.," as it effectually overcomes the great objection to the weight and pulley method of closing. It consists in causing the weight to descend inside a tube with a closed bottom. The tube is fitted with a piston, to which the weight is attached. This arrangement renders the motion so slow that no noise is caused either by the pulley or by the door's coming to rest against the lintel. The tube need not be more than 1in. in diameter, and the piston must be a loose enough fit to allow the air to pass it slowly. The bottom or closed end of the tube must be fitted with a valve opening inwards, to allow air to enter below the piston when the door is being opened. I cannot say whether this ingenious device is patented, but can answer for its practical working.—Musica.

[6204.]—**Cathedrals.**—The best way to answer Mr. Fred J. Freeman's question in your last number is by reversing it, and saying what cathedrals the late Sir George Gilbert Scott had nothing to do with architecturally. Those, I believe, in England were York, Carlisle, Bristol, Wells, Winchester, and St. Paul's. On some of them he had reported, however. In Wales, Llandaff. Most unfortunately there is no perfect list of either the ecclesiastical or secular buildings Sir Gilbert was engaged on.—Jas. Thos. Irvine.

[6204.]—**Cathedrals.**—Sir Gilbert Scott did the following cathedral restorations:—Canterbury, the new choir stalls; Rochester, general; Chichester, the central steeple; Salisbury, general; Winchester, choir screen and Bp. Wilberforce's tomb; Exeter, general; Gloucester, general; Ely, general; Peterboro', structural repairs; St. Alban's, general; Durham, choir screen and rearrangement of stalls; Chester, general; Ripon, general; Lichfield, general; Worcester, reredos, screen, &c.; Hereford, general; St. David's, general; St. Asaph, general; and Bangor, general. Sir Gilbert has notes on all his works at the above places in his "Recollections," &c., published a year or two ago by his son.—H. C. S.

WATER SUPPLY AND SANITARY MATTERS.

Ely.—The local board of Ely have drawn up a report on the water-supply of the city, in consequence of memorials addressed to the Local Government Board by the Dean and Chapter and the principal ratepayers. The report admits that the present supply is unsatisfactory, and says that it arises from four causes: a greater demand for water than was at first contemplated; the reduced area of the filter-beds; the want of settling-beds, and of a larger area for filtration. It is pleaded that the reason for inaction is the heavy debt for previous works, which will, for five years to come, entail a rate of 20d. in the £; and that, however unsatisfactory the supply of water is, the death-rate has been steadily diminishing, from an average of 25·6 per 1,000 in the seven years prior to the application of the Public Health Act, in 1848, to 19·13 per 1,000 during the past eight years. A report from Mr. Tomlinson, C.E., recommends the provision of deposit or subsidiary beds and other improvements. The Local Government Board have replied, stating that the local board for Ely will be much to blame if they continue the distribution of such water as is now supplied, and urge the board, without further delay, to determine on a suitable scheme of water-supply.

Swansea Waterworks.—On Tuesday an excursion of members of the British Association was made to the Swansea Waterworks at Velindre. The waterworks consist of two capacious reservoirs, holding together 460 million gallons of water. The largest, the "Lliew," is now under repair, in consequence of a leak having been discovered in the embankment crossing the valley. The construction of this reservoir was completed in 1867, with an embankment 80ft. deep, and a water area of 32 acres; depth of water, 66ft.; holding 300 millons of gallons, and delivering water into the town with a pressure of 400ft. head. Great engineering difficulties had to be overcome, owing to the uncertain and varying nature of the bottom, springs, rock joints, and fissures appearing, the surface of valley being only sparingly covered with alluvium. About 1873 it was discovered that the dam embankment across the valley showed signs of depression, and a leak appearing at the same time, it was decided by Alderman Ford and his committee that a new reservoir should be constructed and the leak repaired. In order to accomplish this it was necessary to construct a new reservoir to supply Swansea during the repairs of the Lliew reservoir, and the "Blaenantddu" reservoir was completed in 1879. Unforeseen difficulties in the construction of this reservoir appeared and delayed its completion, but by the skilful advice and direction of Mr. Edward Cousins, the engineer to the Corporation, the contractors, Messrs. Green, successfully completed this important work, the embankment being 80ft. high, with a water area of 24 acres, holding 160 million gallons. The repairs to the Lliew reservoir are just completed at a cost of £12,000. The members of the excursion, on reaching this spot, were conducted over the works by the resident engineer, and afterwards the cause of the leak, the various statistics relating to the reservoirs and the water supply, were illustrated and explained by means of a large number of diagrams, and a paper prepared and read by Mr. Cousius, C.E., who designed and constructed the reservoirs, in conjunction with Mr. Robert Rawlinson, C.B.

LEGAL INTELLIGENCE.

An Architect's Account.—At the Bradford County-court on Monday, before Mr. Daniel, Q.C., Judge, and a jury, an action was tried in which Mr. F. B. Payton, architect, claimed the sum of £35 11s. 4d. from Mr. Isaac Woodiwiss, contractors' agent, for work done in superintending the erection of five dwelling-houses in Horton Park-avenue, Bradford. The plaintiff stated that after he had been paid the sum of £50 by the defendant for professional services in connection with the completion of the plans, the preparation of quantities, and the acceptance of tenders, the defendant asked him to superintend the work, for which it was agreed he should receive £30. On behalf of the defendant, who had paid £1 3s. 6d. into court, it was contended that there was no agreement to pay anything in addition to the sum of £50 previously paid. The defendant, however, admitted that he expected the plaintiff to superintend the works. The jury gave a verdict for the plaintiff for the full amount claimed, with costs.

CHIPS.

New waterworks for the supply of Tiverton were formally handed over to the corporation of that town on Monday week by the contractor, Mr. Willey, of Exeter. The filter-beds and reservoir are situated at Chettiscombe.

Some correspondence has recently taken place in the Essex newspapers on the destruction of monumental records during restorations, a matter to which attention was called in the annual report of the Essex Archæological Society, read a month since. The latest letter on the subject is signed by W. Sims Horner, who states that in Epping Church the floor of the chancel was till recently formed of monumental slabs, recording several generations of the Conyers family, of Copt Hall, but that since the restoration of the building coloured tile paving has replaced them. He asks, "Where, now, are the inscribed slabs?"

New baths were opened at Queen's Cross, Dudley, on Monday week. They have been built for the corporation of Dudley under the supervision and from the designs of Mr. Alexander Smith, engineer, at a cost of £7,000. Messrs. Holland were the contractors.

An exhibition of sanitary apparatus, appliances, and articles for domestic use and econmony will take place at Exeter from the 21st September to the 9th October, in connection with the congress of the Sanitary Institute of Great Britain.

The four railway companies interested in the Forth Bridge scheme have decided not to proceed with the erection of the bridge, and the contractors have received notice to cease operations. The revelations of the Tay Bridge inquiry are said to have destroyed public confidence in the undertaking.

A wooden hall, 70ft. by 36ft., and seating 1,000 people, is being built for the Salvation Army at Ebbw Vale. M. J. Parry, of Cardiff, is the contractor.

The engineers' report presented to the half-yearly meeting of the Swindon, Marlborough, and Andover Railway Company last week states that the works of the railway are being so energetically prosecuted by the contractors, Messrs. Watson, Smith, and Watson, that there is every probability that the whole of the works between Swindon and Marlborough will be completed by the end of the present year. 250,000 cubic yards, or more than one half of the earthworks of this section, have been finished. Twelve highway and other bridges are finished, and ten more are in progress, and a portion of the permanent way has been laid.

The Baptist Chapel in Ramsden-road, Balham, was reopened last week after the completion of alterations carried out by Messrs. Higgs and Hill, who built the chapel. The apse behind the pulpit has been filled with appropriate decoration designed and executed by Mr. E. L. Voice, who has also ornamented the organ-case and gallery front and recoloured the walls. A heating apparatus has been supplied by Mr. G. Treves, of Balham.

The first of the large iron girders that are to form the bridge at Shute Mill, near Teignmouth, for the recently doubled line of the Great Western Railway, was placed in position on Sunday week. The girder is 70ft. span, and weighs 14 tons. The work is being carried out by Mr. George Palmer, bridge contractor, of Neath. In connection with the widening of the line, the western tunnel at Teignmouth has been removed, the double railway being carried through an open cutting, protected by substantial walling. The work of removal of the crown of tunnel has been completed during the present week.

There is a likelihood of the industrial dwellings system receiving a trial in Liverpool. The Corporation recently swept away some objectionable buildings in a part of the city known as Nashgrove, and the Health Committee have recommended that the Council should seek the approval of the Local Government Board for the erection by the Council of a number of artisans' dwellings. The estimated cost of the scheme is £115,000.

Our Office Table.

Mr. Broadhurst has given notice that he will this (Friday) evening ask the First Commissoner of Works whether there is any truth in the statement which appeared in the *Globe* on August 20th to the effect that a statue of the builder of the New Law Courts is to be placed on a pedestal in that building; and, if so, whether there is any precedent for the erection of a statue in a national building to a contractor; and, if there is not, whether he will take steps to prevent such an erection. Mr. Broadhurst has been somewhat misled by our contemporary. Neither pedestals for, nor statues of, the architect and builder are proposed to be erected. The corbels supporting an oriel window on the north side of the great quadrangle of the courts—over the double doorway into Carey-street—are, however, being carved with busts of the gentlemen named. The western corbel, that to the left, is finished, and shows Mr. G. E. Street, R.A., looking upwards and towards the Fleet-street end of the quad; the features are somewhat sharply chiselled, the right hand holds a pencil, while with the left the architect leans upon the wall and grasps a scroll. The representation of Mr. Bull, sen., was yesterday being modelled in clay.

An improved drawing pen has been introduced by Messrs. A. W. Faber and Co., for drawing curved lines as well as straight ones, and from using this invention, which is known as "Sprenger's Patent," we think, by many who are in the habit of making drawings with long and delicate curves, especially, that this new pen will be considered a great acquisition, as it works with a delicate nicety of action, and its excentric centre of gravity always causes the pen to follow the movement of the hand which uses it. The screw, which regulates the thickness of the line, works with an outgoing thread, the pressure in the spring of the pen itself being inwards, so that an even thickness of line is secured, and the variable pressure of the pen against the edge of either Tee-square or curve is never liable, when Sprenger's pen is used, to vary the thickness of the ink line, as is the case with ordinary drawing-pens where the pressure of the spring is in an outward direction.

The attention of the House of Commons was drawn on Tuesday to the "Refuge" which the Corporation of London are erecting on the site of Old Temple Bar. Nobody seems to have any power to stop the intrusion of a very indifferent piece of art on a spot where every inch of space is valuable. We have before commented on the want of taste exhibited by the Corporation in erecting the memorial so near the New Law Courts, with which it will contrast violently, and at great disadvantage so far as style and architectural merit are concerned. If a refuge to foot-passengers at this junction of Fleet-street and the Strand is necessary, Mr. Street's proposal to erect a bridge should have been adopted and the recently-widened roadway not once again encumbered with a needless obstruction to traffic.

The Lamey prize of the University of Strasburg (2,400 marks, or about £120), is to be given for a dissertation on the "History of City Architecture among the Greeks" (Geschichte der Städtebaukunst bei den Griechen). Antique literary and epigraphic sources are not to be exclusively drawn upon, but the results of excavations, etc., are likewise to be made use of. Such parts of the subject as may appear to have been sufficiently treated elsewhere, may either be omitted or summarily treated, reference being made to the works in question. The literary style must not be of an exclusively scientific character; the general results at least must be given in a readable and easily comprehensible form. MSS. must be sent in to the Secretary of the Senate of the University before Jan. 1st, 1884; the prize will be awarded May 1st, 1885. All nationalities are admitted to the competition, and the dissertation may be written in German, French, or Latin. Each MS. must bear a motto, and must be accompanied by a sealed envelope bearing the same motto, and containing name and address of the author. Any departure from these regulations will involve exclusion from the competition. Only the envelope belonging to the accepted MS. will be opened. The rejected MSS., or those excluded, cannot be returned.

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 10, 1880.

THE MUNICIPAL BUILDINGS DESIGNS, GLASGOW.

THE decision arrived at with regard to the Glasgow Municipal Buildings designs seems to have disappointed many, and this feeling appears to be entertained, not only by the competitors, who have bestowed an immense deal of labour and thought to render their designs worthy of the town, but also by the majority of the town council, who, at their last meeting, on Thursday week, expressed a strong opinion in favour of securing the best and most worthy design, irrespective of cost. Mr. Barry qualifies his decision by saying that there are other designs sent in for competition "superior in merit to those selected for the premiums," but that he was bound by the instructions issued limiting the cost of the buildings. It seems, indeed, pretty evident, by reading the referee's report and letter, that he felt his task an unsatisfactory one, and was not particularly pleased with the manner in which he had performed it; and in attempting to follow his "embarrassing letter of instructions," he has, as he himself admits, disregarded those designs which his unfettered judgement would have approved. Even those he has selected are only a degree less expensive than the others, and their authors, if they could see their designs executed, would acknowledge the value of further embellishment, in the way of marble and internal decoration. Mr. Barry's letter, the purport and publicity of which became a subject of discussion at the council meeting, clearly places the above view of the case beyond doubt. He there says that, on considering "the space to be covered by the buildings, and the character which they ought to bear, his opinion was, that a much larger sum than that specified would be required. He goes on to say, in substance, "if, after payment of the premium, the council should feel disposed to reconsider the question of the designs, apart from the question of cost first fixed, he would be prepared to advise the corporation." In fact, Mr. Barry, in his report, admits the "impossibility of obtaining any building of a suitable character for the sum of £150,000 named in the instructions"; and we quite agree with him, that a fair price per foot cube of the buildings, as defined on the plan supplied, would cost not less than £193,000. But to meet the instructions, which named the first sum as the limit, Mr. Barry has felt himself justified in reducing his figure to it, and a rate per foot cube of 9d. for the main building has been deduced accordingly; a price, as every architect knows, quite inadequate for a structure of such complex arrangement and character. Such, in brief, is the result of the parsimonious dealing with the matter. Comment is needless, and we are sorry that Mr. Barry did not at once see the advisability of boldly declining to accept the responsibility of a selection of designs under such conditions, namely, of making the cost the test of merit. But we give elsewhere, *in extenso*, Mr. Barry's report, from which it will be seen that he would, if left free, have adopted other designs, the cost of which would range from £180,000 to £250,000.

Two obvious mistakes were made at the outset by the Town Council: the first was the restriction of the area set apart for the building, and the second the adoption of a set plan, which gave the competitors no scope for the proper grouping of their buildings. The instructions also limited the architects as regards height, and did not take into sufficient regard the due separation of the official from the reception apartments; more particularly we find fault with the portion assigned to the town-hall, and the means of entrance and exit; the corridor arrangement; and, not least, the very disagreeable proportion of the offices, many being 30ft. by 14ft., lighted from one end only. As regards cost, the competitors have been misled by discussions in the Town Council, from which it was inferred, the sum fixed upon was not likely to be rigidly regarded as the limit.

Our remarks on the designs will be necessarily brief, as no less than 96 are on view, and we may confine our criticism, therefore, to the elevations, as the plans are not accessible in many cases, and the authors appear to have followed the sketch plan in the main. The designs comprise every variety of Classic, from the severer Greek or astylar forms to the more florid types of the Roman, Venetian, and Renaissance, and they differ as much in their manner, from dignified congruity to feebleness and commonplace. To commence with the three selected designs: "Carton," by Mr. Geo. Corson, of Leeds, seems to have, in some respects, improved on the sketch plan; there is a decided improvement in the staircase arrangement, which is better lighted, while the quadrangle entrance forms a loggia, and the communications are more architecturally managed, while the saloons and town-hall are arranged with a view to their combined or separate use. The principal floor retains the position marked out for the city hall, the council chamber, corporation offices, gas and water department, &c., and as regards their relation we may at once observe Mr. Carrick's plan might be safely followed in the main, except as to the location of city hall, which ought to be made an external feature. On the second floor we have the saloons in front, towards Cochrane-street, the Dean of Guild Court, also the offices of public works, the lands valuation offices facing John-street. Mr. Corson has adopted the Palladian style, the reasons for which he gives in his elaborate report, chief among them being it is more dignified and more varied than the Roman. The elevation towards George's-square bears an official character: a lofty tower (not a dome) with open-arched belfry, and a high-pitched cupola forming the centre, at the corners of which are small octagon turrets. The façades have three tiers, of three-quarter columns of the Corinthian order; between them are circular-headed windows, and a chief feature in all the façades are angle piers with niches for statues. There is a too striking similarity or repetition of parts in the elevations (a characteristic of Palladian) to enable us to say the design is either grand or striking in its *ensemble*, and the only variations are the towers and *Mansard* roofs. These are varied. Towards George-street the tower has a low centre dome. Towards John-street there is a lofty tower, octagon above, with a conical-shaped roof, and the one facing Cochrane-street a tower with flat roof. On the whole, the design is coherent and satisfactory in its massing, though, if one may compare, scarcely equal to the author's offices at Leeds. The author estimates it at £150,432, a sum undoubtedly low. The drawings are boldly inked in. "Fidelity" (Messrs. Coe and Robinson, of London), awarded the second prize, is much more ornate in design. The type chosen is rather Roman than Venetian, the tower, with cupola and clock set back from the front. There is a pediment to the west front, and also wings, and the treatment consists of a Corinthian order set upon a basement with flat roofs. On the north and south sides the elevations suffer from the narrow pedimented centres over entrances. Looking at the plans we find little or no alteration from the Corporation's suggested arrangement, but great labour has been expended in showing the ceilings of the chief apartments. No estimate is given. "Let Glasgow Flourish for Ever," the third design (Mr. Edward Clark, Adam-street, Adelphi, who, we believe, sent in two sets), has a grand imposing front to the square, with a dignified and well-proportioned dome in the centre, which is supported at base by angle cupolas. There is a columnar order on a basement, a low pediment in centre, and attic above. The George-street and Cochrane-street façades are relieved by pedimented centres, and the columns are coupled. The west front is Doric below, with Corinthian coupled columns above. The estimate is £143,728.

We now proceed to notice a few other designs, which possess merits of a higher order than either of the above, but which have, for the reasons stated, been set aside. Two or three of these have won well-merited praise. We first allude to a design conceived in a French Château or Renaissance style, under the motto "Spes Dulce Malum" (Mr. John Burnet, of Glasgow), undoubtedly one of the ablest in the collection. The high, château-like roofs make one of its most striking features, and contrast rather pleasingly with the more Classic or Academic models which abound. The drawings are rather faintly lined, but indicate a master's hand in the detail. Towards the Square is the town-hall, made a central feature between the windows of which are columns supporting statues, relieved by an attic. It is crowned by a steep roof, out of which rises a small bell-turret or cupola. The plan seems to be much altered. One of the alterations is the entrance vestibule in the axis of George-square; this is made more imposing by a row of disengaged columns, and beyond this is a grand central staircase, lighted from a domical ceiling. An alternative design, in a severer form of Classic, distinguished by a Greek feeling in the detail, is shown; it has a centre portico (tetrastyle), with a dome over of plain design, and the superstructure is raised on a double basement, the lower portion of which is rusticated. Some clever decoration is drawn in the sections of the town-hall and saloons. Great John-street elevation has a pleasing Florentine character. We might find fault with one detail in the first-named design, namely, the broken frieze between the upper windows, and, on the whole, we must confess the Renaissance is not exactly the style to adopt at Glasgow.

"Aiblins" is decidedly an able and well-balanced design, and stands high; it is by Mr. James MacLaren, of King William-street, London. The elevation to George-square is well massed, and dignified in character, and the grouping of the centre, with its pediment and flanking-towers and dome, is striking and satisfactory. The author says, in his description, he has founded his design on the type of the Italian palaces worked out in the flexible manner of the French school. The wings are pronounced at the angles by square columnar compositions of the Corinthian order, and are crowned by low domical roofs, while the intermediate wings have a lower interfenestral order, with circular-headed windows between, on the main story, above which is a smaller range of windows, with panels occupying the intervening spaces, and a low frieze or attic, the whole resting on a rusticated basement. The elevation to George-street presents an agreeable variety to the last: the long centre, with its high roof and row of niches and figures, and the attic over, contributing to the effect lent to produce it; the author has wisely shifted the city hall from the angle, certainly an objectionable position for a well balanced structure, and placed it in the centre of façade, where it becomes a dignified and pronounced feature. Other deviations have been made in the plan, one being the entrance-hall, which may serve as a crush-room, and this part of the plan has been remodelled in a manner which is worthy of the council's attention. Generally the elevations express the semi-official and public character of the building. The author has honestly expressed his opinion that the sum provided is totally inadequate, and with this we fully agree.

"Civis Sum" (Messrs. Campbell, Douglas and Sellars, we believe) is an elaborate set of well-drawn elevations in ink; the type selected is of a more florid Roman kind, the principal front is well balanced, and the arrangement of central portico dignified and striking. There is no pediment, but the portico has coupled columns between plain rusticated piers, which carry small cupolas, and sustain the centre. The ends are well managed, and the single order embracing two stories is here worked out in an unobjectionable and not too pompous manner, though more expensively than the last-named. Sculptured subjects appear in the semicircular recesses above the principal windows, and groups are placed at the ends and figures on pedestals over portico. The columns are disengaged from the recessed wings containing the saloon and library. In the John-street elevation corner cupolas flank the composition. In the plan the authors have made several alterations; the town hall is placed on a central axis of first floor east and west, dividing the quadrangle into two parts. There is an octagonal entrance-hall, with vestibules filling up the front corners, and the grand stairs is arranged with circular ends and in good communication with corridors. By this means ample light is got, and a covered porch is shown. The council-chamber occupies the east side of south quadrangle, is lighted from front, while the general grouping of parts is improved, and the plan is rendered symmetrical. The hall is 105ft. by 55ft., and is lighted by windows placed high in the side walls, and through the roof. The plan is too elaborate, and would perhaps better suit an ideal Academy design. "Palladian," a design by Mr. Stark, of Glasgow, is a solid and striking composition in many of its features; the square angular masses, the single order of fluted columns, rising from a low podium, and the centre facing George-square, are dignified. Enrichment is obtained by sculptured groups in front of attic story of centre, and by a richly sculptured tambour to the dome in relief. The dome stands on a peristyle, and forms a centre feature of good outline. The design under motto "Progress" (Salmon and Son), is conceived in a bold Roman style; an order of Corinthian columns, occupying the principal story, including panels for sculpture, stand upon a plain basement, the ends are crowned with lofty Mansard roofs, and there is a large octagon dome in the centre. The authors show a clock on the front face of dome, and there is a deep pediment filled with sculptured figures. The John-street elevation has a French cast in its features, the pilastered centre between the small pediments and the attic of this portion break up the elevation, and the Mansards assist the effect. Less happy is the narrow centre with its coupled columns, over the George-street entrance. The quadrangle elevation we like best of all. The printed description accompanying "Progress" is well illustrated with the principal elevations of the façades. In the planning, Mr. Carrick's scheme has been followed. "Classic," in pencil, is another design in which effect is obtained rather by dignified grouping and judicious sculpture, than by elaboration of parts. There is a portico towards the square. An alternative elevation shows a lofty tower instead of dome, in five stages, preserving a pyramidal outline. The proportions are good, and the side façades have centre cupolas, though very differently treated. The sculptured groups and friezes exhibit taste, and the work is generally refined and varied in its detail. "Comme il faut," a design of clever character, Thomsonian in style; the centre tower is crowned by a plain cupola, octagon below, with square pedimented base, springing from roof. There is a columnar front of two stories, crowned by a pediment, and the detail also is thoroughly Greek in conception. "S.P.G.G." is the motto of an extremely neat set of drawings with Classical features, but spoilt by small detail and poor proportions. "Athens" is another Greek treatment, without tower, a flat roof, and a little too severe. The George-street front has a pediment, and attic over, and the design is refined in parts; but the plan follows closely the suggested arrangement with all its defects, and we see, as we do in many others, the lavatory retained between reception-room and saloon, with window between the columns of main façade. "Light" shows a well-balanced elevation, with pilasters, attic, and dome in the centre; the angle treatment is sensible, and the town-hall is emphasised. The suggested tower to John-street is slender, and does not add to the dignity of building. "St. Kentigern" (Mr. Hill, a local architect) exhibits a quiet treatment, dignified in the elevation, and imposing in its breadth and massive character. It is essentially adapted for granite. The George-square elevation is impressive, but refined in detail; Doric columns of Roman type stand on a plain rusticated basement; the centre cupola is supported by side turrets, with caryatides in attic carrying a pediment. The Cochrane-street elevation is plain, but striking. "Bannockburn" is an able design, French in spirit, and the detail rather Florentine than Roman. The Town hall is made a feature by higher roofing. The dome towards George-square is octagonal and heavy, and, like many others, is set back over the staircase; the drawings are ably executed. Two Concentric Circles is also a design in a Renaissance spirit, characterised by a breadth and almost bold simplicity of treatment, that affords a striking contrast to the tawdry finery and vulgar grandeur of some near it. The town-hall is emphasised by a richer handling, and the decoration is confined to this part and the doorways. No roof is visible, and the dome is disproportionately depressed. "Ca Ira" is, on the contrary, extremely ornate Italian. There is an order of columns (Corinthian) on a basement, and a portico whole height of front façade, and domical roofs at the corners. The design is too palatial, and not official-looking enough. "Quivi trovammo" is another palatial Italian design, with a low order and coupled columns in attic; there is a domical tower, with angular turrets and high roofs, and the composition is well massed. "Bruce," in a semi-Palladian style, has no dome; the roofing is not made a feature, being quite flat, and the whole is severely simple, and scarcely dignified enough. "Lapides Loquunter" is able and characteristic; the front is broken up by alternate bays with attics filled with sculptured relief in panels, and a lofty tower and angle cupolas adorn the main façade. The great hall is externally expressed, and the author, Mr. T. Lennox Watson, of Glasgow, has shown how effect may be obtained with local sandstone in an inexpensive manner. "Centre of Commerce" is an astylar composition, Florentine in manner, with good detail, pedimented windows on chief sides, and the ends relieved by corbelled bay windows, and finished in a pleasing manner. The hall is marked by a higher roof, and by four angle cupolas. The quadrangle elevation is one of the best, and there is a circular cupola to main front. "Ca Canna" (by Mr. Boucher) is a plainly-treated Italian design, lacking in dignity, perhaps, though pleasing in detail of entrance and attic story; the decoration is confined solely to the cornice and upper portion. Palladian designs there are several, but few cleverly worked out. "Simplex" is one in this style of Italian. Good outline and some other points strike us in "Art with Economy," which is a composition without columns, or at least its author makes no parade of them; the hall is pronounced in the position assigned it, and the detail, if bearing evidence of refinement, is rather heavy. There is a domical roof over hall, and the work is decidedly French in feeling. In the design "City Chambers," by a local architect, a rather lofty centre composition, crowned by a dome behind it, appears; the angles have high roofs, but we cannot justify the large columns in centre over lighter ones below. The former want a base. "Ad Rem" is a remarkable design. The author shows a curious tower in centre, and the George-street façade with an Ionic single order of Greek character. The narrow pedimental centres and the two longest faaçdes, and the John-street side, with its end pediments, scarcely add to the effect, "Nisi Dominus Frustra" is impressive in the Thomsonian spirit, which is carried to excess, and the hall is pronounced. The Ionic capitals are a little too Assyrianised. Of other designs we can only speak generally. "Speedwell" and "Finis Coronat Opus" with pencil underneath written "Non Nobis Solum," are rather extreme instances of Classical composition. The former, in its John-street front, makes a very narrow pediment, while the last glories in a Roman portico which appears to crush all below it, and is rather too ambitious in style. "Royal" spoils his dome by clock gablets, and renders it heavy. "Why Not" is a massive composition, with Palladian features. The lofty tower and octagon cupola rises above a roofless structure. "Crescent in Square" adopts a very ornate and flexible style of Renaissance; the lofty campanile, upwards of 200ft. high, and the façade have a touch of Moorish or Venetian character, and the author has made one external feature of his hall. "Alcyone" adopts French Renaissance. He has a sculptured attic above pediment, flanked by two cupolas, with a slender tower on north side of quadrangle. "Let Glasgow Flourish" is the motto of two designs, both of the ordinary type, and the "Arms" of Glasgow is the motto of a Roman design, the only noticeable feature in it being a square tower-like mass with octagon cupola above and angle turrets; the keystones of upper windows are too heavy, and a want of coherency exists in the George-square front. "Experto Crede" is rather Schinkelesque in manner; there is some neat drawing, but the main front is cut up by small pilasters and curved spandrels. "George in Square" is massive in outline, the dome is low, and there is some breadth of wall-surface, which many architects despise or underrate. These are its chief features. We have merely space to enumerate the mottoes of "Desideratum," "Clyde" (a good drawing, but too broken), "Defficit pecunia defficit omne," "Experience," "Town Hall," "Our will became servant to defect, &c." (a free monolithic rendering); "Pen Non Domine," "Apropos," "Light and Shade," "Salonica," "Conor," "Immutatus," "My Mark," "Non quo sed quo modo, and red cross," "Con amore," Concordia et Fidelitas," "Lippen to me, but look to yourself," "Nitor," "Roman," "St. Mungo," "Festina lente," "Clutha," "Intersecting triangles" and "G, Revirescum," "Suum Cuique," "B in Circle," "Justice and Sword," "Civis," etc., many of which are neat and effective drawings, but either too florid or grandiose or defective in composition and proportion. We hope the Council will ultimately select a design in which the last-named qualities are conspicuous; the façades should be in a dignified style—that can be suitably expressed by the local sandstone—and pleasing proportions and symmetry require to be observed in any design which is to associate or compete with the buildings of George-square; above all, the structure should be worthy of Glasgow, which already possesses not a few ably-conceived Classic edifices. It is not yet definitely known what the Town Council will now do in the dilemma into which they have fallen, and which we predicted long ago, although there is a feeling among some of its members to set aside all the designs and employ an independent architect. Such a course would be not only unwise, but unfair towards those competitors who have produced designs worthy of the city. Whatever is done, the people of Glasgow should first make up their minds exactly what they want and what they are willing to spend to get it; when these points are settled, they may proceed to consider the advisability of entrusting the work to the architect whose design is pronounced the best among those submitted in the recent competition, irrespective of the old limits as to cost; or they may arrange a new competition limited to such of these architects as lately competed, or may be selected, and may choose to compete again. Whatever may be done, we do not think the competitors have been fairly treated, either by the Town Council or their professional referee.

THE FINE ART EXHIBITION AT BRUSSELS.

If the fine art collection now to be seen at Brussels is of less importance than the larger and more extensive exhibition at the Trocadero in 1878; still, considering the smaller size of the Belgian kingdom as well as its lower place in point of wealth and power to the great French nation, the public and private contributors to the success of the present collection are to be congratulated for the general interest of all that is to be seen in the 4th section of the Exposition Nationale of 1880.

The objects exhibited are at present divided into five classes or sections. A contains Metal Work; including iron, gold, silver, and especially, as might be expected, latten or yellow bronze. In it are also to be found ivories, and other ornamental articles of virtu and luxe. B contains Furniture; F, Tapestries; G, Coins and Medals; H. Manuscripts and Books. Many of the articles lent by the various ecclesiastical and municipal bodies are of the very highest order. It is well to observe that some of the sections contain other works besides those indicated by their titles, and that sections B and H, are only partly complete. This is a great pity, for the catalogue as far as it goes is very full and instructive, and in most cases accurate.

When we say that A contains 2615 items, our readers will have a faint idea of the importance and exhaustiveness of the section. In latten and iron there is no end to the instruction that our art workmen and artists might gain. All is true—much quite as simple and apparently easy as it is true, but still such as we seldom now see. We shall not have space to particularise as much as might be wished all that is most worthy of admiration; but we are bound to notice certain typical pieces, and, in passing, we wish to impress upon our readers one very needful lesson; which is that, *pace* the Pugin and Mechanico-glyptic school, there are at least two legitimate modes of treating metal, each in its way capable of carrying out all that the mind of really fine artists wish to be effected. It is ridiculous nonsense to object to the most natural process of melting and casting any metal. Some of the finest works in the world in all time have been cast—many of them must of necessity have been cast. Metal stamped by machinery and tinkered up afterwards, intended to pass for honest hand-work, is a simple attempt to falsify facts, and will tend more than anything else to degrade fine art in metal. If cost is an object, more attention should be paid to a real and true use of the most natural mode of treating most metals. In Belgium, at least, where we have so many famous examples of hammered work—and it may be remarked, in passing, that they still produce admirable specimens of this difficult art—difficult if more than mere twisting and stamping is concerned—some of the most interesting pieces were cast; one especially good example in iron is a pair of fire-dogs of the middle of the 15th century, No. 2360, of good Gothic design. Of course the best of the wrought work is, except usually in the case of statuary, superior and more artistic than any of the cast iron. The examples are endless. We have gridirons and other culinary implements, some admirable for their natural ornamentation. No. 2351, a fireback of the year 1546, gives a full representation of a kitchen, which exactly explains the use of many of the actual utensils in its neighbourhood. The various churches and archæological societies exhibit fine candelabra and crowns of lights. No. 2354 is perhaps the best thing of this kind. The funeral candlesticks, No. 2389, belonging to the church of Notre Dame du Sablon at Brussels, of the 16th century, are remarkable for their extreme simplicity and good taste. No. 2416, belonging to the Ville de Diest, is one of the most curious chandeliers. It is composed of stags' horns, joined together with wrought iron, in the form of a fortified town, and dates from the end of the 14th century. Marriage and other coffers occur in considerable numbers, some entirely covered with iron or steel; some beautifully ornamented with painting and ironwork. Nos. 2439 and 2445 are good specimens. Against the walls and pillars hang glazed frames containing an infinite variety of smaller pieces of metal work, all showing how well the art was carried out as late as the 18th century. Keys and locks show their usual excellence of workmanship. No. 2381, which once belonged to the Hotel de Ville at Mons, is a masterpiece; pinnacles, crockets, pierced work, and figures, in absolute perfection. Better still, in fact as fine as it is possible to imagine, is No. 2279, a magnificent lock of the 13th century. Almost every conceivable implement is represented in this exhibition—knives, keys, hand-saws, turnscrews, flat irons, rasps, and graters—mostly with some good decoration about them. Nos. 2342 and 2350 are especially beautiful specimens of later work, the latter bearing the date 1686. They are mirror frames ornamented with natural flowers. Liege sends some fine door-hinges of early date.

The latten work is almost as extensive and interesting as the iron. The largest and most important specimens can, naturally, only be seen *in situ*, as they consist of huge gates, grilles, and other fixtures. The Church of St. Jacques à Louvain, however, has sent a fine grille, formed by a series of columns surmounted by statuettes and candelabra. Its value is increased by having a date, 1568, and its founder's name, "Ian. Valdener me fecit." A fine well-preserved and highly-coloured funeral brass is exhibited by the Museum of Malines. There are many fine lecterns in the shape of eagles or pelicans, &c.; Pascal and other candlesticks, the finest of which is No. 452, a very noble work; Nos. 890 to 895 of the 12th or 13th centuries, and most valuable and interesting; processional crosses and other articles for church purposes; but the most numerous section is of things for domestic use. Baron de Vinck has collected an amazing number. The mortars of the 16th to the 18th century are among the more interesting specimens. There are more than a hundred of them, the earlier ones of the middle of the 16th century being highly decorated and often with admirable designs. The utensils in the form of grotesque men and animals are very amusing and clever.

Of more precious metal work there is a grand collection. The plate from the 16th to the 18th century is superb. Nos. 945 and 948—Ewers and basins of *repoussée* and chased silver gilt could scarcely be surpassed. The folly of restoration—in fact, the absolute destruction for any useful artistic purposes—is shown in a few of the choicest cathedral and church treasures. Happily, most of the precious early Christian works have been religiously and faithfully preserved. No. 52, Châsse de St. Ghislain, belonging to the church dedicated to that saint, has been made up of two châsses, one of the 12th and the other of the 13th century. They must have been once of great value. There are six large plaques and twenty-three small ones; but by rearrangement and almost total renewal little of the value remains. There is one good piece of Merovingian work, No. 82, a fibula belonging to the Church of Notre Dame at Tongres. It is of the usual character, the cloissons being filled with pieces of emerald and ruby. No. 49 is a leaf of a very early diptych in ivory, representing one of the Evangelists holding up one hand in blessing, and having a book in the other. It is similar in workmanship to the ivories on the celebrated chair preserved at Ravenna. It is said to be of the 6th century, and is inscribed on the back with the names of the Bishops of Tongres, who lived at Liege from the year 840 to 956. The cathedral of Tournay contributes a splendid diptych with pierced background, of the beginning of the 9th century. The chief subject is the usual representation of the Crucifixion, the feet unsupported, not crossed, but with separate nails. On the right hand stands a female denoting the Church, catching the blood in a chalice; on the left, another, symbolising the Synagogue (Hierusalem), with her head turned away in unbelief. St. Mary and St. John stand on either side next to them. On the second leaf there is a portrait of SCS NICASIUS, EPSP. This beautiful ivory is worthy of close study. Mgr. Ponceau is the possessor of a very rare and complete reliquary coffer in ivory of the twelfth century. Under an arcading are full-length standing figures of Our Lord, the Apostles, and Moses and Aaron. Among other priceless treasures, the Cathedral of Tongres exhibits one of the finest covers to an Evangelarium that we have ever seen. It is of thick wood, covered with plates of silver, partly gilt, and beautifully inlaid with precious stones. In the centre is our Saviour, between St. Mary and St. John, the sun and moon above on either side of the cross—jewelled with a carbuncle and a pearl. At the foot of the cross is an amethyst. The border is studded with precious stones and ancient classical intaglios, one representing the head of Medusa, another Bacchus. There is also a Byzantine cameo. It is impossible to give even a faint idea of the exquisite taste, skill, and fancy of some of the filagree work. Among the beautiful scroll ornaments there are life-like figures of huntsmen, dogs, stags, and hares. The outer border is ornamented with niello pictures alternately with plaques of similar filagree to the inside one. The name of the author, who is represented on his knees, offering his book to the Saviour, and St. Nicolas, the patron of the Abbey, is inscribed in niello + Liber: Scriptus: intus: et: foris: Hugo: Scripsit: Questu: foris:

manu : + Orate : pro : eo : + Ore : Canunt : alii : Cristum : Canit : arte : fabrili : Hugo : sui : questu : scripta : laboris : arans. The date of this superb book is of the 13th century. There are two other works by this great artist, also showing exquisite taste. No. 138, a reliquary, belonging to the Abbey of Oignies ; and No. 137, also a reliquary in the form of a foot. There are three other bindings of the Gospels close by of the highest quality. The side of 314 is occupied by a 9th-century ivory, of singular power and beauty. It forms part of the rich treasure of Notre Dame at Tongres. There is in it a curious admixture of Classic and Christian ideas. The sun and the moon are represented by a man and woman, each lamenting the crucified Creator. At the foot of the cross is the resurrection of the dead ; on the right is the earth, represented by a half-nude female suckling a serpent, and holding a tree in her left hand ; and on the left side the ocean is represented as a bearded man, holding a fish in his right hand and an urn in his left. The rest of the cover is of later date. The next best has no number, but belongs to the Administration Communale de Liege. In the centre there is also a fine 12th-century ivory of Christ, in a vesica, supported by the four evangelistic symbols. Surrounding this are most spirited enamels, really champlevé, but cut out so as to look like cloisonnée—*i.e.*, the cloissons are not soldered on, but left by the chisel. The figures represent the rivers Pisou, Geon, Tigris, and Euphrates, with Temperance, Fortitude, and Justice, separated from each other by elliptical ornaments of engraved copper-gilt, which have unfortunately been regilt. We have seldom seen such life and vigour in any mediæval enamels. The book bears the inscription : "En ego Notkerms peccati pondere pressus, ad te flecto genu qui terres omnia nutu." The enamelled chasses of the 12th and 13th centuries are numerous, and many of them fine.

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INDUSTRIAL EXHIBITION AT THE ALEXANDRA PALACE.

LAST Saturday an Industrial Exhibition was opened at the Alexandra Palace which may be looked upon as the inauguration of a new scheme of exhibitions for the working classes, arranged on a more complete plan of organisation than some recent ones we have had to record. The exhibition is held in the Banqueting Hall in the Park, where every facility has been afforded for the exhibitors, and many of these by name are known to us as having contributed articles to the late Bow and Bromley Institute. The rules and regulations are few and simple ; only members of the working classes can compete for prizes, and every article so contributed is to be the work or design of the exhibitor. The articles are to be brought and removed at the exhibitor's own risk and expense, and medals and prizes to the value of £200 are offered for competition in the various classes. Special prizes are to be given for new and meritorious inventions. Besides the exhibits sent in for competition, a great many others have been contributed of an instructive and useful class. In the mechanical section are arranged a variety of classes, including, cabinet work, inlaid work, turning, carving fretwork, furniture, coopers' work, musical instruments, models of buildings, steam-engines, ships and boats, carriages, &c. Many of these are works of design. In class 1 we find a variety of inlaid work of unusual excellence in workmanship, and some of the exhibits bear evidence of artistic design. No. 2, a walnut fireplace, decorated with satinwood border panels, by J. Beauchamp, of Gray's Inn-road, is a neatly designed piece of decoration ; the painted or stencilled ornament in colours in the light wood borders round the mirror make a pleasing and simple kind of relief, and the design of the grate-front is in good taste. Mr. Holdom, of Victoria Park, shows a creditably executed suite of bed-room furniture ; and the inlaid clock-case exhibited by J. Morrison, of Harrow-road, is noteworthy as a pleasing design in the style of the Adams. In the same class we notice inlaid boxes, carved brackets, timepieces, frames, and various carvings by F. Smith, W. Hill, S. Watson, H. A. Elliott, A. Devereux, Hicks, and other exhibitors ; but special praise is due to Mr. W. Clayton, of Wardour-street, for his admirably designed and executed inlaid tablets of the Decalogue, in which various woods have been combined with good taste. No other marqueterie work comes up to this.

In wood-carving we take particular notice of an oak eagle lectern, designed and executed by T. T. Wilson, of Pentonville road. The base, formed of a group of buttresses, is well proportioned, and the detail in good keeping. The photographs of church furniture executed by the same artist are all in correct Gothic feeling. The wood-carving in the Adam's style by G. H. Ball, the brackets, and fretwork in this class also deserve a more particular notice than we can give here. H. Deeks, of Essex-road, Islington, deserves credit for his block of wood carved with the Lord's Prayer ; and the walnut cabinet door-panel by H. Cooper, is an excellent piece of work. A case of musical instruments consisting of banjoes, banjo-lutes, guitar-lutes, &c., is exhibited by S. W. Kemp, of Kingsland-road, many of pleasing designs ; and another case, by a gardener by the name of Gannet, is interesting.

Models of steam-engines occupy, as usual, a very large space in the present show, and ingenuity in this form is a prominent and well-deserving feature of industrial exhibitions. It would be wearisome to the reader to give half the names of the principal exhibitors of this class ; suffice it to say, that nearly every kind of mechanism is shown, and the exhibitors are men and apprentices of various occupations. An engineer's apprentice, R. Nasmyth, is credited with the original design for a horizontal engine (86), certainly an admirable piece of workmanship ; and the models shown by Jas. Ellis, of Offord-road ; W. Maples, Stratford ; Hedley, Kent ; J. Curzon, Tottenham ; R Arkwright ; G. E. Lacey, &c., especially call for mention. A working model of a compound surface condensing engine, by T. Coates, is a marvel of neat workmanship. Here, however, we may more specially draw attention to a few exhibits of an inventive kind. We note a new patent hydrostatic ball valve for cisterns by E. Skitter, Hackney, the main object of which is to prevent leakage, so that the pressure of water, however great, may, instead of forcing the valve to open, assist to keep it closed. The principle of the invention is a good one. King's patent shaft-coupling for repairing propeller-shafts at sea, is certainly deserving of attention by the marine engineer. The same exhibition shows a self-acting drying-closet, an apparatus for preventing persons falling between trains and the platform when the former are in motion, a safety-lift having a ratchet catch so as instantly to arrest the cage. A compositor, F. A. Gay, exhibits an automatic fog apparatus, and W. Elliott a self-acting railway-signal post. We also see an improvement in screw-down valves and fire-annihilators. Some of the exhibits we have seen before at the Bow and Bromley Institute, as Earnshaw's chronometer escapement, and Harold T. Granger's improved tramway models, the latter a great improvement on the present system. S. Morgan, a carpenter, shows an ingenious way of making an elliptical staircase self-supporting—we presume the name "Elyplical," as printed in the catalogue, is a misprint—and we have in this class an abundance of inventive skill and energy, from models for bicycle brakes to the "early-riser's friend," by C. M. Walker, an apparatus combining an alarum with a striking of a match, lighting of lamp, and making coffee. J. Knight's improved spreader, or rose, for watering gardens, is decidedly an improvement upon the old rose, and we must not forget to mention some useful improvements on fire-escapes by W. Parker (class 13), of Dean's-yard, Westminster, by which the wheels of the escape may be secured by simply letting go chains which release blocks which drop under the wheels. Another suggestion consists in a simple means of making the escape stand by itself without the aid of strangers or without resting it against wall of house, both valuable improvements on this useful machine for saving life. Models of ships and boats are clever, though the exhibition misses the collection of valuable models of steamers, &c., lent by some of the leading companies to the Bow Exhibition. The exhibits in these departments have been well classified, and much is due to the arrangements of Mr. J. S. Cooke, the secretary. But we pass on to notice the more artistic sections of the exhibition, and here the first word of praise is due to the large and, in many respects, admirable collection of decorative paintings on china, glass, and terra-cotta, exhibited by Thomas Cox, of Southampton-row, Russell-square, to whom, in a large measure, the decoration of the present exhibition-hall is due. In our recent notice of work in the Bow and Bromley Exhibition we mentioned a variety of painted china and terra-cotta, of exceedingly good design, and the same enterprising artist has enhanced the present exhibition by a large display of terra-cotta, painted china, and stained glass, which form an art-exhibition of themselves. The raised enamel painting on terra-cotta, especially in several of the vases and plaques, has a particularly rich effect in some of the conventional designs. One peculiarity of the china painting is that it is painted on the glaze and then fired ; some of the plates and vases painted with fuchsias, ferns, geraniums, &c., are excellent. The plaques, by apprentices of Mr. Cox, exhibit invention and taste ; we especially draw attention to some in the upper gallery, showing conventionalised outlines of foliage, &c. Painted tile decoration is another branch in which the exhibition is strong, and we notice several pleasing efforts at wall decoration in which conventionalised birds, fruit, and foliage are introduced in blue and other colours. The stained glass exhibited by Mr. Cox adds much to the effect of the clerestory windows of the hall. We may draw attention to some staircase windows, by an apprentice, aged 17, of the name of Stacey ; another light, "designed, coloured, cut, and glazed" by W. J. Duncan, also a youth ; some medallions by a boy aged 16 ; and some capital arrangements of glass in leaded patterns, in which flat colouring and conventional or geometrical designs are shown. Artists in glass and tile work, particularly those who benefit from these exhibitions, are indebted to this collection for the examples brought together. In other artistic exhibits in terra-cotta and stone, Henry Gunthorp, of Herne Hill, J. Curtis, of Kentish Town, W. H. Caddy, of Brighton, may be named. The mosaics, inlaid marble, and woodwork are represented by performances which only need art education to render perfect. Thus we may take Mr. C. Clay's inlaid marble table (224) ; another by J. W. White, containing 7,000 pieces of wood, as instances. The models of buildings are not of great excellence ; we notice among the best a large model of St. Paul's Cathedral in cardboard, by C. Rochfort, a police-constable, Bow-street, executed with much taste and care, and with the proportions carefully preserved; the model village, by a schoolkeeper, is less intelligible; and the model of a cathedral front in shells, Hackney Tower in sealing-wax by a warehouseman, and other efforts of a similar kind, are instances of misdirected energy and perseverance that might be put to even better use. Designs, architectural and mechanical, are certainly higher in motive; they imply invention, though very many of them show that a knowledge of art principles has yet to be implanted. A design for a school by a carpenter and joiner (Woodley), designs for a greenhouse by E. Pennington are creditable in their way, and are valuable as showing improvements. In the same class we note designs for linoleum by a merchant's clerk, designs for tapestry curtains, embroidery; decorative designs, drawings of timber roofs and iron bridge construction, by Francis J. Bancroft, of Holloway; architectural designs by J. Chamberlain, Limehouse; and a painted panel of silk, with some spiritedly-drawn figures, Terpsichorean in character, in good colours upon a rich yellow and citron ground, by W. G. Barker, of Tufnell Park. It is intended for a pianoforte front. Other glass panels by the same artist are clever in conception. The decorative painting on glass, &c., by G. Sears (of Lisson-grove), by J. H. McLeman (Upper Holloway), T. Goldfinch, S. Rice, Maud Hepworth, S. Rogers, and D. Graham are interesting as showing various motives and ideas. Graining and marbling, illuminations, &c., form other classes of art work into which we cannot enter, though many of the exhibits are highly creditable to their artists. Looking at the oil and water-colour drawings we cannot say very much, though some good work is to be seen. In both classes Nellie Dwelly, of Bow-road, carries the palm. The flowers, No. 259, &c., show talent; and in the water-colours we notice one or two of much feeling and good colour. In the oils, Nos. 268 and 284, by C. Western, a coachmaker; No. 305, a head from life, by A. H. Winks, Islington, display talent; but we are sorry such caricatures as the likeness of Lord Beaconsfield should have been hung. Nos. 265, 266, by G. C. Blatchley, a few signed H. P. Truman, letter-sorter; "Burnham Beeches," by F. W. Lascelles, and some by Noble, claim notice. In the water-colours, Miss Dwelly, J. R. Dunning, F. W. Lascelles, and J. C. Banks, are the leading names. The foliage of J. R. Dunning and F. W. Lascelles is vigorous; and the sketches by J. C. Banks are marked by feeling. With these exceptions, the collections hardly equal the other classes of the exhibition; many are crude and coarse drawings in colour. We can only afford space to notice in commendation the excellent collection of metalwork; especially the hammered work of Mr. Thomas, the cast-iron panels or grilles exhibited by J. G. and R. Emms, of Bow; some fine art jewellery by W. Williams; embossed metal; the stoneware puzzle jugs of G. H. Hollins, whose exhibits at Bow we lately mentioned; and a terra-cotta model of a monk in prayer, by W. C. Baldwin. Copper engraving, old prints, pen and pencil drawings, and astronomical models and diagrams are among the thousand miscellaneous articles to be found at the Alexandra Park Exhibition, which is well worth a visit.

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THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

On Thursday week, as stated in our last number, a meeting of the Glasgow Town Council was held, when the Town Clerk read the following report by Mr. Charles Barry, who had been appointed to examine and report on the various designs:—

"Gentlemen,—In accordance with your instructions, as per resolution of the Corporation of 30th July last, conveyed to me by Dr. Marwick, the Town Clerk, by letter of the same date, I have paid two lengthened visits to Glasgow, and have devoted the whole of that time, as well as much time intervening and since here, to the careful consideration of the 96 sets of designs sent in competition for the new buildings, comprising in all 724 drawings. Explanatory reports in most cases are sent by the authors relating to arrangements, materials, and cost, applying to their respective designs. I have received every assistance I desired from the office of Dr. Marwick, and of Mr. Carrick, City Surveyor, the latter of whom has been so good as to take out the cubic contents of no less than 21 sets of drawings on one consistent principle I indicated to him, so as fairly to compare them. This was necessary, because in several cases where competitors named in their reports the cubic contents of their designs I have been unable to agree with their figures, but which must have been taken on some other principle than that I considered it right to adopt. I have been met at the outset of my inquiry by the difficulty, and as I believe the impossibility, of obtaining any building of the bulk required and of a suitable character for the sum of £150,000 named in the 'Instructions'; and, taking these instructions as my only guide, as they necessarily were the guide of each competitor, I find them in this respect not a little difficult to reconcile, for on the one hand they are accompanied with a plan, worked out in much detail, of each floor, to which, as to the arrangements generally, and as to the bulk absolutely, each competitor was to adhere. The heights of each story are also there given, defining the vertical dimensions of the new building with nearly the same precision as the plan does its horizontal dimensions. Adding together these heights of the several stories, and making only moderate additions for foundations, the thickness of the several floors enables a cube to be made out up to the general parapet level of the building, which I had done in each of the above cases. Pricing out this cube at the rate of 1s. a foot up to top of parapet, and 1s. 6d. a foot for any feature above that level, such as towers, domes, lofty and decorative roofs, turrets, &c., &c. (prices which I consider only moderate), would show that to carry out the plans issued with the instructions would cost not less than £193,000, instead of the £150,000 named to competitors. As, however, this £150,000 is there named, I have felt the only fair plan towards the competitors was to deduce a rate per foot cube from it, and from the plans issued with the 'Instructions.' Thus, if from the £150,000 mentioned in them the very moderate allowance of £12,500 be allocated to roofs, turrets, towers above parapet level, we have £137,500 left, which gives about 9d. a cubic foot for the main building. This, I think, as above said, an insufficient sum, inasmuch as the plainest possible building of the proposed bulk shown in Mr. Carrick's plans, and priced as I consider proper, would, in my opinion, cost not less than £193,000, without costly features or expensive decorations. It is, therefore, only fair to the competitors, many of whom no doubt have an acquaintance with Glasgow and the cost of building there, to suppose that reading the instructions, which they would deem to be carefully prepared and issued under the authority of the Corporation, the sum named by them—£150,000—for a suitable building of the size, they also so clearly indicate would suffice, and that in forming their estimates they would take the rate thus arrived at, or about 9d. a foot cube. I have therefore had 21 of the best designs cubed, and have myself priced them out at this rate up to parapet level without further necessary allowances for features above that level, as were shown in the designs, the cost of which naturally differs widely. Of these I have selected, as requested, the three best that I could allow myself to put before the Corporation, which would apparently come under or about £150,000 in cost if priced at the reduced rate above mentioned. Against the mottoes of these three designs I have shown in tabular form—1st, the cost, taking as basis the cube deduced from the plan supplied with the instructions and the information therein as to the heights of stories, and priced at the rate arrived at as described; 2nd, the lowest cost that, in my judgment, each of these three designs could be well executed for in stone in a solid, durable, plain manner, without marble, expensive sculpture, externally and internally, decorations, and the like, for which purpose a large extra sum should be appropriated in any design that may be carried out. I place these three designs before the Corporation, and think the premiums must be awarded to them inasmuch as they most nearly are in accordance with the embarrassing letter of the instructions. These three designs are:—

Mottoes.	Cost at same rate as Mr. Carrick's plan, if it cost but £150,000.	Cost as estimated by me, without expensive feature, sculpture, or rich decoration.
1st 'Carton.' Estimated by author at £150,423. (Nos. 89, 90, and 91) ...	£158,800	£220,000
2nd. 'Fidelity,' No estimate given. (No. 18)..	151,000	200,000
3rd. 'Let Glasgow Flourish for Ever.' Design A. Estimated by its author at £143,728. (No. 31)	141,500	188,000

"A few remarks on each of the three designs thus recommended may be useful here. 'Carton' sends not only a creditable design, but also has worked out a really good plan, much improved, as I think, on Mr. Carrick's, as regards the light on principal stairs, as giving a duplicate grand staircase, and as providing a continuous corridor all round on the first floor, which on grand and crowded receptions would afford relief to reception-saloons and town-hall. In this plan these great apartments are also so arranged as to enable separate or combined use to be made of them. 'Fidelity' has sent two plans, showing little variation from Mr. Carrick's. He has apparently misunderstood the letter from Dr. Marwick of 21st April, 1880, and supposed that it confined him absolutely to the first instructions of 9th March, 1880, as regards any alteration of plan; whereas it evidently referred to the two letters of 9th March and 9th April, 1880, which permitted such alterations. He makes no allusion in his report to cost, and must therefore be assumed to adopt that named in the instructions. Priced in the way I have considered he is entitled to do, he has very nearly complied with them. 'Let Glasgow Flourish for Ever,' design A.—The author has given explanatory plans of each floor, with, however, but little variation from Mr. Carrick's plan. His design A seems to me to be the better of the two sent in by the author. His estimate for it is £143,728, which, although quite consistent with the above-named calculations founded on Mr. Carrick's plan and the instructions, I think is too low, being only at the rate of 9½d. for the whole building, including dome, angles, turrets, &c., which are necessarily expensive features. I feel bound to say, further, that there have been sent in designs of much superior merit to any of these three, but more costly, though not, in my opinion, a particle too good or too costly for the Municipal Buildings of so important a city as Glasgow. The cost of these appears to range from £180,000 to £250,000. It is with great regret that, bound as I am by the instructions, I do not feel at liberty here to mention these designs, or to recommend them for the premiums which (if judged by merit only) they ought to receive. Several of the other designs also show a careful study-rearrangement of the plan, which, if well arranged, will of course be found all-important in the working and daily use of the premises satisfactorily, and some of these contain suggested alterations which would (were it possible under such circumstances) well deserve the careful consideration of the Corporation, under the advice of the city surveyor. These, again, I am not at liberty to mention specifically." Dr. Marwick went on to say that on the sealed envelopes containing the names of the competitors being opened it had been found that the first was "Carton," Mr. George Corson, architect, Leeds; the second "Fidelity," Messrs. Coe and Robinson, 4, Furnival's Inn, London; and the third, "Let Glasgow Flourish for Ever," Mr. Edward Clarke, 6, Adam-street, Adelphi, London.

The Lord Provost said that, in addition to the report, Mr. Barry had also sent to the council a communication that he (Mr. Barry) did not wish to be published.

Mr. Mathieson said the letter was sent under cover of a letter sent to Dr. Marwick, which was marked private. The letter to which his lordship referred was addressed to the Lord Provost and Corporation of Glasgow. There was nothing on or in the letter as to whether Mr. Barry wanted the letter kept private or published. The letter was the property of the corporation, and he apprehended that whatever was the property of the corporation was the property of the public. And he thought they would be guilty of a dereliction of duty if, having received that letter, they did not place it before the citizens of Glasgow. It was for the benefit of the corporation that the representatives of the people of Glasgow should see this letter, to assist them in the consideration of this most important subject—a subject on which members of the magistracy and council required great assistance.

Bailie Laing: Why is it not in the report?

Mr. Mathieson said, as to that he had nothing to say.

Mr. Gray: Am I right in understanding that there is nothing mentioned——

The Lord Provost said he saw nothing in the letter itself that made it at all necessary or proper that it should be withheld. It was solely because Mr. Barry had indicated that it should not be published that he had made the suggestion.

Mr. Reid moved that the reporters retire and that the letter be read to the council, and after that the council might make it public or not, just as they thought proper.

Bailie Laing seconded that proposal.

Treasurer Hamilton thought they should get Dr. Marwick's opinion on this matter as to whether the letter should be read or not.

Mr. Smith said Mr. Mathieson was quite right in bringing this matter up in the way he had done. With all due deference, he considered his lordship was in error when he considered the letter should not be published.

The Lord Provost: It is no wish on my part that it should be withheld. It is solely because Mr. Barry has so indicated.

Mr. Torrens suggested that the reporters should retire, and then after the letter had been read to the council they could decide what action should be taken.

The Lord Provost said that was really what he proposed. The report having been read the council would now hear the letter read.

A Member: In private.

Mr. Mathieson asked the council whether it was possible to keep anything private if it was read to the whole corporation? If it was not kept private it would be garbled outside, and was it not better that it should be fully and clearly reported than published in a garbled state?

The Lord Provost said it was not his opinion he was giving, but Mr. Barry's, and surely Mr. Barry was the best judge as to how his own document should be handled.

Mr. Gray thought the council should not run in the face of Mr. Barry. It would be a breach of faith to publish the letter.

The reporters then retired, and after an absence of about a quarter of an hour, were readmitted. The members of the council were nearly all on their feet, and still wrangling as to the course that should be adopted with reference to the letter.

In the midst of the confusion, a member asked whether the council were thoroughly independent as to which plan they might adopt.

The Lord Provost: We are perfectly free regarding all.

Mr. Jackson asked if he was right in understanding that every competing architect would feel perfectly satisfied if the council departed from the proposal and accepted none of the premium designs. After the council had inspected the designs, one might be accepted by the council, and the original awards departed from altogether.

The Lord Provost: The adoption of any one of those 96 plans is still competent to the council.

Mr. Jackson said if they went in for a more expensive plan some of the architects might say that if a larger sum had been allowed for the building they would have sent in better plans.

A Member: There is no doubt Mr. Jackson is right.

The Lord Provost moved that Mr. Barry's report, having been read, be accepted.

Bailie Scott seconded the motion.

Mr. Smith said that, of course, carried with it the awards.

Mr. Mathieson supposed that, if the council adopted that motion, the report would lie on the table till next meeting, and members, after having examined the plans, would be in a better position to discuss the matter at next meeting.

The Lord Provost asked if Mr. Mathieson moved that as an amendment.

Mr. Mathieson said he did not. He accepted the report, and his only hope was that, although it should cost the Corporation the £1,500, it would be of use to the Town Council from an educational point of view, because he believed, with the utmost deference and with due humility, that an education of that sort was very much needed, and it would be a solemn obligation on the part of every member of the Corporation to see that he gave this question the fullest and most serious and personal consideration. It was an important question, and had not hitherto received that attention which it was entitled to. ("Oh, oh.")

Mr. W. R. W. Smith said that, looking to the opinion Mr. Barry expressed, they were not spending enough money, and more than that, he thought the subject had not yet received due consideration.

Treasurer Hamilton thought it would be a breach of honour to print the letter. There was matter in the letter that affected them very considerably as to the value of the property and so forth. However, he thought it would be as well not to publish the letter in the mean time.

Mr. Martin said the Treasurer had let out the whole secret, and they need not keep it any longer now.

After some further discussion as to the course to be followed,

Treasurer Hamilton withdrew this motion in favour of one by the Lord Provost, that Mr. Barry should be written to and asked to give his consent to the publication of the letter.

This motion was ultimately carried unanimously, and Dr. Marwick was instructed to have Mr. Barry's report and letter printed and circulated amongst the members of council, as soon as Mr. Barry consented to the publication of the letter.

The council then rose.

[The general tenor of Mr. Barry's letter, with reference to which the foregoing discussion occurred, was that he had been careful to conform his report and his awards to the sum named in the letter of instructions issued to competitors, although, on considering the space to be covered by the buildings and the character which they ought to bear, his opinion was that a much larger sum than that specified would be required. If, after payment of the premiums, the council should feel disposed to reconsider the question of the designs apart from the question of cost first fixed, he would be prepared to advise the corporation. He had visited the site and examined the Acts of Parliament, and as he thought additional ground might be required, he was pleased to know that compulsory powers of purchase had been taken over a more extended area, thus securing the amenity of the buildings, and providing for future necessities.]

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THE WESTMINSTER VESTRY HALL COMPETITION.

We reviewed on July 9th last (p. 33) the eleven sets of designs for the proposed public offices for the united parishes of St. Margaret's and St. John's, Westminster, sent in in response to invitations to join in a limited competition. Mr. Charles Barry, who was selected as arbitrator, has since issued the following report:—

PROPOSED NEW PUBLIC OFFICES FOR THE UNITED PARISHES OF ST. MARGARET'S AND ST. JOHN'S, WESTMINSTER.

1, Westminster Chambers, Victoria-street, S.W.
19th August, 1880.

Gentlemen,—In accordance with your instructions I have viewed the site of the intended Vestry Offices for the United Parishes of St. Margaret's and St. John's, Westminster, and have also carefully examined the 11 sets of plans and designs sent in competition by architects applied to for the intended new buildings. They are in various styles of architecture, but the majority are in one or other of the ordinary treatments of the French Renaissance, a style which I think is not unsuitable for such a purpose.

They may be roughly divided into two principles of treatment as far as plan and bulk of building is concerned, viz., those which are so arranged as to obtain their window lights wholly and only over the area shown on the plan of ground issued with the instructions, and the other those who depend more or less largely on lights obtained over the adjacent land to the east.

It will be obvious that the first class avoid any interference with the ancient lights of the schools on the west side, and do not lessen the adaptability, and therefore the value, of the adjacent land on the east, for whatever purposes it may be required.

One set of plans with the motto "Duty" does not comply with the instructions, inasmuch as it does not provide several of the rooms asked for, it shows no complete plan at all of the large room, and in other respects the plans are not sufficiently worked out to exhibit the intended design. I therefore put it aside, leaving 10 sets of plans as to which my judgment is asked.

In accordance with your instructions, I have had each of these designs cubed out, and append my approximate estimate of each, separating this estimate into two heads, one for the vestry offices alone, and one for the large room and its appurtenances, it being perfectly obvious that many of the competitors have assumed the sum of £15,000 named in the instructions to apply to the first-named only. It is, indeed, obviously impossible to construct a building which shall embrace both, at all suitable, either in place, accommodation, or in appearance, for that sum.

I append, in a tabular form, the estimates furnished by the authors of the plans respectively shown, and also my approximate estimate of each.

I may here mention that I find the estimates by authors vary in their rates from 6¾d. to 11⅓d. per cube foot for the vestry offices, and from 3¼d. to 8½d. for the large hall.

On the subject of cost, therefore, having furnished the vestry in this way with the means of forming their own judgment, I say no more.

Referring, now, to the merits of the respective designs, I have considered, primarily: the plan arrangements as regards compactness; the relative position of the several departments; how far they are (as I think they should be) self-contained; the character of the staircases, halls, and corridors; and, lastly, and by no means least, the provision of good light both to rooms and corridors.

I place the designs as to general merit in the following order:—

No. 1. Stet.
" 2. Portcullis in Circular Strap.
" 3. Black Star.

And to these in such order I advise the premiums to be adjudged.

The order of merit of the remaining designs I consider to be as follows:—

No. 4. Civis.
" 5. La Casa della Citta.
" 6. Fortuna Sequatur.
" 7. Unitas Design (B).
" 8. Unitas Design (A).
" 9. Maltese Cross in an oval.
" 10. Suum Cuique.

In considering the treatment and size of the large public room, I have thought it would be useful, also, to subjoin a rough statement of the areas shown on the respective plans, and while it is difficult to estimate how many could be accommodated in the large or small galleries proposed by the several competitors, I think it will be evident that no one of the rooms shown could accommodate 1,000 persons on the floor area.

I hope the Vestry will not think it improper on my part if I venture to advise that the amount of the first premium be paid independently of the usual commission, should the author of this design be employed to carry it out, as I cannot but be aware, from long experience, that after a design has been chosen in competition, it is rarely, if ever, actually carried out as per competition plan; but entirely new plans have to be prepared with additions and modifications suggested by after experience, and when the architect, for the first time, finds himself in personal and confidential relations to his employers, while the actual expense in time bestowed on the thought needful to make a good design, and the preparation of the elaborate drawings required to exhibit it, are not too generously recompensed by the premiums offered.

I have the honour to remain,
Gentlemen,
Your obedient servant,
Charles Barry.

APPENDIX A.

New Vestry Hall and Offices

For the United Parishes of St. Margaret's and St. John's, Westminster.

ESTIMATES.

Mottoes.	Offices only.	Large Room.	Total.	Authors' Estimates for Vestry Offices only.
Suum Cuique	13,160	5,036	18,196	15,000
Unitas A.	15,645	3,786	19,421	11,737
Stet	15,779	6,313	22,092	10,032
Unitas B.	16,014	6,735	19,749	11,193
Portcullis in Circular Strap	16,188	7,547	23,735	15,000
Black Star	16,493	4,705	21,198	15,000
Fortuna Sequatur	17,050	6,163	23,113	10,834
La Casa della Citta	17.412	5,284	22,696	15,000
Maltese Cross in Oval	17,645	7,459	25,104	13,580
Civis	18,155	4,284	22,439	14,933

Note.—In the above, the estimates as regards the vestry offices only (without reference to the cost of the large room, which is very variable) have been adopted for the sequence, as per first column, which can be compared with the respective authors' estimates, which are in the last column of the foregoing table.

APPENDIX B.

New Vestry Hall and Offices,

United Parishes of St. Margaret's and St. Jonh's

Westminster.

Statement of the areas on the ground floor of the large hall, as proposed by the authors of the several plans sent by architects in the competition :—

Unitas Design A.	about	2,500
Unitas Design B.	about	2,500
Black Star		2,550
Portcullis in Circle		2,886
Civis		2,972
La Casa della Citta		3,150
Stet		3,402
Fortuna Sequatur		3,528
Suum Cuique	about	4,000
Maltese Cross in Oval		4,600

Mem.—In a room to hold the required 1,000 people it may perhaps be assumed that 250 may be accommodated in galleries, leaving 750 to have seats on the floor.

I think that to include passages between seats and platform and other waste space, 6ft. super per person is the least that can be allowed.

Thus 750 persons at 6ft. each will need 4,500 feet super of floor area.

This report was discussed by a committee of the vestry of the united parishes at the Alexandra Schools on Tuesday afternoon. Representatives of the press were not admitted, but we learn that the report was warmly discussed, several of the members adversely commenting on the referee's intimation that a building is rarely carried out from the plan selected in competitions. It was urged that if all the plans so largely exceeded the amount named in the instructions drawn up by Mr. Arntz, it would be desirable to have a new competition; others were in favour of adopting designs placed low in the list. After a discussion, which was protracted from 2.30 till 5 p.m., the motion that Mr. Barry's report be adopted was rejected by 13 votes to 10, and it was decided to remit the whole subject to a meeting of the full vestry to be convened for a fortnight hence. It was decided to restrict the examination of the competition designs to members of the vestry until after the full meeting.

The envelopes containing the competitors' names have not yet been opened, but it is understood that the first premiated design, "Stet," is by Messrs. Lee and Smith, Victoria-street, E.C.; "Black Star," by Mr. Trollope; "Civis," by Mr. Powell; "La Casa della Citta," by Mr. T. E. Knightley, 106, Cannon-street, E.C.; "Unitas Designs 'A' and 'B,'" by Messrs. Seddon and Gough, Queen Anne's-gate, Westminster; "Duty," by Mr. Bradwell, Great Queen-street, Westminster. The premiums offered were £100, £70, and £50.

TROY.

According to a correspondence with which Dr. Schliemann has favoured the *Times*, during the last spring and summer months, his new book on his excavations at Hissarlik may be looked for simultaneously at Mr. Murray's, in Albemarle-street, and at Brockhaus's, in Leipsic, on the 10th of November. The English work, under the title of "Ilios, the City and Country of the Trojans," is to rank as the original, which Dr. Schliemann himself translates into his native German. We are promised 2,000 accurate engravings, after photographs from as many typical antiques, with plenty of trustworthy plans and maps. The book, when published, will reveal evolutions of the author's ideas, especially in reference to the historical stratification of Hissarlik mound, such as can hardly fail to cause a good deal of surprise. Homer's Troy, which at the outset Dr. Schliemann had identified with the first city ever built upon the site, that beneath which there was nothing but the virgin rock, while his discovery of what he called Priam's treasure in the next overlying layer of ruins clinched what had long been his conviction that this must have been the gold-bedight metropolis of the king, has now become the third of seven successive cities, instead of the first or second of five. The Homeric archæologist has, in fact, adopted the view of his friend, Professor Sayce, of Oxford, who during his visit to the Troad in the autumn of last year discovered that two cities, both built of stone, preceded the brick city then, as now, identified by Dr. Schliemann with Homer's Troy, and not one stone city only, as had hitherto been thought. The evidence reserved until now, for thus dividing into two the undermost bed of stone débris at Hissarlik (a bed about seven yards thick stretching from the same height above the level of the plain to eleven yards above the top of the hill), will be given at large in "Ilios." Whether the people of the second of these stone cities were driven thence by an enemy or voluntarily abandoned the site Dr. Schliemann could not find out from the ruins. Of a great fire, he writes us, he saw no trace; three burnt houses only turned up here. The site seems to have lain waste for a long time, for the rain had had time to scoop out a great number of large holes shaped like funnels. These and other inequalities of the ground the new settlers filled up with stones or cakes of clay, shooting the superfluous rubbish down the steep slopes of the Mound. Their own new town they reared of very large bricks baked slightly and mixed with straw and grass. In a few instances only the walls of the ground floor were of small stones with clay cement, but the upper stories were always built of bricks joined together with brick-earth. As the old rampart on the south side could be easily scaled, they erected just in front of it another wall sloping at an angle of 15°. On this and the adjoining old walls they built a large double wall of brick, with an interior passage and surmounted by many towers. The stupendous masses of brickwork with which the gateway was covered to the depth of 8ft. and even 10ft. leave no doubt that this portal was crowned with a huge tower. Where the new city shrunk far within the lines of the old, as on the east side, or overlapped it, as on the south-east, the old ramparts could not be used as substructions. Hence, in these places the new settlers either built fresh ramparts to support their brick walls, or else laid on the *débris* single or double courses of large flags, which they then covered with double or treble layers of clay cakes, and on these latter erected the brick walls. Of these brick walls, with the interior passage, large segments may still be seen on the north-east, south-east, and south sides. With tiny saws of silex or chalcedony and stone axes the builders could neither cut nor cleave planks, but used beams covered with brick earth to floor their houses, each of which had also a clay-paved terrace. Besides the large street leading to the gateway there was but one other, about 6ft. broad and paved with great flags, which is to be seen to the east of Dr. Schliemann's great north and south trench. This city, the discoverer holds as firmly as ever, must have been fired by the hand of an enemy. It fell suddenly, as is clear from the skeletons found helmeted and with arms in their hands, as well as by the ten treasures of gold and other jewels, plainly left by hurrying fugitives. Nine of these he picked up in or hard by the royal house near the gateway, from which it was only separated by what was plainly the Agora, which the Iliad locates before Priam's doors (II., 788; VII., 346). Yet, as visitors may satisfy themselves, the south-east corner of the city was spared by the flames, so far verifying the local tradition attested by Strabo (XIII., p. 600), that Troy was not utterly destroyed by the avenging Greeks. From the prophecy which Homer (Il., XX., 307-8) puts into the mouth of Poseidon, that the sons of the sons of Æneas should rule over the Trojans, Dr. Schliemann infers the currency of this tradition in the bard's own time. The Homeric archæologist seems now to think, in spite of some appearance to the contrary, especially the difference in architecture, that out of this remnant of the third city sprang, like a phœnix, the fourth. His principal arguments are the striking resemblances between the pottery of both (notwithstanding the emergence of new types in the later stratum) as well as in the idols, particularly those of the Owlfaced Athené, and in the votive whorls dedicated to her. Again, he says:—

"The supposition that the people of the fourth city was identical with that of the third—the burnt city—seems likewise confirmed by the configuration of the layers of *débris* above the road which leads from the gate to the plain. In fact, as visitors will convince themselves by a glance at the strata of the large block of *débris*, 40ft. high, which I have left *in situ* on the gateway road, the very same road, though covered to the depth of 8ft. or 10ft. by the *débris* of the burnt city, continued to be used by the inhabitants of the subsequent city for going in and out."

As to the striking architectural difference, that not a single brick was found by him in this later city, it is urged that the conflagration may have convinced the Trojans of the unsafeness of that material. Hence "they agreed by common consent to abandon it, and to build thenceforward only stone housewalls, such as visitors see above the burnt city."

Dr. Schliemann concludes the long letter whence the above brief extract is taken by resuming his arguments for the identification of Homeric Troy—no new points, however, being made—and by answering the objections drawn from the "Iliad" itself against his theory. The bulk of the stumbling-blocks, scorning to fall back on the bard's poetic licence at the cost of his historical fidelity, he evades by what the lawyers call the plea of confession and avoidance. He frankly owns that, with the above exception, the third Hissarlik city was not broad-streeted, as Homer calls Ilios. Nor was it either well-built or populous, great or flourishing. It had no Acropolis, the meanly-built brick town on the hill being its own Pergamos, with no lower city on the table-land beneath to defend. Its area was about that of Trafalgar-square, and its population 3,000 at the utmost—say a tithe of that of Torquay. But we are reminded that when Homer visited the site, about the middle of the 9th century before our era, the Ilios of the Æolic Greeks had supplanted not only the rebuilt Troy of the Æneadæ, but a couple of other cities besides, and was itself in the third century of its age. It had long outgrown the sacred site, which had now become only its citadel, where its gods were housed in their temples, and which, centuries afterwards, Xerxes climbed to sacrifice to Athené. This was the Pergamos Homer described as Priam's—which was really, at that time, seven yards below the soil—and the Troy of which he sang so loftily was that which lay at its feet on the plateau, a city truly great, broad-streeted, populous, and flourishing, so as to be well able to sustain, with the help of its powerful allies, a siege of ten years. A still stronger objection against regarding Hissarlik as the site of Troy has always been drawn from the hydrography of the plain. For, according to all the indications in the "Iliad," the Simois falls just in front of Ilios into the Scamander, whereas Dr. Schliemann's river Simois (the Doumbrek Su) falls into the Kalifatli Asmak; not into the Mendere Su, which he agrees with others in identifying with the Homeric Xanthos, or Scamander. Moreover, the Homeric Scamander undoubtedly flowed between the Greek camp and Ilios, whereas the course of the Mendere is really on the west side of the Plain of Troy, so that the hostile armies in their movements between the Hellespont and Troy need not even have approached it. It is but fair to Dr. Schliemann to say that from the very outset he has insisted (in meeting these objections) that in the time of Homer the Scamander, as far as the modern village of Koum Kioi, filled the immense bed of what has now dwindled to the little rivulet known as the Kalifatli Asmak; that from that point it turned eastward; and that it flowed into the Hellespont by the broad bed of the dead, and, in the rear, blind watercourse called the In Tepeh Asmak. It will be shown in detail in "Ilios" that this hypothesis of a change in the bed of the Scamander is triumphantly borne out by the geological investigations of Prof. Virchow. His numerous and deep dredgings in the bed of the Kalifatli Asmak and in that of the In Tepeh Asmak have brought to light in these ancient channels the tell-tale scour of disintegrated syenite brought down aforetime by the Scamander as it flowed through the stratum of that mineral through which the Homeric river breaks just above Ewjilar, at the foot of Ida. From the In Tepeh Asmak fragments of brick have also been fished up; they may have belonged to brick-built Ilios itself, which, from this point of view, may not improbably have descended towards the river, a site very suitable for a suburb. The ancient estuary marked by the In Tepeh Asmak seems to bear the name Old Scamander in Pliny, H. N.; v. xxxiii., 1—a passage plausibly cited by Dr. Schliemann as throughout supporting his view of the hydrography of the Troad.

"The *débris* of the fifth city," writes Dr. Schliemann in his last descriptive letter, "are characterised by a complete absence of stone weapons and implements, which occurred in such immense abundance in the preceding towns. But as to the pottery, I have not noticed any great change; though wheel-made vases are more abundant here, yet by far the greater part of the pottery is still hand-made. There occur here some new types of terra-cotta vessels, but most of the old forms remain, and the mass of terra-cotta whorls, ornamented or plain, is here just as great as before. The small marble idols, with an incised owl-head, are here even more abundant than in any of the preceding cities.

But the architecture of this fifth city must have been totally different, because there are here neither brick nor stone walls. Hence I cannot help thinking that this last pre-historic city was of wood." This wooden Troy he thinks must have been succeeded by a Lydian settlement, mainly on account of the very strong resemblances between its pottery and that of the Etruscans, whose migration from Lydia to Italy, as reported by Herodotus, he unreservedly accepts. The plantation of this Lydian colony on the Hissarlik Mound he dates long before this westward movement. Besides the marked Etruscan affinities of the pottery found in the layer of ruins next below those of the Æolian city, as contrasted with the ceramic remains of the older strata, attention is called to another very interesting point. Dr. Schliemann affirms that in the ruins described by him as Lydian are repeatedly found the same strange written character which figures above the doors of the ancient hut urns said to have been found below the *peperino* at Marino, near Albano, as published by Sir John Lubbock and Signor Pigorini. As this written character is common to the Lydian with the third, fourth, and fifth cities, Dr. Schliemann has submitted to Professor Sayce, who writes for "Ilios" the appendix on the score or so of short inscriptions which have turned up in the pre-historic strata at Hissarlik, his idea that the Lydian language must have been identical with that of the three cities in question. Professor Sayce replied as follows:—

"You are right in thinking that the Trojan language was akin to that of the Lydians, and that both Trojans and Lydians used the same syllabary. I have been brought to exactly the same conclusions by my researches. The most important fact acquired is the one derived from Mr. George Smith's discovery of a clay cone inscribed with Kypriote characters under the floor of Assurbanipal's palace at Kouyunjik. This cone is almost a duplicate of the two cones you discovered inscribed with the Kypriote character which I read *mo*, and the Kypriote characters upon it belong to the Trojan form of the Kypriote syllabary. Now, Gog or Gyges, King of Lydia, sent tribute to Assurbanipal, who states that the very name of Lydia had previously been unknown to the Assyrians. Indeed, we learn from the Assyrian monuments that up to that time the Assyrians had never penetrated westward of the Halys. You see, therefore, what important consequences follow. 1. The cone must have been brought to Nineveh by the Lydians, and either there was a close and intimate connection between Lydia and Troy, or else the Lydians used exactly the same form of the Kypriote syllabary as did the Trojans. 2. This syllabary was in use in the Troad (and Lydia?) at least down to about B.C. 650. 3. The painted archaic vase-fragment, with the character signifying *mo* thereon, found by you in the Æolic Ilion, would belong to about the latter period, from which we may gain some idea of the great age of the inscribed objects you found at greater depths and of the objects associated with them. I do not hesitate to say that the discovery of the Trojan inscriptions constitutes the most important contribution that has been made of late years to the science of palæography. And, what is more, it reveals a new and unexpected chapter in the history of Asia Minor. If only we possessed some Lydian inscriptions we might be able to determine the age of Troy and its relations to Lydia."

The seventh city—that of the Æolian Greeks—has already been touched upon. Dr. Schliemann thinks it was built soon after their expulsion from the Peloponnesus by the Dorians—an event usually dated about B.C. 1100. Formerly the Homeric archæologist followed Strabo in dating the foundation of the Greek Ilion some four centuries later.

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INJURY TO GAS AND WATER-PIPES BY LIGHTNING.

THE city gas company of Berlin, having expressed the fear that gas-pipes may be injured by lightning passing down a rod that is connected with the pipes, Professor Kirchhoff has published the following reply:—"As the erection of lightning-rods is older than the system of gas and water pipes as they now exist in nearly all large cities, we find scarcely anything in early literature in regard to connecting the earth end of lightning-rods with these metallic pipes, and in modern times most manufacturers of lightning-rods, when putting them up, pay no attention to pipes in or near the building that is to be protected." Kirchhoff is of the opinion, supported by the views of a series of professional authorities, that the frequent recent cases of injury from lightning to buildings that had been protected for years by their rods, are due to a neglect of these large masses of metal. The Nicolai Church, in Griefswald, has been frequently struck by lightning, but was protected from injury by its rods. In 1876, however, lightning struck the tower and set it on fire. A few weeks before the church had had gas-pipes put in it. No one seems to have thought that the new masses of metal which had been brought into the church could have any effect on the course of the lightning, otherwise the lightning-rods would have been connected with the gas-pipes, or the earth connection been prolonged to proximity with the pipe. A similar circumstance occurred in the Nicolai Church in Stralsund. The lightning destroyed the rod in many places, although it received several strokes in 1856, and conducted them safely to the earth. Here, too, the cause of injury was in the neglect of the gas-pipes, which were first laid in the neighbourhood of the church in 1856, shortly before the lightning struck it. The injury done to the schoolhouse in Elmshorn, in 1876, and to the St. Lawrence' Church, at Itzehoe, in 1877, both buildings being provided with rods, could have been avoided if the rods had been connected with the adjacent gas-pipes.

"If it were possible," says Kirchhoff, "to make the earth connection so large that the resistance which the electric current meets with when it leaves the metallic conducting surface of the rod to enter the moist earth, or earth water, would be zero, then it would be unnecessary to connect the rods with the gas and water-pipes. We are not able, even at immense expense, to make the earth connections so large as to compete with the conducting power of metallic gas and water pipes, the total length of which is frequently many miles, and the surface in contact with the moist earth is thousands of square miles. Hence the electric current prefers for its discharge the extensive net of the system of pipes to that of the earth connection of the rods, and this alone is the cause of the lightning leaving its own conductor."

Regarding the fear that gas and water-pipes could be injured, the author says: "I know of no case where lightning has destroyed a gas or water-pipe which was connected with the lightning-rod, but I do know cases already in which the pipes were destroyed by lightning because they were not connected with it. In May, 1809, lightning struck the rod on Count Von Seefeld's castle, and sprang from it to a small water-pipe, which was about 80 metres from the end of the rod, and burst it. Another case happened in Basel, July 9, 1849. In a violent shower one stroke of lightning followed the rod on a house down into the earth, then jumped from it to a city water-pipe, a metre distant, made of cast iron. It destroyed several lengths of pipe, which were packed at the joints with pitch and hemp. A third case, which which was related to me by Professor Helmholtz, occurred last year in Gratz. Then, too, the lightning left the rod and sprang over to the city gas-pipes; even a gas explosion is said to have resulted. In all three cases the rods were not connected with the pipes. If they had been connected the mechanical effect of lightning on the metallic pipes would have been null in the first and third cases, and in the second the damage would have been slight. If the water pipes in Basel had been joined with lead instead of pitch, no mechanical effect could have been produced. The mechanical effect of an electrical discharge is greatest where the electric fluid springs from one body to another. The wider this jump the more powerful is the mechanical effect. The electrical discharge of a thunder cloud upon the point of a lightning rod may melt or bend it, while the rod itself remains uninjured. If the conductor, however, is insufficient to receive and carry off the charge of electricity, it will leap from the conductor to another body. Where the lightning leaves the conductor its mechanical effect is again exerted, so that the rod is torn, melted, or bent. So, too, is that spot of the body on which it leaps. In the examples above given it was a lead pipe in the first place, a gas-pipe in the last case, to which the lightning leaped when it left the rod, and which were destroyed. Such injuries to water and gas-pipes near lightning-rods must certainly be quite frequent. It would be desirable to bring them to light, so as to obtain proof that it is more advantageous, both for the rods and the building which it protects, as well as for the gas and water-pipes, to have both intimately connected. Finally, I would mention two cases of lightning striking rods closely united with the gas and water-pipes. The first happened in Düsseldorf, July 23rd, 1878, on the new Art Academy; the other August 19th, last year, at Steglitz. In both cases the lightning-rod, the buildings, and the pipes were uninjured."—*Deutschen Bauzeitung.*

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CHURCH - BUILDING AT BORDEAUX.

THE name of the city of Bordeaux is so familiar to us, and its history for so long a time formed a brilliant portion of our own, that its welfare will long continue to be a subject of interest to English readers. With its large commercial population and important trade, its fine cathedral and ancient churches, its splendid "Place" (called des Quinconces), pretty Jardin des Plantes, and well-stocked museums, it is a city of considerable interest to the traveller, be he architect, archæologist, or merely sightseer.

Briefly described, Bordeaux is situated upo the Garronne river, about 30 miles from the sea. Its plan is roughly in the form of a broad crescent, with the river upon the inner curve, towards the east. The ancient city, some of whose boundaries and gates yet remain, is still the centre of trade; a nucleus from which the town has spread, and is spreading, in all directions. There is a small suburb upon the opposite bank (La Bastide), connected by a good stone bridge with the main portion.

The population is now about 200,000, a Republican community on the whole; but some other sections of public opinion, the "Reactionists," as the French term them, are not without representatives or influence. These facts are intimately related to my subject, as the anticlerical feeling which some Republican populations have developed is an effectual check to religious progress of all kinds. Here, religion has vigour and interest enough to maintain a position in the advancement of the age and the place, and church-building is being carried on, and considerable sums expended, under the direction of architects of acknowledged ability.

The most prominent work is the new church of St. Louis, whose two spires rise conspicuously over the houses near the river, at the north-central part of the town. It is a large building, measuring as much as 300ft. by 100ft. over extremes. The style is Geometrical Gothic, of a light yet uncomplicated character. The church consists of a wide and lofty nave of six bays, with triforium and clerestory, aisles of an ordinary proportion, with lancet windows, transepts of about 10ft. projection beyond the aisles, choir terminating in polygonal apse, and smaller semi-octagonal apses in transepts opposite aisles. The customary orientation is also reversed, apparently for the better application of a great "W." entrance. (The familiar initials are used to denote the conventional aspects of façades). There is a large W. porch in three bays, between two towers, and over the porch a gallery which is to contain the organ, and there is also a porch-entrance into N. transept. The whole is vaulted in stone. In the nave the quadripartite vault has shafts running down to bases upon the capitals of the lower piers. These are formed as four three-quarter shafts, grouped round a larger central one, and are of very satisfactory proportions. The clerestory, the windows having central mullions with cusped circles in heads, is simple, lofty, and satisfactory; but the triforium is discontinuous horizontally, and rather weak in detail. It has two trefoil-headed openings to each bay, grouped with the clerestory over, and the intersecting mouldings and poorly-carved spandrils are not of the same character as the rest of the structure. The transepts are of agreeable appearance. The large windows have a great circle (with radiating shafted tracery) resting upon a transom considerably below the springing line, below which the mullions finish with trefoil heads—a combination of the circular window with the pointed arched opening. This tracery appears, from the interior, rather thin; but this and some other effects can only be fairly judged when the stained glass is fixed. At present the E. end only has been so finished. The glass is pretty rather than good, the colours in the canopy work are rather crudely mingled, and the figures are somewhat too pictorially painted and shadowed. Externally, the W. end, which is the richest façade, has its two towers finished with pierced spires and pinnacles, and with gablets and crockets, and, over the entrances, a large rose window, opening into the gallery upon the vault of porch. The rest of the exterior has a rather cold and mechanical character. There are flying buttresses to the nave, which relieve and vary the clerestory, but the lines of the apse come down very straight, so that the lofty end seems to lack a basement of chapels or more projecting buttresses. This, portion however, is not conspicuously seen. There is, throughout, a considerable amount of horizontality in the somewhat prominent cornices, which are carried round all buttresses, &c., and across the bases of gablets. The nave is floored with wood, in apparent concession to the requirements of a modern large congregation, since such a floor is very unusual here. The chairs are marshalled in rows, but are not fixed. The pulpit is, as usual, advanced into the second bay of nave, so that nearly half of the congregation have to turn their backs to either the preacher or the altar. The aisles and transepts are not intended to have seats. The building, which is already used for service, is nearly completed, the principal work remaining to be done being about the W. entrances and gallery, &c., and the carving to lower parts of interior. The architect is M. Brun, of Bordeaux, and the cost will probably amount to 1,200,000 francs.

Another large and interesting church is being built on the east (La Bastide) side of the river, in the Avenue Thiers. It is yet hardly advanced enough to enable one to judge of its ultimate appearance. The nave arches are barely completed, and the E. end is only a little higher. The style is Early Pointed. The plan consists of a wide nave, in only three bays, aisles terminating in square chapels, and a choir with polygonal apse. There are no transepts. It is evidently a plan intended to accommodate a large congregation of worshippers who shall both see and hear, and the modification of the ordinary lines has led to some novelty. The large span of the nave arches (there being only three) causes the bays or divisions of aisles to assume an awkwardly long proportion. This is corrected by throwing out a rectangular projection between the buttresses, having about the same projection as they have, so that externally the buttress appears to stand in a recess. Probably the effect of this will not be so happy as curious; but of course much will depend upon the roofing lines. Internally, these bays will perhaps receive altars or other adjuncts of the services.

In planning this church, again, orientation is disregarded, the E. end being towards the north, so as to place the W. entrance upon the principal street, and the N. front upon the secondary one.

The details are not yet anywhere apparent, as, in the customary French method of using soft stone, the work is built in rectangular blocks, and afterwards worked in position. The stone used here is a soft white oolite, not unlike Bath, which hardens upon exposure, and appears in older edifices to stand very well. It is the usual building material of Bordeaux, used in large squared blocks, even for the commonest description of work, brick being very rare. This church is in the hands of M. Abadie, a well-known architect of Paris, by whom also were carried out the restorations of the magnificent Romanesque façade of St. Croix in this town.

The Church of St. Ferdinand, Rue de la Croix, in the north-west part of the town, is another fine work by M. Abadie, erected some few years back. It is in a Transition style, with pointed arches and circular windows without tracery. The interior is striking, the general effect being very fine. There is perhaps a little Renaissance-like fussiness about the square fluted and corbelled features, which do the work of vaulting shafts, and their detail does not seem quite harmonious. (Almost identical shafts are to be seen in the new church of St. Anselle, at Angoulême, probably by the same architect.) The simple massive circular piers and their plainly-moulded arches are dignified and well proportioned. The square ends to choir and transepts are not quite so happy. They have large circular windows which, without tracery, look weak and bare, and would doubtless gain greatly in effect if filled in with the early radiating shaft tracery of the style. The stained glass here, too, lacks flatness of treatment. Externally, this church has a W. entrance façade, flanked by two towers, and fronting the street. It has a slightly modern appearance, which is perhaps not necessarily a defect; but which seems to lose some of the dignity of the old work. Altogether, this is a church well worth examination. There is a large church in progress at the south end of the town near the Rue Billaudel. The plan consists of nave and aisles, transepts, and choir. The style is a kind of Romanesque with a plentiful use of circular windows; but here, again, the detail is as yet only vaguely foreshadowed by the axe-faced stones. The choir and transepts are roofed in but not yet vaulted, as is intended. The nave and W. end are only about up to the capitals of piers. The elevation of the W. front shows the usual important entrances from the principal street, and the usual two towers at angles. The walls are being faced externally with the white and a pale reddish stone laid in alternate courses. The architect of this work is M. Mondet of Bordeaux, who has in hand also the restoration next described.

St. Pierre is a church of considerable size and architectural value, situate near the centre of the river front of the old town. It has (or rather had) nave and aisles of the 14th century, with choir of the 15th, and is in course of reconstruction rather than restoration. The walls and clustered columns upon N. side of the nave are to be almost entirely rebuilt, and to those on S. side very extensive repairs have to be done. The lower part of W. front, with the graceful, richly-carved doorway, is to be restored and retained. The replacing of the decayed portions is commenced here; and this system of inserting the new stones and afterwards working them, seems particularly advisable for such work, as the mason, having the old work by which he is guided in actual juxtaposition to the stone to be cut, is more likely to produce a faithful restoration than by means of the best templates used apart. The nave is unroofed, and the vaulting taken down. The choir is partitioned off and not included in the present works. There is not yet much new work done to the main structure, but some subordinate erections (chapels &c.,) on S. side have been rebuilt or repaired. The site is very near the river, and the soil is simply the mud deposited (recently, geologically speaking) by the stream. The foundations—in some cases the reconstruction goes as far as to them—are consequently commenced with piles and timberwork. For this purpose a handy form of steam pile-driving machine is in use, of a construction probably not in use in England, and of which a brief description may be interesting. The heavy monkey, or "mouton" as the French workman calls it, is bored and fitted with a piston and rod, the end of which pointing downwards rests upon the head of the pile. It is supplied with steam by a flexible hose, and the valve has an arm (like an exaggerated street-lamp stop-cock) with two cords held by the operator. The valve being opened, the monkey raises itself upon the end of the piston-rod protruding below, then, steam being shut off, it falls in ordinary timber-framed guides, by its own weight. About forty or fifty strokes per minute can be thus made; but, of course, the amount of fall is limited to the length of piston-rod (about 3ft. in this instance), and greater weight must be used than for a longer drop. It will be seen that this kind of steam-hammer follows the pile as it descends; and also that the resistance to the raising being obtained on the pile, the force of that part of the stroke is expended to the purpose. It appears to be a very rapid and convenient machine. It might be an improvement to make the valve self-acting for shutting off steam at the end of the full stroke, leaving the hand arrangement also as at present.

The principal particulars in which the designs of these new French churches at Bordeaux vary from our own, may be summed up thus. The position of the edifice is determined without regard to the points of the compass, by the requirement of an important entrance from the principal street at what we call the west end. The nave, and crossing, if there is one, are alone considered the places for the seated congregation or principal services, the aisles and transepts being used for processional purposes and lesser services. There is no doubt that this more liberal floor-space, and the absence of the motive for paring down the main piers as obstructive, have much to do with the monumental effect of the structures. Fixed benches are out of the question, but the chairs, of improved pattern, are arranged in rows with light guide rails at intervals to preserve a proper distance apart. The choir, which has become perhaps somewhat less prominent, has often a small organ, but the great organ is generally placed in a W. gallery, a position whose many disadvantages has long led to our abandoning it.

The unfinished towers we too often see at home are rare here; the tower is apparently considered as necessary as the church itself.

Finally, there is to be seen everywhere a recognition of the fact that large congregations are in these days to be appealed to by the preacher's eloquence as well as by the mysteries of the ritual, and, therefore, provisions for proper hearing of it are necessary.

R. W. Gibson.

CHIPS.

New banking premises are in course of erection for the London and County Bank, opposite Blackheath station, S.E. The street façade is in bright red brickwork, with red sandstone dressings. Mr. George Bush is the contractor.

The first section of the Southwark and Deptford Tramway Co.'s line, that between the Brighton Railway-bridge in Deptford Lower-road and the Spa-road station of the South-Eastern Railway, will shortly be opened. The permanent way is being laid at the rate of about 200 yards per week, and the stabling, &c., are in course of erection. The works are being carried out from the plans and under the supervision of Mr. W. Shefford, engineer to the company.

In celebration of the extension of the Lynn and Fakenham Railway from Massingham to Hempton, the contractors, Messrs. Wilkinson and Jarvis, last week gave a dinner to their employés. Mr. Willet, the resident engineer, occupied the chair.

A brass lectern, set with ornamental stones, and the work of Messrs. Jones and Willis, of Birmingham, has just been added to the furniture of St. Thomas's Church, Halifax.

The Corporation of Cork discussed at great length on Friday a report from their engineer, Mr. T. Claxton Fidler, C.E., on the slow progress of the Anglesea Bridge works, in which that official expressed his opinion that the contractor, Mr. Alexander Rooney, had failed to make such progress with the works as he deemed sufficient to insure their completion within the prescribed time. It was proposed at the suggestion of the town clerk to deliver notice to the contractor stating the intention of the Town Council to proceed with and complete the works at his expense, as provided by the terms of the contract; but strong opposition was raised by a minority of the members on account of the engineer being appointed sole arbitrator in the dispute; and the question was, after a brisk exchange of personalities, adjourned till to-day (Friday).

The buildings of the new Corporation Sanitary Works at the Lamascote, Stafford, are rapidly approaching completion. On Thursday week, the capstone of the principal chimney stack was laid by the borough surveyor, Mr. McCallum. This chimney is 150ft. in height, and will provide for the dispersion of the gaseous products of the processes by which the sewage of the borough is to be converted by Firmin's process into a dry manure.

A new church of St. Matthew is nearly completed at Tipton-green, near Wolverhampton, and will be opened in a few weeks. Mr. Everal is the contractor.

The new Town-hall at Wakefield, erected from the design of Mr. Thos. E. Collcutt, of Bloomsbury, W.C., is to be opened on the 18th of October, the anniversary of the laying of the foundation-stone. The *Wakefield Herald*, in announcing the ceremony, says: A very great deal of work yet remains to be done at the town-hall, especially in the matter of furnishing.

The Salcombe, Devon, local board have elected Mr. Edward Cole, senr., an old resident, as town surveyor and sanitary inspector.

The foundation-stone of a mission-school chapel for the North-end of Great Yarmouth was laid on Monday week. The builder is Mr. Nickerson, of Yarmouth.

A group of coffee-tavern buildings are being erected in the Old-square, Warwick, and will be opened in November. The contractors are Messrs. Green and Sons, of the Butts, Warwick.

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ILLUSTRATIONS.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

UNIVERSITY COLLEGE, LONDON.

We illustrate this week the south front of the new buildings recently erected in Gower-street, and which form the north wing of University College. The main block of the building consists of four lofty floors, chiefly lighted from the north side, of which the two principal are devoted to the use of the students of the Slade Fine Art Schools. These rooms are approached by a handsome staircase in the front of the central block. The lowest floor is devoted to chemical department, and the top floor to the students of physiology; and to these access is gained by a staircase at the west end. In the rear of the main building are also two large chemical laboratories. The building is faced with brown Portland stone, and the carving, both of the interior and exterior, all of which is of a most delicate character, has been executed by Mr. Wynn. The floors throughout have been done by Messrs. Dennett and Co., and the heating-apparatus and chemical fittings by Messrs. Roper and Rupell. Mr. W. Brass was the contractor for the general work, and is also now engaged in completing the necessary fittings. Mr. Heathcote was the clerk of works. The building was erected from the designs of Prof. T. H. Lewis, F.S.A., under the superintendence of Messrs. Perry and Reed, architects to the council, and our illustration is taken from a pen-and-ink drawing by Mr. J. Tavener Perry, exhibited in the last Academy Exhibition.

"BUILDING NEWS" DESIGNING CLUB.—COTTAGE FOR A GAMEKEEPER.

To day we publish the two designs placed second and third for a Gamekeeper's Cottage. We have already remarked upon these designs when reviewing the whole series, and we leave the sketches now to answer for themselves. The design placed first was published in our issue for August 13th last.

ROCHESTER CATHEDRAL GRAMMAR-SCHOOL.

The new school-house for the Rochester Cathedral grammar-school has for its principal entrance a triangular-shaped porch, suggested by the nature of the only available approach to the house, which we illustrate this week. The walling is executed in concrete, faced with red bricks and Kentish rag Boughton-stone in bands, and the porch is groined in rock chalk. Messrs. Perry and Reed, of the Adelphi, W.C., acted as architects for the work to the Dean and Chapter, and Messrs. Vaughan, of Maidstone, were the contractors.

CEMETERY LODGE, SUTTON COLDFIELD.

The Cemetery Lodge and Lych-gate, given in this number of our journal, is built upon the Sutton Coldfield Burial-ground, with red brick facings, timber framing filled in with plaster, and the roof covered with Broseley tiles. Referring to the ground-plan, the "w.c.'s" should have been marked earth closets, and "carriage-way" covered way." The cemetery is only a short distance from the church, and has no chapel in the grounds. The robing-room is planned so that service can be read from the windows, if desired, the coffin and mourners resting under cover. The work has been executed by Messrs. C. Jones and Son, contractors, of Birmingham, from the designs and under the superintendence of Thomas Mr. W. Cutler, F.R.I.B.A., of 5, Queen-street, W.C.

HOUSES, CHRIST CHURCH-ROAD, FOLKESTONE.

These villas are being erected for Mr. N. White, in the Christ Church-road, Folkestone. They are without basements, the kitchen and offices being on a level with dining and drawing-rooms. Mr. E. B. Fowler is the builder, and the architect Mr. Reginald Pope.

ALTAR-TABLE AND GABLE CROSS, ST. JAMES'S CHURCH, LOUTH.

The old table has at some time been altered in the length, and, I think, also in the height The inscription "D. R. joyner, 1630," ought to be in the centre. The chancel cross and other carvings have been made in the famous Ancaster stone. The exposed work is somewhat weathered, and the outlines gently softened by time, but the general contour is perfect, the stone nowhere rotten, and the warm grey colour is splendid where lighted up by the sun. The delicate tracery of the E. parapet and the outline of the cross form a beautiful object in dark clear relief against a western sky after sunset; and we are forcibly impressed by the care and attention paid by the architects of the Perpendicular period to the embellishment and perfection of the sky-line of their buildings.—John J. Cresswell.

CHIPS.

A new Wesleyan chapel was opened at Hartshead, near Halifax, on Wednesday week. It is Gothic in style, and is built of Northowram stone, with Ringsbury dressings, and all the internal fittings are of pitch-pine. The dimensions are 45ft. by 22ft., and accommodation is provided for 250 persons, at a cost for erection of £800.

The Tipton School-board further discussed, on Thursday, the 2nd inst., the threatened litigation for recovery of extras by the builders of the new schools at Tipton Green and Burnt Tree, and motions by the chairman were carried by narrow majorities, the first rescinding the motion appointing Mr. Charles Round as architect and surveyor to the board, the second giving Mr. Round three months' notice to discontinue to act. It was also decided to request the Education Department to send down an official architect to examine the work at the two schools above named and compare it with the plans and specifications, reporting any deviations to the board.

The Wesleyan chapel in Snargate-street, Dover, was reopened on Thursday week, after renovation, reseating, and decoration, carried out by Mr. P. Stiff, builder, of Dover. The cost has been over £1,000.

The foundation-stone of the new chancel now being added to St. Peter's Church, Syston, near Leicester, was laid on Tuesday week. Mr. Frederick W. Ordish is the architect, and Mr. Henry Allen the builder.

Euxton Wesleyan Chapel is now undergoing restoration from the plans, and under the superintendence of, Mr. David Grant, architect, Preston.

Extensive quays and sea defences are being formed at Wexford for the Waterford and Wexford Railway Company. Messrs. Fowler and Ward are the engineers, and the work is being carried out under contract by Mr. Murphy, of Dublin.

The first block of new buildings in the Deptford Broadway, in connection with the scheme for widening that thoroughfare, and the new bridge over the Ravensbourne, is nearly completed, and consists of four shops and dwellings. The shops are divided on the street front by stone piers and brackets, and over a deep stone frieze, three stories are carried up, in red Chilton brickwork, with Beer freestone facings and dressings, dormers being obtained in the high-pitched roofs. Mr. Joseph Wall, A.R.I.B.A., is the architect, and Mr. Edgar Banks, of Lewisham, the contractor.

OLD NEWCASTLE CHURCHES.

A NUMBER of the members of the Newcastle Society of Antiquaries, with their friends, met on Friday last for the purpose of examining certain of the churches in Newcastle and the locality in which were typified a peculiar style of architecture. The muster took place at half-past ten in the forenoon in the Library of the Old Castle. Here Mr. W. H. D. Longstaffe explained the peculiarities of the style of architecture which they were going to inspect. These he stated to be octagonal pillars, from which the arch sprung without any ornamentation, segmental windows, and low-pitched roofs. St. Mary's Church at Gateshead was first visited. Here excellent specimens of the plain, severe, octagonal pillars, depending entirely upon delicacy of proportion for their good effect, were seen. There were also examples of the segmental window, and the roof is low-pitched. After a brief visit to Trinity Church, Gateshead, the party came to St. John's in Newcastle. Here Mr. Longstaffe pointed out what he called the "effeminate" class of segmental windows. The party were next shown a string-course on the exterior of the south-east corner of the nave, adjoining the south transept, which is one of the oldest pieces of Norman work in Newcastle. A variety of objects of interest in the church were examined, and then the company repaired to St. Nicholas'. Here the most perfect form of the low-pitched roof was seen, besides the peculiar style of pillars. Mr. Longstaffe gave a short history of the structure, and in pointing out the numerous interesting features he was greatly assisted by the Rev. Canon Martin. St. Andrew's was the next church visited, and this venerable edifice was prolific in points of interest, in the description of which the Rev. W. B. East gave valuable aid. The church at Ponteland was seen at disadvantage owing to its being at present under repair. When in its complete state it was characterised also by the octagonal pillars, the segmental windows, and the low-pitched roof. As the latter, however, had begun to give way through age, it has been pulled down, together with the north transept. The pillars will be restored as before, but as a high-pitched roof is to be built and the tower considerably heightened, the whole aspect of the church will be changed, and it will be deprived of the hoary, antique, mediæval contour which has hitherto made it such an interesting feature of the district. Having brought the proceedings to an appropriate conclusion by a conference at the historic Black Bird Inn close by—which is the remains of an old castle or peel-tower—the antiquaries and their friends returned to Newcastle.

ARCHÆOLOGICAL.

Missouri.—Mr. George A. Bates, of the Naturalists' Bureau, Salem, Mass., will shortly issue the first of a series of papers on the archæology of Missouri, to be published under the auspices of the Archæological Section of the St. Louis Academy of Science. This important work, entitled "Archæological Remains and Ancient Pottery of Southern Missouri," by Prof. W. B. Potter and Dr. Edward Evers, two members of the society, contains a general description of the South-eastern Missouri district, and the pottery which has been found in such abundance in the burial mounds of that region, and is illustrated by twenty-nine full-page lithographic plates.

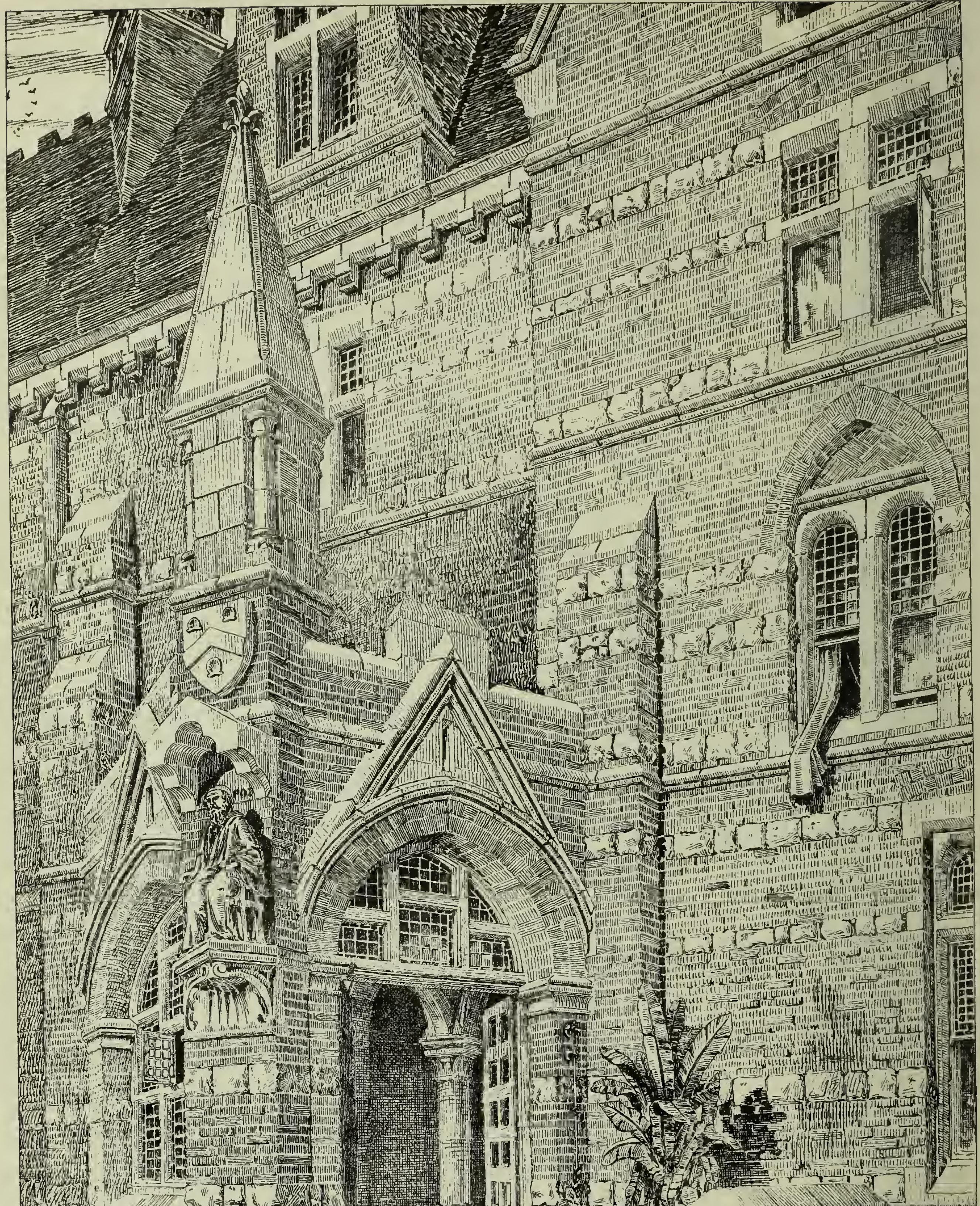
COMPETITIONS.

Limerick Water Supply.—The Corporation of Limerick City opened on the 2nd inst. plans and estimates from thirteen engineers in response to advertisements inviting schemes for the supply of a million gallons of water daily. The plans are all marked with the name and address of the competitor, and the corporation have decided to hang them in the council chamber for public inspection for 14 days—till Thursday next—between the hours of 10 a.m. and 3 p.m. The amounts of the estimates, which vary from £18,000 to £97,400, are given in our list of "Tenders."

◆

A new Established Church was opened on Sunday week, at Strathfillan, Perthshire, opposite the site of the ancient chapel of St. Fillan. It is Gothic in character.

LIBRARY



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ROCHESTER CATHEDRAL GRAMMAR SCHOOL. SCHOOLHOUSE PORCH.
J. TAVENOR PERRY ARCHITECT

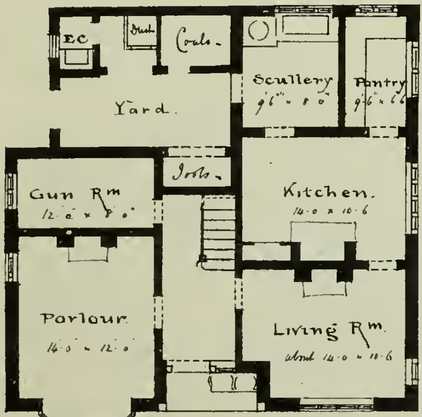
— "Building News" Designing Club —

— Cottage for a Game Keeper —

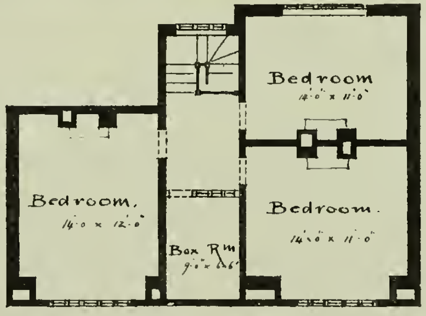
DESIGN · PLACED · SECOND ·

Edwin

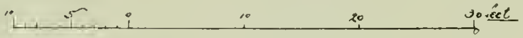
Materials - Walls of a bright red brick - vertical tiling also of a good strong red. roofs to be of a slightly deeper toned tile. Woodwork - quite plane



Ground Plan.



Bedroom Plan.



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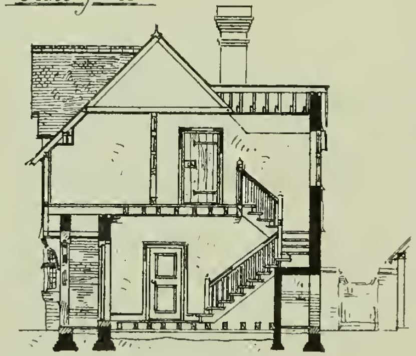
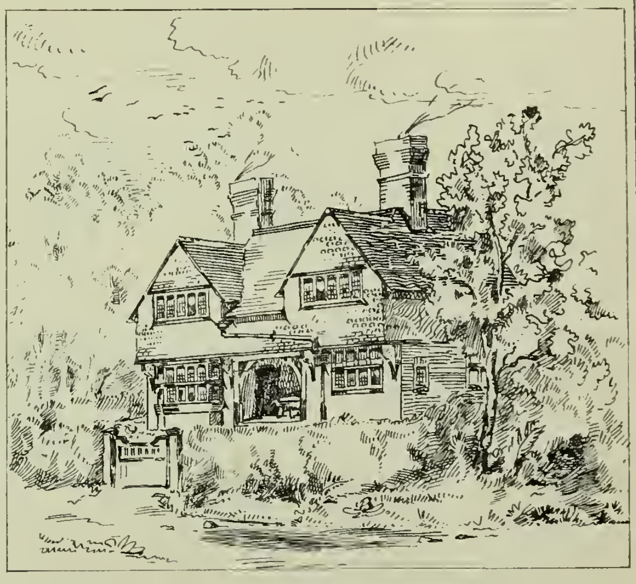


Section.

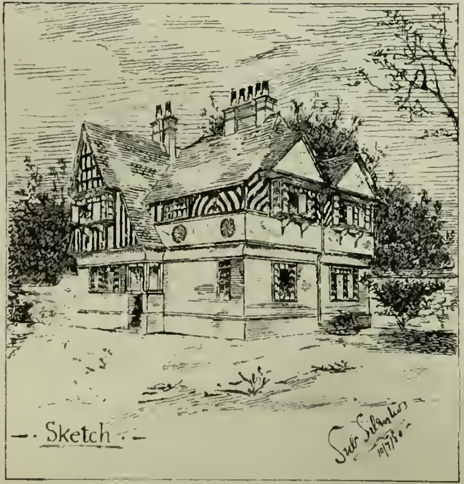


Building News

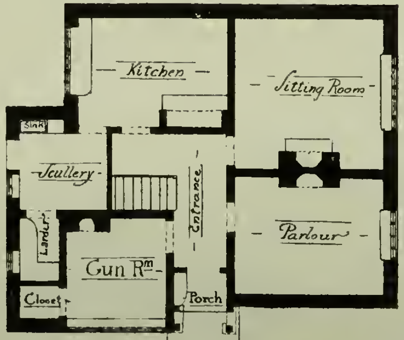
Designing Club.

A Game-keeper's Cottage

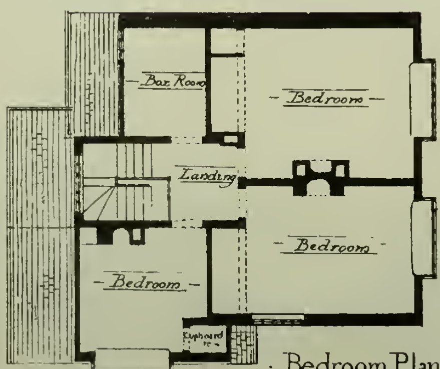
· DESIGN · PLACED · THIRD ·



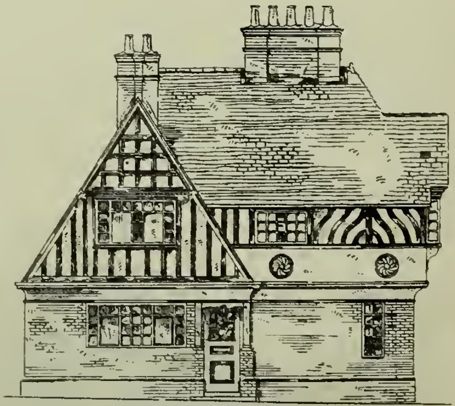
— Sketch —



— Ground Plan —



— Bedroom Plan —



— Elevation —

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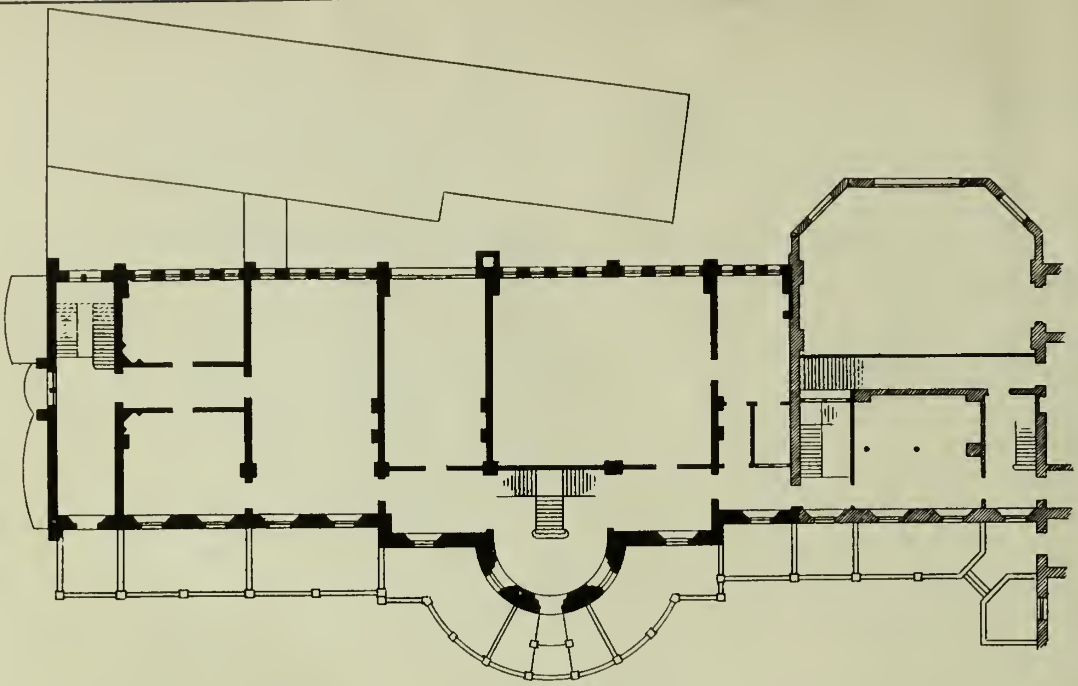
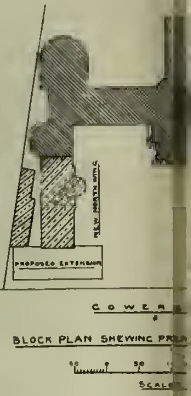
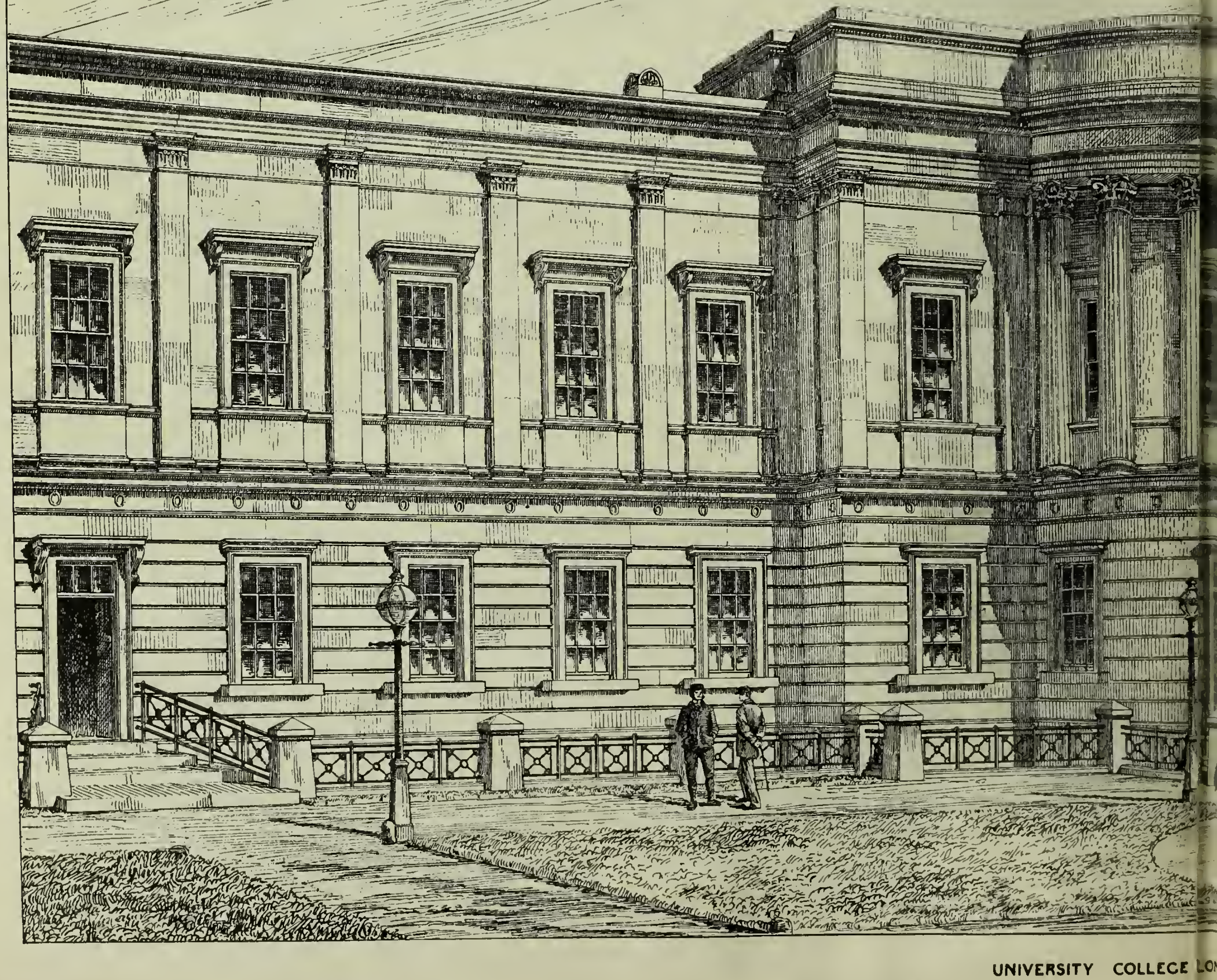


GROUND FLOOR PLAN



BLOCK PLAN SHEWING PR



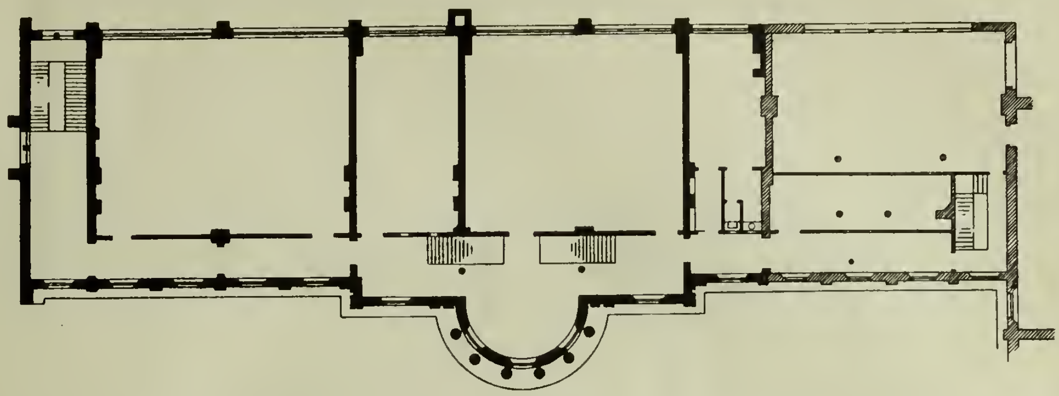
UNIVERSITY COLLEGE LO

DESIGNED BY PROFESSOR T. HAYTER LEWIS F.S.A.

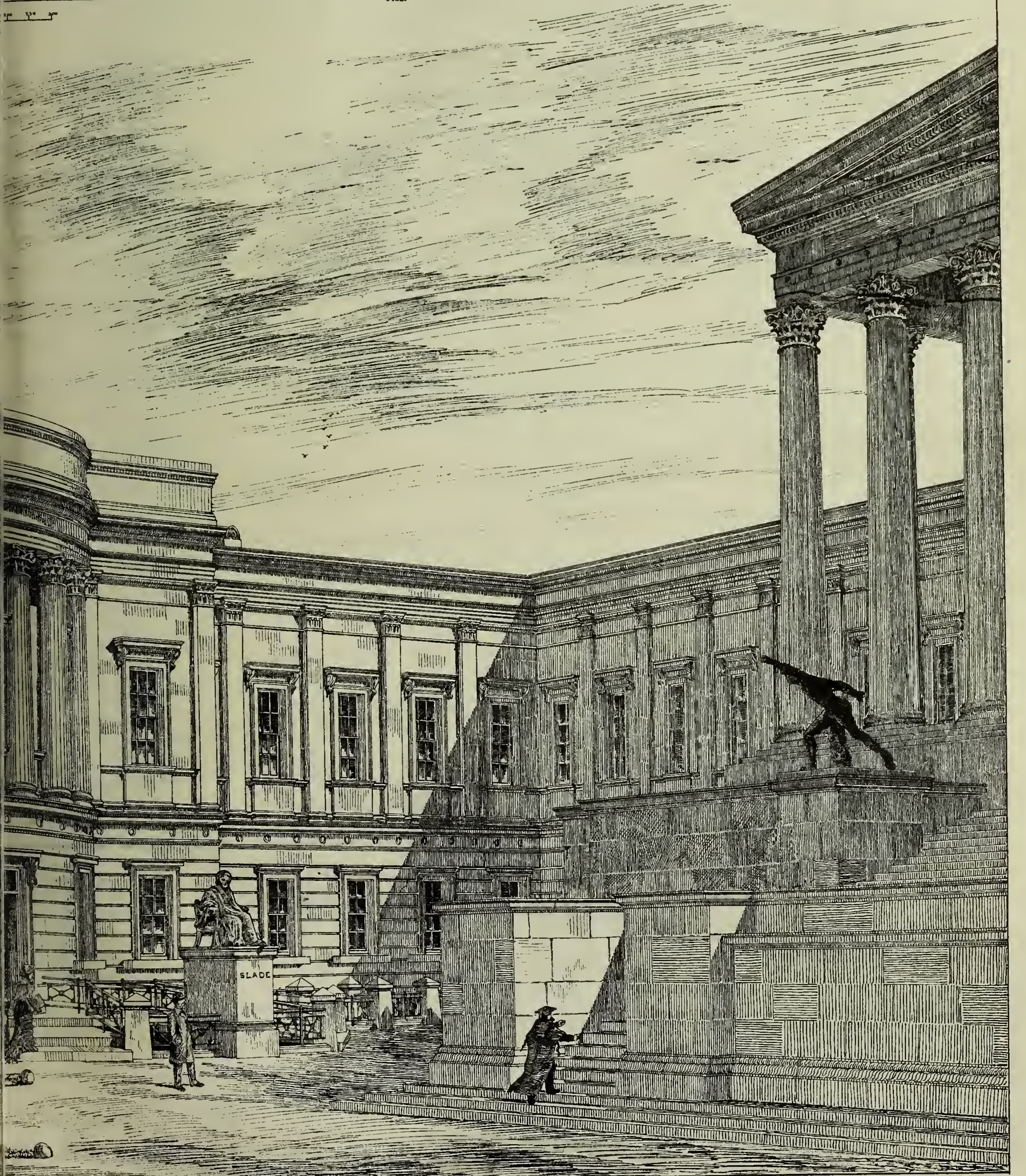
Sep 10 1880.

EET

PROPOSED EXTENSIONS



FIRST FLOOR PLAN



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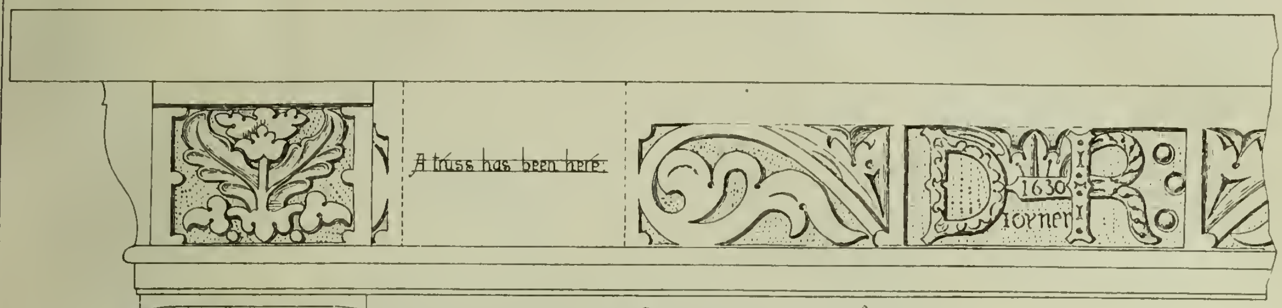
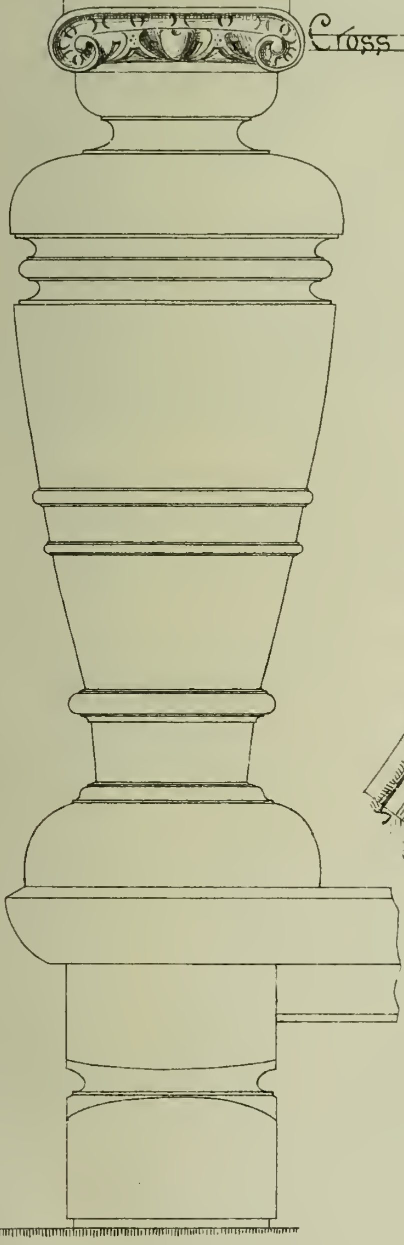
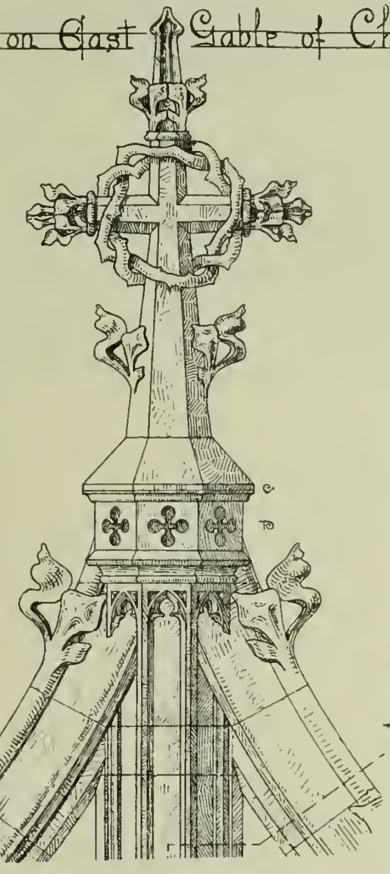
DON NEW NORTH WING

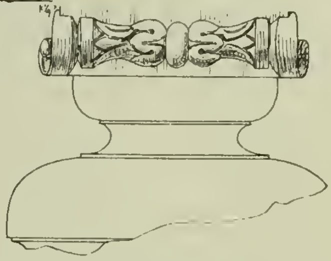
MESSRS PERRY & REED ARCHITECTS



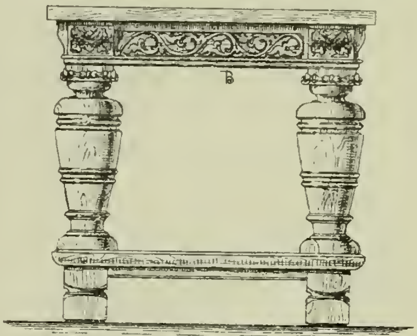


Cross on East Gable of Chancel.

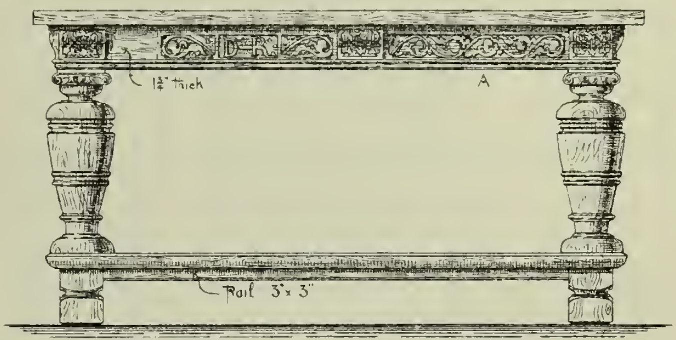




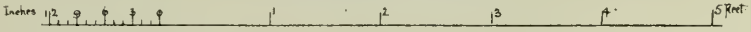
Side View of Cap of Leg



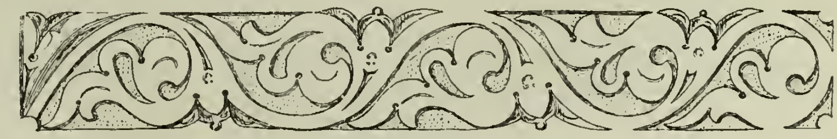
End of Table.



Front of Table.



Old Altar Table in S: James' Church: Louth.



Ornament at A and B.

All details are from full size drawings made on the spot.

John J Cresswell del

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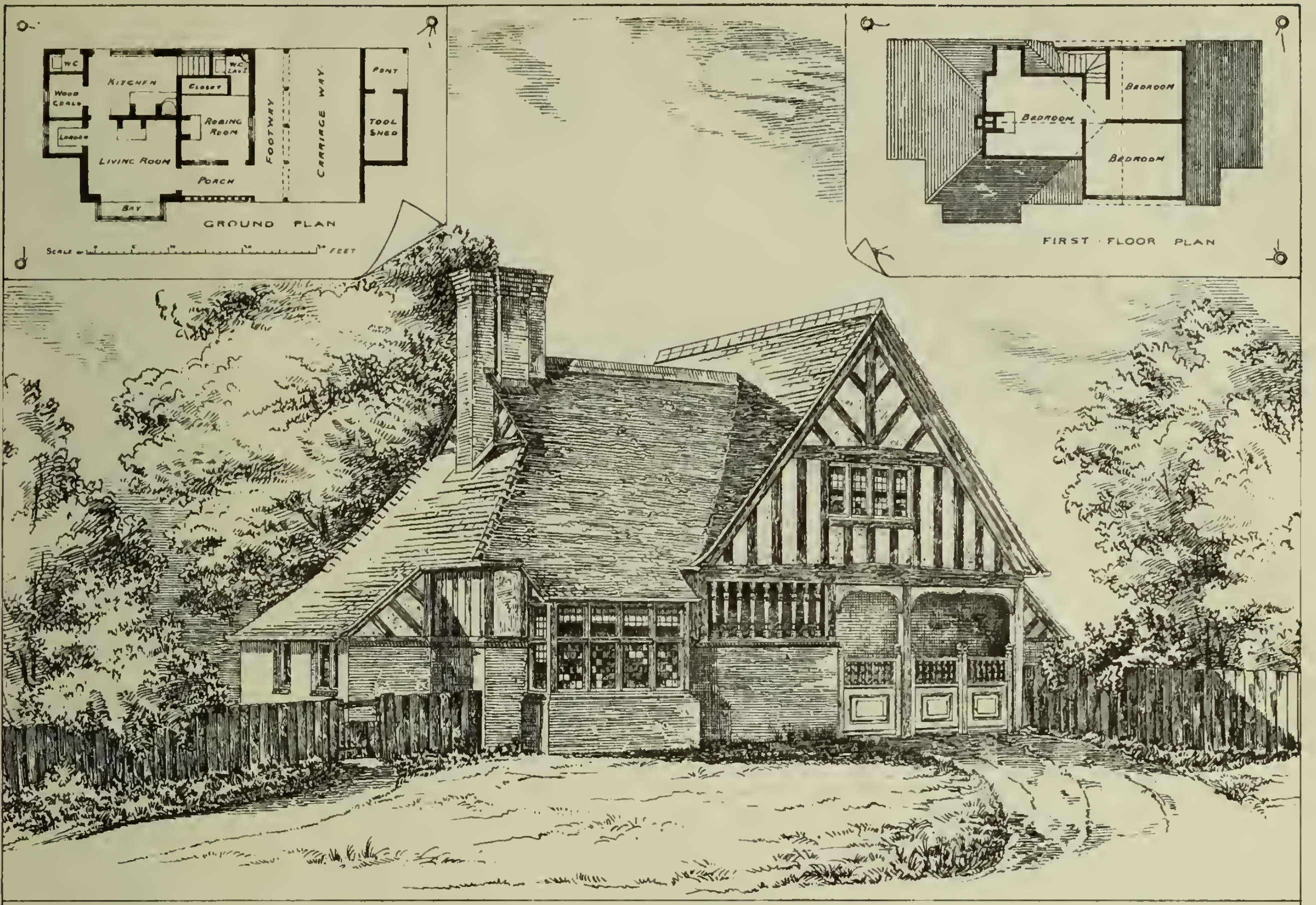
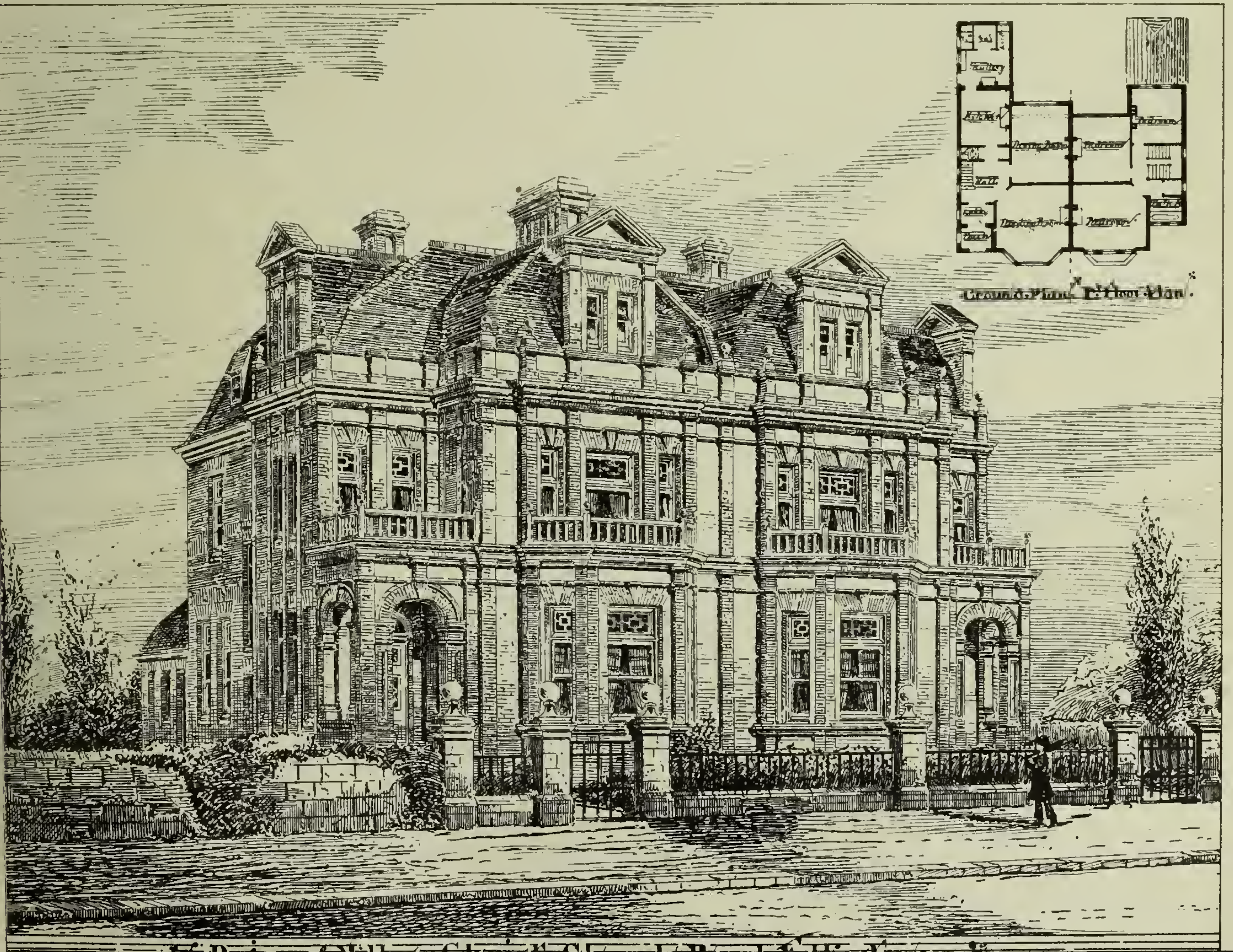


CEMETERY·LODGE·&·LYCH·GATE SUTTON COLDFIELD.
THOS W. CUTLER ARCHITECT



A·Pair·of·Villas·Christ·Church·Road·Folkestone· REGINALD POPE ARCHT

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COLOUR IN GREEK SCULPTURE.

AT first sight, says a writer in *Blackwood's Magazine*, to those who have given no special attention to the subject, the idea of laying colour on the virgin purity of Pentelic marble is certainly repugnant. But a little consideration, and, I might add, a little more faith in such perfect masters of artistic taste as the Greeks have otherwise shown themselves to be, may modify this first impression. In the first place, the delicate ornamentation in which, at any rate Ionic buildings abound, would without the aid of colour, be in many cases lost upon an observer standing below; while, without such aid, elaborate compositions, like the frieze of the Parthenon, must in the situation selected for them, have lost greatly in value. But there is another point which at once strikes the traveller who stands beneath an Attic sky, and is brought face to face for the first time with the actual conditions under which the Greeks worked. This is, that the intense clearness, one might almost say radiance, of the air makes it impossible even to look at a white glittering substance like marble, except through some medium, such as smoked glass. What, then, would have been the use of a Greek sculptor lavishing his skill and invention upon works of which, when exposed in open air and to public view, only the general effect could be appreciated, while the grace and delicacy of design and execution upon which he prided himself was lost in the glare of sunlight? If the Greeks were an artistic nation, they were also an eminently practical one; and I can hardly think that they would have been content with such disproportion of means to ends, of labour to the result produced. Need we wonder, then, that they took the most obvious means of overcoming this difficulty? Let any one walk in the glare of noonday past some of the new houses which the Athenians of to-day have decorated with bare marble, and say whether these men or their ancestors of twenty centuries ago best understood the proprieties.

THE ALLEGED DECADENCE OF ENGLISH SCULPTURE.

IT would seem, says a writer in the *Cornhill Magazine*, as though comparatively few people had observed that the general revival of the arts amongst us has extended to the domain of sculpture. In the face of an annual exhibition, gradually but surely increasing in merit year by year, we are constantly confronted by the dictum that sculpture is dead in England. Whenever English sculpture has breathed strongly after one of its periodical trances, whenever it has stretched a limb or fluttered a pulse, criticism has hastened to assure it that it is as dead as a door-nail, and should permit itself to be borne decently and swiftly to the tomb. Thus encouraged, it is not wonderful that it fails to gain strength, or to throw off the sluggishness consistent with so complete a hypochondria. Sculpture is not dead in England, let us distinctly say; but whose is the fault if it appear to be so? The fault would seem to lie with three responsible bodies, each charged with the duty of observing and encouraging contemporary art—the public, the critics, the Royal Academy. Each of these can hardly be acquitted of a determined neglect of the interests of sculpture, and each has had a reflex influence in prejudicing the other two. The body of which artists complain the most, and which has, in fact, less fault in this particular case than any other, is the Royal Academy. The painters do not depend wholly upon the annual show at Burlington House; it is but the largest and most important of a variety of exhibitions at which, throughout the year, the public is invited to observe their productions. Some of the most celebrated painters of our day have never exhibited at the Royal Academy, and have successfully summoned their admirers around them at other galleries. But the sculptor has no public audience except at Burlington House, and the critic who desires to follow the progress of sculpture in England has no means of doing so except by a careful study, year after year, of the three rooms devoted to that art at the Academy, which becomes in this way the sole medium between the public and the sculptor. With all their faults it cannot be said that the Academicians have ever denied the dignity of this particular art. They have given it a measure of encouragement in their schools, they have admitted its followers to a fair share of the honours of their foundation, and above all, whatever resistance has been made to the endowment of false and meretricious popular work has been made by the Academy. Where a just complaint may be brought against the Council, is in the matter of the space allotted to the works in sculpture year by year. When the Academy first arrived in Burlington House, so few works in this branch of art were exhibited that the three rooms, or rather two rooms and a half, were by no means unduly crowded. At present, on the contrary, the crush is very great, and most injurious to the effect of each individual statue, which, drawn so close as it is to two uncongenial neighbours, is apt to lose much of the harmony of its proportions. The whole principle upon which works of sculpture are now arranged at the Academy is injudicious. The long, flat line of busts set close to one another on a ledge halfway up a blank wall is one of the most uncomely features of the whole exhibition, and the arrangement by which weary visitors are encouraged to sit and rest with their backs to the principal statues in the Central Hall must surely be the grim pleasantry of some elderly painter of past times. A few ottomans cosily arranged *dos-à-dos* with Sir Frederick Leighton's nymphs, and a sofa wheeled up against Mr. Poynter's "Æsculapius" would form the best possible comment on the present manner of treating sculpture in the Academy. Every one remarks the ease and comfort with which sculpture is seen in the garden of the Salon, and may ask why the Royal Academy is unable to contrive something more creditable to its fine rooms than the present array of "wall-flowers" in marble.

OBITUARY.

MR. JOHN HENRY HAKEWILL, architect, of 5, South Molton-street, W., died on Monday, the 30th ult., at his residence in Inverness-terrace, Bayswater. Mr. Hakewill, who was in his seventieth year, was a pupil of his father, and had been long connected with the profession, and so far back as 1854 was elected a Fellow of the Royal Institute of British Architects.

We also have to record the death of Mr. Charles Williams Lee, F.R.I.B.A., the senior partner in the firm of Lee, Sons, and Pain, and one of the principal surveyors and valuers in the metropolis. Having passed some years with Mr. T. Cubitt, the builder, Mr. Lee became an articled pupil in the office of Mr. John Nash, and afterwards went into partnership with Mr. James Morgan, an engineer, with whom he designed the old Haymarket Theatre, and constructed the Regent's Canal. He was afterwards in partnership successively with the late Mr. Duesbury and the late Mr. T. Talbot Bury, V.P.R.I.B.A., and since 1866 with his sons and Mr. W. Pain. Amongst his later works may be named the rebuilding of Her Majesty's Theatre, in the Haymarket, in 1868-9. Mr. Lee had been obliged to relinquish business for several years past, and died at his residence, West-hill, Putney-heath, on Saturday week, aged 75. We illustrated a house at Putney designed by the firm on Nov. 12, 1875, and subsequently the fireplace at Heathfield House, Putney-heath.

The death is announced of a veteran German artist, Hermann Anschutz, who died at Munich on August 30, having just completed his 78th year. He was one of the most esteemed painters of the Cornelius period, and one of the most distinguished pupils of that master. Having studied under Hartmann in Dresden and Cornelius at Düsseldorf, he gave as the first specimen of his talent the picture for the ceiling of the Odéon at Munich, representing the judgment of Midas, painted when he was only 28 years of age. The King of Bavaria, Louis I., was so pleased with this that he sent the young artist to Italy to study the remains of ancient painting in the Museo Borbonico, and at Herculaneum and Pompeii. Returning to Munich, Anschutz executed a series of frescoes and encaustic pictures in the Royal palace in the ancient style, after designs by Leo von Klenze and Zimmermann. In this work he was partly assisted by Nilson and Hiltensperger. He subsequently resumed oil-painting with most brilliant success. Forty years ago he was made Professor of Painting in the Munich Academy of Arts, a post which he resigned in 1872 on account of enfeebled health.

Mr. Charles P. Hartshorn, an architect in active practice in Providence, R. I., and Secretary of the Rhode Island Chapter of the American Institute of Architects, died of cerebro-spinal meningitis, on August 14, at the age of forty-seven years. Mr. Hartshorn devoted himself to architecture from the day he entered the office of the late Thomas A. Tefft (who died in Florence, December 12, 1859, age 32 years), about thirty years ago, until within a few days of his decease; and, in all these years he was seldom absent from his work, even for a day at a time. His loss will be felt very keenly among his fellows in the profession, because of his devotion to its interests, and although his successor may soon be elected, it will be difficult to find one to *fill* his place, as Secretary of the Rhode Island Chapter.

CHIPS.

The contract for laying street tramways in the city of Bath has been taken by Mr. A. Krauss, of Colston-street, Bristol.

The Yarmouth Port and Haven Commissioners are having a concrete sea-wall made at Gorleston, Suffolk, under the direction of Mr. Teasdel, their deputy engineer; but adverse to the advice of his superior, Sir John Coode. The wall is being built in frames, a considerable distance from the cliffs, with the expectation that high tides will fill the interval with shingle, and so protect the cliffs.

The plans for the new post-office for Plymouth, about to be erected in the Guildhall-square, have been submitted to the town council by Mr. Rivers, the surveyor to H.M. Board of Works. The style is Gothic, harmonising with the adjacent building in the square; and the works will be commenced early in the spring.

The patent office of Rouge Croix Pursuivant in the Herald's College, London, vacated by the promotion of Mr. S. I. Tucker to be Somerset Herald, has been conferred on Mr. Henry Farnham Burke, eldest son of Sir Bernard Burke, Ulster King-at-Arms.

The parish-church of Newton Abbot, Devon, was reopened on Sunday week, after the addition of a new organ-chamber and vestry. The work has been carried out by Mr. C. Stevens, builder, of Newton Abbot.

Mr. G. C. Haddon, the architect, informs us that Beer stone, not *Bath* stone, as stated last week, was used in connection with the erection of the new church of St. Ann, Eastbourne.

Two men, named Finch and Durrant, were at work restoring the roof of the parish-church of Stanningfield, Suffolk, on Thursday week, when the supports gave way, and they fell into the church, the former breaking an arm and leg, and the latter a collar-bone.

The town council of Dorchester discussed the subject of sewerage and sewage disposal on Monday, and decided not to adopt the Aylesbury or any other public company's plan, but to work out a scheme for themselves. By a majority of 6 to 3 the borough surveyor was instructed to prepare plans on the precipitation system.

On Saturday last, the foundation-stone for a second Board-school was laid at Morley. The school will cost £6,000, and will be built in the Early English style, with local pitch-faced wall-stones, with boasted dressings, the roof being covered with Westmoreland slates. It will be divided into three departments, to accommodate 270 boys, 270 girls, and 210 infants. The work has been let in one contract to Messrs. Obank and Son, of Idle. The architect is Mr. J. Sykes, of Morley, and the clerk of works Mr. J. T. Brown, of Leeds.

New Board-schools were opened on Monday by the Ystradyfodwg School Board at Mardy, a new village in the Rhonda Vach Valley. The schools will accommodate 300 children, and, with playground, occupy half an acre of land. The architect was Mr. John J. Evans, C.E., of Treorky, and Mr. W. W. Phillips, of Haford, took the contract for erection at £1,500.

A new gasometer is being constructed at the Gorleston and Southtown gasworks, Yarmouth. It is 200ft. in circumference, and rises to a height of 45ft. from foundations, which are of bricks, set on a 2ft. layer of concrete. The floor and walls are of cast-iron plates, and the sliding roof is carried on a central square pillar of trellised iron, 22ft. high and 2ft. square, with eight tension-rods, and numerous ties and braces. The capacity for gas is about 60,000 cubic feet. Messrs. S. Cutler and Sons, engineers, of Millwall, E., are carrying out the contract.

Building Intelligence.

Dublin.—On Wednesday week the chapel of St. Columbus' College, Rathfarnham, Dublin, was dedicated. The internal dimensions of the chapel are 80ft. in length, 28ft. in width, and 40ft. in height; with the addition of an organ transept on the south side, and a porch and bell turret at the north-west end. This porch stands in direct line with the cloister built by the late Primate in 1852, which is intended to be carried on up to the chapel at some future time. The chapel stands at right angles to the hall and schoolroom, and is elevated on a terrace cut in the slope above the other buildings. The exterior walling and quoins are of dressed granite, quarried in the college grounds, with Bath stone at intervals for bands, string-course, and copings, and for windows. The style of the building is Early Decorated. The chapel is intended to seat 155 persons. The ante-chapel, and the central passage of the choir, which is from 8ft. to $10\frac{1}{4}$ft. wide, and the sanctuary, are paved with Minton's tiles, in black, red, grey, yellow, and buff colours, semi-glazed and unglazed. The side walls and western wall are faced with the same to a height of 5ft.; and the reredos consists of moulded Bath stone, rising from a slab of dark grey fossil marble, arched in relief over coloured tiles in a mosaic pattern. The sedilia and the credence table are similarly treated. The alabaster pulpit has been removed from the old chapel and refitted. The leetern, of Caen stone, has been refitted also, and mounted upon a solid block of green marble. The roof is of Memel fir, stained a light colour. A series of stained-glass windows has been designed by the architect, of which several are already executed. The cost of the building has been £6,400, independent of special gifts, the value of which is very considerable, and apart from sundry items, the cost of which has not yet been ascertained. The chapel was designed by Mr. Butterfield.

Fort Augustus.—On the 24th ult. the completed Monastery of St. Benedict, Fort Augustus, was opened. The foundation-stone of the College was laid by the Marquis of Ripon in September, 1876. The buildings were proceeded with with great rapidity, and in 1878 the College was opened. The buildings now completed consist of the monastery, which has accommodation for forty or fifty monks; the hospice, which is divided into twenty-four rooms; and the college, with dormitories, halls, and class-rooms, calculated to accommodate about 100 pupils. These buildings occupy the three sides of a quadrangle, the remaining side being only closed in by the cloisters, and from the centre of it an arch opens into a fine scriptorium, supported by central arches. This is the south side of the quadrangle, and the intention is to erect here at some future date a branch to the cloisters, with an octagonal chapter-house and a church. The north side of the quadrangle is taken up by the college, the west side of the hospice, and the east side by the monastery. Inside the quadrangle are the cloisters, designed by Messrs. Pugin, of Westminster. These are Early Decorated Gothic. A spacious open ambulatory, accessible from the first floor of the monastery, occupies the roof of the cloisters. The passage floors are of tiles, while the wood works inside are chiefly of pitch pine and oak. The whole buildings, as already completed, represent an expenditure of about £65,000, and the entire buildings contemplated are estimated to cost about £100,000. The cloisters alone have cost £7,000, and the scriptorium cost about £1,000. The works have been conducted under the direction of the Benedictine Fathers, by tradesmen under the immediate charge of a clerk of works, the present clerk of works being Mr. Andrew Cruickshank, a Banffshire man.

Irlams-o'-th'-Height.—The foundation-stones of a new Wesleyan chapel, to take the place of the old one, which was seriously injured by fire, at Irlams-o'-th'-Height were laid on Saturday. The new building will stand on the site of the old one, near the junction of the Swinton and Pendlebury roads, and accommodation will be provided for 550 people. Internally it will measure 68ft. by 44ft., the height to the ceiling being 34ft. The chapel will be Gothic in style, with centre gable towards the road and large traceried window over the entrances. The contract has been let to Messrs. R. Neill and Sons for £2,450. Mr. R. K. Freeman, of Bolton and Derby, is the architect.

Maidstone.—A new Roman Catholic Church erected in Week-street, Maidstone, will be opened in the early part of next month The building consists of a nave with aisle at each side, about 60ft. long and together about 42ft. wide; a chancel, side chapel, organ-chamber and sacristy, 25ft. long and together 40ft. wide, the end of the chancel being apsed. A tower which forms one of the entrance porches is attached to the westernmost bay of the south aisle, and there is another porch at the west end of the north aisle. The style adopted is Geometrical Decorated, the building being constructed of red bricks, with Bath stone bands and dressings. The architect is Mr. C. G. Wray, of Regent's Park. The contractor is Mr. J. G. Naylar, of Rochester. The carving is by Mr. Boulton, of Cheltenham. The altar is the work of Messrs. Vaughan Bros., of Maidstone.

Milverton.—The parish-church of Old Milverton, near Leamington, was reopened on Thursday, the 2nd inst., after entire rebuilding except the base of tower. The church now consists of nave, 30ft. by 20ft., with north aisle 30ft. by 10ft., chancel, 25ft. by 15ft. The style is Early English. The walls are of local stone from Lady Percy's quarries, and the quoins and tracery are of Hollington. The nave and aisle roofs show the timbers with plastering between, that over chancel being of varnished pitch-pine. The whole of the seating and other fittings are of oak, waxed and polished. The chancel is paved with Minton tiles, and the nave and aisle with Peake's terra-metallic tiles; the heating is by hot-water pipes. There are six memorial stained-glass windows. The reredos and font have been executed from the architect's special designs by Messrs. Mabey and Co., of London. Near by is a new vicarage house. A new organ is about to be built by Hill, of London. The architect for church and vicarage is Mr. John Gibson, of London; the contractor Mr. G. F. Smith, of Milverton, who recently built the church of St. Mark at New Milverton. The entire cost has been about £7,000.

Oldham.—The additions to the Olham School of Art are now completed. The School of Science and Art is built in the Classic style, and the cost of the additions now made will be between £7,000 and £8,000. The building consists of the following departments:—On the ground floor: Machine drawing and practical plano and solid geometry department (three rooms), 42ft. 9in. by 20ft., 42ft. 6in. by 28ft. 6in., and 42ft. 6in. by 27ft. 6in.; office and master's room, 20ft. by 16ft. 9in. First floor: Mathematics (two rooms), 43ft. by 20ft. and 42ft. 6in. by 28ft. 6in.; mechanical drawing, 42ft. 6in. by 27ft. 6in.; physical laboratory, 25ft. by 20ft. Second floor: Building construction, 41ft. 3in. by 28ft. 6in.; chemical lecture-room, 41ft. 3in. by 20ft.; art, 41ft. 3in. by 27ft. 9in.; and chemical laboratory, 25ft. by 20ft. The premises are provided with the latest scientific improvements, and are tastefully fitted up. They are heated by hot water, and very effective arrangements have been made for ventilation, the whole of the foul air being carried away by a powerful extraction shaft. The work has been executed from the designs and under the superintendence of Mr. George Woodhouse, architect, Bolton, and Mr. Edward Potts, architect, Oldham.

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CHIPS.

It is officially reported that more money has been expended this year for new buildings and substantial repairs and improvements in New York city than at any time since 1873. The returns of the Department of Buildings for the six months ending July 1 show that 1,100 new buildings have been commenced, at a total estimated cost of 14,800,000dols., or nearly 13,500dols. for each. This is 3,000,000 dols. more than was expended for these objects in the same period of last year, and double as much as in 1877.

Mr. C. T. Gomoszynski, assistant in the surveyor's office at North Shields, has been elected borough surveyor and engineer for the town, at a salary of £300 per annum.

The parish-church of Llangeinor, near Blackmill railway station, Ogmore Vale, was reopened on Monday after restoration, including partial rebuilding of walls, new windows, and reseating.

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Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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A. Seymour. (Any of the following are "sympathetic" or invisible inks:—Rose colour: Write with a solution of cobalt in spirit of nitre. Green: Mix solutions of nitrate and chloride of cobalt and chloride of copper. Yellow: A solution of muriate of copper. Blue: A solution of pure muriate of cobalt. These all appear on the paper when heated and disappear if allowed to cool in a moist atmosphere.)—J. Leaming. (We think your statement had better be published in the journal in which your papers appeared. At any rate, we hesitate to insert it, as it might involve an action for libel.)—H. J. Pywell. (We prefer not to recommend makers, but we have no doubt Messrs. F. W. Reynolds and Co. would supply your requirements, and advise you as to the machine most suitable.)—A Subscriber, H. C. (No satisfactory method, but try drying the spots well and brushing off, then bleach with a weak solution of chloride of lime applied with a pencil, drying off carefully with blotting-paper and a hot iron.)

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Correspondence.

QUANTITIES.

To the Editor of the Building News.

Sir,—Resuming, by your kindness, my remarks on "Quantities," I now come to other points in the paper by Mr. Hughes where I differ from him, and whatever may be said by builders and others, it will be a black day for architects when they permit the right of taking out quantities, either by themselves or properly qualified deputies, to be filched from them.

The author of the paper under review says, "That he only knows one line of argument in favour of an architect acting as his own quantity surveyor, viz., that no other person can know so well as himself what are his requirements, as shown and described by his plans and specifications, nor is any other person likely to know what changes take place requiring measurement as the work progresses. At first sight, to a novice, this argument appears plausible, and with a first-class architect, it may be made to work tolerably well." Now, evidently, he is anxious to convince us (and we are not all novices) that his argument is sound, for mark, it is said, that the practice with a first-class architect may be made to work tolerably well. But it is a fact that this reprehensible custom works exceedingly well for the proprietor; for then the builder only receives the actual value of the work he executes, and that is where the sting lies; anxious for extras, they yet do not care for deductions. There is, however, another advantage on the side of the architect who takes out his own quantities. He knows how faithfully they are taken, and is thereby enabled to advise his client, and can tell whether the tenders which may be sent in are *bonâ fide* or "cooked." It was no uncommon thing here in Liverpool, a year or two ago, for builders to arrange their tenders, and thus any advantages which could be reaped from honest competition were ruthlessly shunted aside. So largely was this practice carried on, that some architects who took out their own quantities also priced them, adding a fair and reasonable margin of profit for the contractor, and thus they were enabled to judge if that discreditable custom had been adopted. I know a builder who lent himself in an evil hour to that system; but who afterwards reconsidered his position in the matter, and repented. For stepping back into the paths of duty, he received a pitiless castigation from some of his brother-builders. How can an architect, if quantities are taken off outside his office, know whether they actually represent the plans and specifications, or are taken out in a most liberal manner, to the unbounded delight of the builder, and if so fully taken out, at whose cost is it? Why, in the Building News an instance was given but lately, where the frontage was greater than shown on plans, and when the builder preferred his claim for the extra, it was successfully resisted. Had the work been remeasured and valued, we might have witnessed the boiling of a pretty kettle of fish; but contractor, like a wise man, perceived "discretion" to be "the better part of valour." But there is yet another advantage gained when the architect takes out his own quantities. It assists him most materially in maturing his plans and perfecting his specification. It is a training which every architect ought to strive after in self-defence, as well as in his client's interest. It gives him a grasp of the work in hand which cannot be successfully attained by other means, and it enables him to meet the builder on equal terms on his own ground. I therefore think that only a novice will be deceived by such an *ad captandum* argument as that advanced by our author, and thus I hold that architects should be perfectly competent, and are quite justified in taking out their quantities. The hard-headed folks here in the North too often expect architects to be "Admirable Crichton's," and they almost invariably want to know what the work will actually cost. Well, it may be possible to arrive at the cost approximately; by allowing a certain sum per supl. yard, or by cubing, one may come somewhere near the mark; but the road to certainty is to prepare quantities and price them.

Proceeding still further, the author says, "the architect, as a rule, looks upon himself as the servant of his client only," and a little lower down, "where the architect is young in the profession," he is "more subject to the influence that may be brought to bear upon him by his client." We here see the cloven foot peeping out under a flowing dress. Does he wish architects to consider themselves as builders' servants, and simply to register their doings? Why, that is even going beyond the attempt to dictate to proprietors and architects, who shall be the clerk of works on a building. The architect is really the agent of the client retained to watch over his interests. But there is another side to the latter part of the word-painting held up to our view, and I think the obverse may hold equally good. The builder may use his knowledge and influence to the prejudice of the client. He may pose as the friend, adviser, and mentor of the young architect, and obtaining a hold over him, pretend to take the greatest interest in the object of his solicitude. In many cases this interest degenerates into £. s. d., and in the zeal to grow rich, professions and protestations are eaten up. It is wonderful how assertions even, when boldly stated by a skilled hand, if turned round and examined, vanish into mid air, and leave but a faint trace behind them of their previous existence.

In another part we have at "C" a statement made which has not received due consideration. It is there propounded that "An architect in good practice has the usual daily routine of duties to attend, which will necessarily prevent him giving the sole and undivided attention which is absolutely necessary while the process of abstracting quantities is proceeding, otherwise errors of a more or less serious character are sure to occur; nor can a measurer's duty be properly delegated to assistants, any more than can the heavy, responsible duties of eminent physicians or lawyers be delegated to unqualified clerks." But gently: is this not proving too much? Here is a "new Daniel come to pronounce judgment." Pray, why cannot these duties be delegated to assistants if they are quite competent to perform them? Are heavy, responsible duties undertaken by eminent lawyers always well performed, and is the advice they give always sound? If so, it is a singular thing that so much litigation should always be going on in our law-courts. It may be admitted that occasionally even an unqualified clerk would have given sounder advice on disputed points than the eminent professional. But does a builder not delegate the preparation of very elaborate joinery or masonry to the hands of workmen (and there is nothing improper in so doing)? Why, then, should it be wrong in the case of the architect? Suppose architects demanded that a piece of specific work in bricklaying, masonry, and joinery should be undertaken and executed solely by the contractor himself, what a pretty stew even our author, with all his abilities, would find himself in; and the one demand is just as reasonable as the other. I admit having propounded a *reductio ad absurdum;* but yet it is not more absurd than what has been advanced by the writer of the paper I am dealing with. One would suppose, from the words used, that abstracting quantities was the most difficult part of the work; but here our critic's knowledge is all at sea. If the items are plainly written down in the quantity book, no such mistakes as it is asserted must take place can occur; and I assert from practical experience that I consider abstracting to be the easiest part of the work. I may fairly hoist him now with his own petard and leave him there.

Regarding the question of payment of quantities, there are three plans adopted here: with some the charge is included in the estimate, and the amount is paid over by the builder when he receives the first instalment; with others the charge is added to the estimate, but the amount is paid over direct by the proprietor; and there are others who charge it directly to their clients. The last method is most decidedly the best, although the second has a good deal to recommend it; the first has only custom in its favour.

The gist of the paper which I have but imperfectly looked at is evidently intended to limit architects to the preparation of plans and specifications; but what a fix many builders would be in if architects rounded on them, and said, "We will have nothing to do with builders who prepare plans, and in many cases speak most disparagingly of us. Nor shall we have any dealings with those contractors who put lime rubbish from old buildings amongst new mortar instead of sand, and assert that it is good; who build rotten, defective, or broken bricks into pillars intended to carry a great weight; who set stone which speedily crumbles away, and who lay fungoid timber in walls. That would be carrying war into the enemy's camp with a vengeance, and would spread the wildest consternation in their ranks. Would builders then make up a goodly band, when they met architects, to take into consideration the best means of ridding themselves and the world of "impostors"?

I now leave the breach open for those more interested than I, in attacking or defending the paper I have criticised to some extent.

Like Hal o' the Wynd, I may again plunge into the *melée* when it waxes fiercest, and like he, fight for my own hand; but a silent mentor bids me halt, and brings to my mind the quotation, "Nemo mortalium omnibus horis sapit." To our author I would just say, Peg away till the evils which exist are removed. He is anxious to obtain good honest work. So am I. When the "Antidote" is read at the next meeting of master-builders we may again meet in friendly converse.

There are two slight errors in my last letter, which you will kindly allow me to correct. I suppose it is traceable to my own careless penmanship. In the middle column, page 286, lines 46 and 47 from the top, it reads as follows, viz., "the uppermost, 45ft. of the lower," whereas it should have been "the uppermost 45ft. of the tower." In the same colume, line 15 from the bottom, the mistake occurs in the figures "3 to 1." What I intended to show was the amount of work on the faces of the different scantlings of stone, and that the thinnest in its respective value over the others was in the ratio of 3, 2, and 1.—I am, &c.,

Liverpool, Sept. 4. Edward Reid.

THE DESIGNS FOR THE NEW TOWN-HALL OF GLASGOW.

Sir,—The subject which during the last four months has most fully engaged the thoughts, and most powerfully excited the interest, of the civilized parts of the population of Glasgow—and be it understood that in this description I include no Philistines—has been, not the Eastern question, nor the Irish Land question, nor Mr. Gladstone's illness, but the subject of the new town-hall, which it has been decided to erect; certainly, not before it was badly wanted. From the outset, mistakes and mismanagement, bungling and bother, have marked every step of this unfortunate business. The city council, or, rather, a majority therein, determined that the sum to be allotted for the charge of the work was to be £150,000, and afterwards announced that the limit was not to be strictly adhered to by architects taking part in the competition. If this was really intended, it was obvious that the naming of a particular sum, and one which every person at all acquainted with the subject was aware would be quite inadequate to obtain an edifice likely to give satisfaction to the inhabitants, could only tend to mislead; and experience has amply shown the correctness of this anticipation.

After all our perplexities, do we at length see our way out of them? The report of Mr. C. Barry on the designs of the competitors, which was read to this town council on Thursday, 2nd September, cannot be pronounced a satisfactory document, and is marked by a deficiency in clearness which probably corresponds to a state of mental confusion in the writer. It shows one gross inconsistency which is most discreditable to any architect of intelligence. The allotted sum being £150,000, Mr. Barry awards the premiums to three architects whose designs he calculated would cost in execution, respectively, the sums of £220,000, £200,000, and £188,000, the first premium being awarded to the most expensive design, which would cost nearly 50 per cent. above the assigned limit! He accompanies this award with a statement that other designs sent in are of much superior merit, but that he is obliged to exclude them in consequence of their exceeding the authorised limit of £150,000. Reading a little further, we find that the cost of the designs so excluded "appear to range from £180,000 to £250,000." Can absurdity go further? The first premium is awarded to a design that is to cost £220,000, but designs of much superior merit are excluded, because they cost from £180,000 to £250,000! Mr. Barry must have but a poor idea of the inhabitants of the second city of the empire, if he thinks they would consent to be put off with a second or third-rate article for a matter of £30,000. But what idea are these said inhabitants to form of the intelligence of this judicial English architect, who, after two protracted visits to Glasgow, and two months' incubation—for which the council will, of course, be made "to pay through the nose"—can produce nothing better than a report which carries a gross absurdity on its face? The council, on its part, hardly cuts a better figure. The least they could have done would have been to ask him to specify the particular designs which he regarded as absolutely the best, with an estimate, as nearly as could be made, of their probable cost. But instead of this, they at once, upon the motion of Mr. Collins, the provost, agreed to accept the report, and of course to award the premiums as therein recommended. It appears to me that the case has arisen from calling upon the Lord Provost to redeem the pledge which he gave on the last occasion when the council discussed the subject, to defray the premiums out of his own pocket, in the event of the course taken upon his recommendation not being found satisfactory. As he has himself been the principal mover of the council in their proceedings throughout, he cannot complain if he is now called upon to redeem his pledge.

A visit to the designs, which are now exposed to public view in the Corporation galleries, arouses a feeling of melancholy at the amount of industry which has been expended by nearly 100 competitors, to so little purpose, either for themselves or for the interests of architecture. There are few so destitute of merit that they could be pronounced unworthy of the object, and few, on the other hand, which rise above the level of commonplace. Three-fourths of them may be taken as being on a footing of equality. The favourite style, of which the leading characteristic is round-headed windows, bears a close resemblance to that of the Hull Town-hall, of which a very neat engraving appeared in the *Companion to the British Almanack* for 1867. The result will be a building of much the same general character, though larger, if any of the premiated designs are carried out, of which I think there is little probability. It was, of course, quite natural that a Leeds architect should have this example in his mind. The Classical style, which has been generally construed as including the Renaissance, was in a manner forced upon the council by the existing architecture of George-square, the site of the proposed new building, and has been adhered to by the competitors, except in one instance. A gentleman who has no other motto or device than "Town Hall" has sent a design compounded of Venetian Gothic and Flemish elements of very considerable merit. It is at least a proof of liberality in the governing powers that this was not excluded, as it certainly might have been under the conditions prescribed. But as the Renaissance—a wide and various denomination—was held, and very rightly, to come within the terms of competition; it is rather surprising that so little aptitude for handling it should have been displayed by the competitors. There cannot be a doubt that excellent models might have been found in the Continental town-halls of the later Mediæval era, but the designs show no trace of any acquaintance with them. No attempt has been made to assimilate to rich and picturesque varieties of French, Flemish, and German buildings, though some of these were successfully imitated by English and Scotch architects of the Jacobean and Carolvian days. For proof I need not point to Haddon and Longleat, but to the town-halls of two old-fashioned English towns, Abingdon and Lynn.

It must be admitted that the Classical style is a most difficult one to handle in such a way as to attain any novel or striking effect, combined with the character of dignified repose and solid stability essential to its worthy treatment. The last generation was surfeited with Greek temples, adapted for purposes differing as widely as a Christian church and a General Post Office; the present has been equally so with French and Italian Renaissance, not in the grand style of Blois and St. Germain, Florence, and Genoa, but in a poor imitation of the structures of the Second Empire. It is impossible to congratulate many of the competitors on their successful treatment of the style which brought high fortune and lasting fame to Perrault and Mansard. Most of the designs show one or more towers, which in this style are at best excrescences, and they are generally disproportioned to the body of the edifice. I shall not occupy your space and tire your readers by a minute analysis of them, but content myself with specifying those which appear to me most distinguished by a union (apparent at least) of elegance and solidity, with aptness and variety of detail. I note, therefore, those which bear the designations of "Iona," "Spes dulce malum," "Mendelssohn," "Adelensis," "Clyde," and "Apropos," the last especially remarkable for lavish and happy sculptural enrichment, and no doubt likely to be correspondingly expensive if it should eventually be adopted. Some whimsies or vagaries of individuals may be mentioned. "Peace, Progress, and Plenty," is Egyptian rather than Classical in character. One competitor appeals to "Justica," by which he no doubt means "Justitia," as the design further bears the emblem of the sword of justice. Another plaintively remarks, with a superfluous multiplication of letters, "Defficit pecunia, defficit omne." Another declares, in a quotation from Macbeth:—

> "Our will became the servant to defect,
> Which else had freely wrought."

Whether those epigrams were pointed at the restrictions of the Town Council, or intended to shadow forth the conditions under which the designs were completed, must remain a subject for speculation.

What, then, is the result of it all? Present general dissatisfaction; future probable embarrassment. But this, I very well recollect, was what you predicted from the commencement as the probable upshot when it became known that a public competition was to precede the selection of the architect. So far your prophecies have come true, and who is to prove the *Deus ex machinâ* is more than your correspondent can undertake to declare.—I am, &c.,

Vitruvius Caledonius.

In reference to what I have said above, I may state that the Hull Town-hall was designed by Mr. C. Brodrick, and is stated to have cost £28,000. When it is considered that the sum of £150,000 was all that could be afforded by the Gresham Committee for Sir William Tite's London Exchange, the finest of our modern buildings in the Classical style, the Town Council of Glasgow must not be too severely blamed for having fixed upon the same sum. It is curious that Free Trade, which was advocated as certain to cheapen all commodities, seems to have had for its result to double or treble their price.

PROFESSIONAL REFEREES AND SUPPLEMENTARY AND SECRET AWARDS.

Sir,—I have always believed that the graver evils which have hitherto accompanied the system of competitions would be obviated if in every case a professional arbitrator were appointed, but I confess I am losing faith in my opinion. If it becomes a general custom for arbitrators to act as Mr. Charles Barry is reported to have done in connection with the Glasgow competition, I certainly would not compete. The arbitrator is, in my opinion, as much bound by the conditions as the competitors, and to a certain extent Mr. Barry seems to have perceived and acted on this axiom. But why did he send a supplementary letter—the contents of which are not yet actually made public, and which would have remained secret but for the inability of the Glasgow Town Council to keep the cat in the bag?

I am not much concerned in the present instance, though I think Mr. Corson will have just ground for complaint if his design is not carried out. It is all very well to say better designs have been submitted—but they will cost more money. Mr. Corson and the authors of the other premiated designs may, it seems to me, urge with justice that other designs may be better, but that they have faithfully observed the conditions, and at any rate it is only fair that they should have the chance of showing what they can do for the same money that more extravagantly-minded competitors proposed to spend. But what I do object to both now and in the future as a competing architect, is this new element of uncertainty, and possible unfairness, now introduced for the first time, as far as I am aware, in connection with competitions. I think competitors are entitled to know *all* that the professional referee says about them, and that secret and supplementary letters which may influence the ultimate issue much more than the published award, are unfair and unwise. I do not for a moment dispute the opinion Mr. Barry formed as to the superiority of other designs to those to which he has felt himself compelled to award the premiums at Glasgow. His large experience and high position in the profession are sufficient guarantees of *his* ability and integrity, but, in the case of a smaller competition with a professional referee of whose ability and integrity the competing architects were not so fully assured, and with a committee or corporation better able to hold their tongues than the Glasgow councillors, would it be well that a secret and supplementary recommendation beyond and beside that made in the published award, should be allowed to be submitted by the arbitrator? I think not, and I think, moreover, if such a practice became general, competitions would have to be altogether abandoned by all the best architects.—I am, &c.,

Scrutator.

Intercommunication.

QUESTIONS.

[6218.]—**Coal Tar for Felt Roof.**—I shall be glad to know the best method of preparing and using coal tar for rendering a flat-pitched felt-covered roof watertight.—N. H. H.

[6219.]—**Abbeys in Bucks.**—Can any reader of the Building News oblige me with any historical and architectural notes respecting the Abbeys once existing at Notley, Luffield, Medwenham, and Bisham?—L. T. W.

[6220.]—**Statics.**—Would some of the able correspondents kindly give me a few hints as to good works on calculating strains, &c., in constructions, graphic and otherwise.—R. A. F. T.

[6221.]—**Ventilation.**—Having occasion to ventilate a large building, and being desirous to do so by means of vertical tubes connected with the outer air, the tubes being made of oak, and 5ft. 10in. high, placed in the angles of the rooms or where most desirable, and having a canvas net stretched across with open and shut valve, I am anxious to know if by so doing I am infringing any patent?—N. A. L.

REPLIES.

[6204.]—**Cathedrals.**—I find my reply to Mr. Freeman's question, given in your last number, was not quite accurate. Mr. C. R. B. King (so long connected with Sir Gilbert's office, and now with that of Mr. J. O. Scott, in Spring-gardens) has written to say that to Sir Gilbert's design is owing, at Winchester Cathedral, the choir screen; at York Cathedral, a litany desk; at Lincoln, the pulpit. It is to be wished that so good an authority as Mr. King himself, or "Scott's Wyatt," the well-known architect, Mr. John Drayton Wyatt (now perhaps the best and only man alive who could thoroughly do it) would give a complete list of Sir Gilbert Scott's works, whether as "Scott and Moffatt" or when alone in business.—Jas. T. Irvine.

[A good suggestion. We would gladly publish such a list.—Ed. B. N.]

[6212.]—**Racket Courts.**—Probably the best racket court in England (at Prince's Club, Chelsea) is 60ft. by 30ft., and the walls are 40ft. high. The floor is asphalte, and walls of Portland cement. The roof is nearly half glass, of an inch thick, and is fixed in the middle. It is considered a very dry court, and the University and public school matches are played there every year.—R. G. S.

[6214.]—**Indian Ink.**—Winsor and Newton's "Super Super," at 7s. 6d. per stick, stands colour well, and when fresh rubbed may be relied on to keep its good colour, and if properly rubbed does not run when coloured over. Never attempt to work up partly or wholly dried-up ink when colour is to be used. The economy is small, and the mischief often great. When for delicate work rub lightly, and to a good black. This will produce a thin and still black ink, splendid to work. Wash over drawing when well cleaned with soft brush and clean water, to remove any thick places likely to run, and dry with clean blotting-paper. The ink will then be found of good colour, and lines clear and sharp. Colour may then be washed on to any extent safely. A good shadow for uncoloured elevations may be obtained by pale paynet grey. Pale sepia is good for shadows where colour is used, as they show through it almost unchanged in tint.—T. R. C.

PARLIAMENTARY NOTES.

The New Law Courts.—Mr. Broadhurst asked, on Friday last, whether there was any truth in a statement which appeared in the *Globe* on August 20, that a statue of the builder of the New Law Courts was to be placed on a pedestal in that building; and, if so, whether there was any precedent for the erection of a statue in a national building to a contractor; and, if not, whether steps would be taken to prevent such an erection. The hon. member asked to be allowed to insert the word "obscure" before the word "contractor" in his question. The word had been accidentally omitted. Lord F. Cavendish said the information was partly accurate. The principal carver had carved what was intended to be a likeness of the architect on a corbel (laughter); but the architect had not recognised the likeness. (Renewed laughter.) He had no objection to what had been done, and as there was another corbel to be carved, perhaps one of the builders' firm might be similarly immortalised. There was no statue on a pedestal, and the carving of figures as gargoyles was a common practice with Gothic architects. There was, moreover, nothing to individualise the figures—as a roll of papers and a mallet were merely general appendages to a statue.

Compulsory Purchase of Land for Public Purposes.—Mr. Watkin Williams asked last week whether the Government would, in the recess, consider the propriety of amending the law so as to give facilities to the people to obtain land by compulsory purchase for public purposes, such as chapels, markets, and the like, by some speedier and less expensive process than by Act of Parliament. Mr. Dodson: Great facilities are now given for the compulsory purchase of land for sanitary purposes, such as sewage farms, water supply, the clearing of overcrowded areas in large towns, sites for hospitals and mortuaries, street improvements, cemeteries, &c., by means of provisional orders. Lands for markets may also be purchased by the same process, which, except where the confirming

Bill is opposed in Parliament, is, as a rule, a very inexpensive process. Parliament has always reserved to itself the right of vetoing the compulsory purchase of private property, and at present there is no authority to which this power can properly be delegated. At the same time, there are cases to which the provisional order system may advantageously be extended, and I will not fail to consider the matter during the recess.

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WATER SUPPLY AND SANITARY MATTERS.

The Bournemouth Regulations Relating to House Drains.—We have received a copy of the regulations relating to house drains and their connection with the sewers issued by the district of Bournemouth commissioners, in which are some judicious clauses. We see that every work of connection is to be subject to the control of the surveyor to the commissioners (Mr. G. R. Andrews), and that no drain is to be covered up without inspection having been made by the surveyor or other person. With reference to the important question of ventilation, the regulations are useful. Every person who constructs a new drain is to provide at least two untrapped openings to the drains, and in the provision of such openings he is to adopt one or other of two arrangements as circumstances may render the most desirable. These are in accordance with the Local Government Board, the rules of which we have before published (see By-laws). Another provision is that no inlet is to be made in any drain connected with a sewer *within* the house except that from a water-closet. Soil-pipes are to be 4in. diameter, and to be continued up without diminution and without bend (unless unavoidable), to give safe outlets for sewer air. No trap is to be inserted between such drain-pipes and the drains, or any trap (except a water-closet apparatus trap) in any other part of soil-pipe. All waste-pipes and overflow-pipes, except slop-sinks, intended for any solid or liquid filth, are to discharge in the open air, over a channel leading to a trapped gulley-grating, at least, 18in. distant. Detail drawings to a useful scale accompany the regulations. In the plans, the position of the drains, branches, air-outlets, &c., are shown for single and double houses, and sections are given showing the same, and the soil-pipe ventilators. The larger sections illustrate the modes of constructing the inlets and disconnections of drains; the discharge of rain-water-pipes; method of connecting soil-pipe with drain, the soil pipe being external; and the overflow from cistern; the method to be adopted in dealing with waste water from bath-room, and from sink-wastes in basement. The fall for drains is recommended to be 1 in 20, never less than 1 in 40, and proper junction-pipes are insisted on. We find also a prohibition to the use of D traps in any case, and a useful caution is given that no traps intervene between air-inlet and air-outlet for ventilation.

Rathmines and Pembroke, Co. Dublin.—A main drainage scheme for the townships of Rathmines and Pembroke, near Dublin, which has been in progress for two years past, is now approaching completion. Hitherto the districts have been drained by the Swan sewer into the river Dodder, but in 1877 a private Act was procured for the present undertaking. The scheme, as carried out, consists of three distinct sewers, one a high level, which crosses the river Dodder, and the others low-level lines, which all unite near London Bridge. The low-level sewage is there pumped up, and the contents of all three sewers are carried in an embankment along the Strand, the upper surface of which forms a new road, from Irishtown to the Pigeon House Fort, and then beneath the Wall to a point half way between the fort and Poolbeg Lighthouse, where it will be discharged into the Liffey on the receding tide, by a penstock house and valve chamber. The high-level sewer from Clyde-road to London Bridge is circular, 5ft. diameter; from London Bridge to the outfall it is 6ft. diameter; the low-level sewers are egg-shaped, increasing from 3ft. 9in. by 2ft. 6in. to 4ft. by 2ft. 1in.; all are of brick and concrete, and provided with side entrances at short distances and ventilators. Mr. Hassard, C.E., has designed the works, which are being carried out under the supervision of Mr. H. T. Crook, resident engineer; Mr. J. H. Stanford, of Dublin, is the contractor, and the cost will be about £77,000.

Nairn.—A drainage-system has been this season completed at Nairn, the expense of the works having been about £3,000. Instead of running the sewage into the sea, it was resolved to apply the sewage to the irrigation of a piece of waste ground for the growth of grass or other produce. The drainage had to be carried across the river, and for this purpose two piers, consisting of iron cylinders filled in with concrete, were sunk. The pipe—an 18in. iron pipe—was laid upon them, and with footboards and handrails on the top of it, the pipe has been converted into a handsome footbridge, which has proved a great convenience. The level of the pipe being higher than the ground on the other side, a large embankment was raised, in which the pipe was embedded, and the top of the embankment is utilised as a public walk. It is intended to plant the sides of it with shrubs, but in the meantime a covering of grass binds the soil. The place selected for the sewage-farm was known as the Salt Marsh. The first work of the engineer was to devise means to keep back the tide. This he has succeeded in doing by building in the heart of the embankment a dyke of clay, going down to the rock. At present only ten acres are being treated for the utilisation of the sewage. Its distribution is carried on by a series of channels cut in the ground on the ordinary principles of irrigation, and is completely under control, one part being treated one day and another the next, the turning of a tap or two being all that is required to direct the flow to the desired spot. Provision is made to meet any emergency arising from a spate or excessive flow of water in the pipes, so that all danger of the pipes bursting or the water flowing back is obviated, as well as the rest of the land being deluged prevented. Very little, if any, offensive odour is experienced in passing over the ground, and one man is at present sufficient to keep the ground in order. It is yet to be seen whether the utilisation of the sewage will be profitable. Patches of the ground which were irrigated a couple of months ago have a most luxuriant growth of grass.

Wakefield.—A special meeeting of the town council was held on Friday, at which an agreement was formally sealed between the corporation and Mr. Edward Filliter, C.E., of Leeds, for the carrying out of the new waterworks scheme, as sanctioned in the Wakefield Corporation Act, 1880. Owing to the low price of iron pipes, a committee reported that, acting under Mr. Filliter's advice, they had obtained numerous tenders for the supply of the pipes that would be required during the next two years. There was a keen competition for the contract, and they recommended for adoption that of Messrs. Cochrane, Grove, and Co., of Middlesborough, which was considerably below the estimated sum. The tender was accepted, and the council also decided to carry out the smaller of the two alternative schemes of water supply sanctioned by Parliament, that for a supply of two million gallons a day, which is expected to suffice for eight or ten years to come.

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STATUES, MEMORIALS, &c.

The Chamberlain Memorial at Birmingham.—The memorial to mark the municipal services of the Right Hon. Joseph Chamberlain, M.P., which has been for some time in course of erection on the space between the back of the Town Hall and Sir Josiah Mason's College, in Edmund-street, is approaching completion. The memorial, which was designed by Mr. J. H. Chamberlain (Martin and Chamberlain), is a fountain treated architecturally. The upper part of the structure, from which the water will be delivered, is built of stone, and is square in plan, with octagonal projections at the angles. These projections carry four main shafts, which are surmounted by four pointed arches, over each of which is a gable. At each angle of these gables there is placed a pinnacle, and from between the pinnacles an octagonal spire rises to a total height of about 65ft. from the ground. The spire is ornamented with crockets at the angles, and carving on a portion of the surface. The spaces between the main arches before described are filled with ornamented panelling, which is partly decorated with carving and partly filled with mosaics of various designs. In a large circular panel on the south side, under one of the main arches, will be placed the medallion of Mr. Chamberlain, which is being executed in Sicilian marble by Mr. Thomas Woolner, R.A. Round the base of the fountain are grouped three large basins, the lowermost of which is from 50 to 60 feet in diameter, and is surrounded by a series of three steps. The material of which the memorial is erected is white Portland stone. The mosaics have been executed by Messrs. Salviati, Burke, and Co., and the carving is being done by Mr. S. Barfield and his assistants. The stonework and general structure have been erected by Messrs. J. Barnslay and Sons.

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STAINED GLASS.

Old Milverton Church, Leamington.—A memorial window, containing two subjects of Abraham's servants journeying to Mesopotamia, and meeting Rebecca at the well, erected to the memory of a steward, has been erected in the above church, by Mr. Frank Holt, Stained Glass Works, Warwick.

Llanegryn.—A lancet window (subject the Good Shepherd) has been erected in Llanegryn Church, Wales, executed by Mr. F. Holt, Art Works, Warwick.

LEGAL INTELLIGENCE.

The Rights of Mortgagees.—An important point as to the respective rights of first and second mortgagees has been the subject of a reference to arbitration in Edinburgh. A building society held a "first bond and disposition in security" on certain property, and the mortgagor gave a second bond over the property to a solicitor. The second mortgagee, after obtaining a decree against the mortgagor in an "action of maills and duties," collected the rents of the property, whereupon the society, considering it had a prior and preferable right to the property, sued the second mortgagee, who knew of the first bond, for the amount of its claim. The defendant contended that the society's failure to secure the rents by action against the mortgagor left him open to receive them, and that he was under no obligation to pay any debt other than that covered by his own bond; and the referee decided that he was right.

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CHIPS.

The foundation-stone of a railway-station was laid at Clacton-on-Sea with public ceremony on Monday week. The station is to be built in red brick, and will include platforms, each 400ft. in length, refreshment, general, and ladies' waiting-rooms, and a booking-office. The contract has been taken by Messrs. Dumard Brothers, of Clacton, and the work is being executed from the designs of Mr. P. S. Bruff, C.E., of Ipswich, who is also engineer of the line of railway in course of construction to Weeley, on the Tendring Hundred branch of the Great Eastern system, for which Mr. Boys is the contractor. After the ceremony a number of freehold building sites in the new watering-place were sold by public auction at the public-hall.

The Town Council last week appointed Mr. E. N. Burstall, till recently holding a similar position at Derby, as waterworks engineer for the city. The salary is £250 for the first year, £300 for the second, and an annual increase of £25 till £400 be reached, together with a house, gas, and firing.

Another section of the new Tunbridge Wells and Eastbourne extension of the Brighton and South Coast Railway—that from Heathfield to Eridge—was opened on Wednesday week, affording a more direct communication between Tunbridge Wells and Lewes. Mr. Firbank was the contractor.

The Durham rural sanitary authority proceeded to elect on Saturday week a surveyor and inspector of nuisances for the western district of the authority's area, in the place of J. W. Spoor, who recently absconded. Mr. George Gregson, aged 23, clerk and book-keeper, of Cobham, Kent, was elected by a large majority of votes, the candidate standing second being Mr. George Ord, 30, architect and surveyor, of Durham. As usual, there were a large number of candidates.

A new system of water supply is being provided at Dawlish from the plans and under the supervision of Mr. E. Ellis, C.E., of Exeter, engineer to the local board. The reservoirs at the Burrows and the Down at the source are completed, the rising main has been laid, and although the service reservoir is not yet finished, it is proposed to supply the town direct from the main in about a fortnight's time. A scheme of sewerage, with an outlet at high water into the sea at Holcombe, is also in rapid progress, from Mr. Ellis's designs.

A steam saw-mill has just been erected for Messrs. W. Wiffin and Co., timber merchants, in the station-yard at Holsworthy. The sawing machinery is by Messrs. Ransome, of London, and the steam-engine by Messrs. Tuxford, of Boston.

A marble statue of Sir A. B. Walker was unveiled at Liverpool on Friday. The statue is the work of Mr. Warrington Wood, and is placed on the upper landing of the art gallery presented to the town, two years since, by Sir A. B. Walker.

In Friday's *London Gazette*, the name of William John Marsden, architect, of Eccleshall, Yorkshire, appears in the list of bankrupts; Sept. 14, at 11.30, is appointed for surrender at the district court.

A new Wesleyan chapel is on the point of completion at Chester-le-Street, Co. Durham. It seats, including galleries on three sides, 600 persons, and beneath it are schoolroom, classrooms, heating-room, and kitchen. Mr. Wm. Thompson is the architect, Messrs. Thompson are the builders, and the heating-apparatus has been fixed by Messrs. Dinning and Cook, of Newcastle-on-Tyne.

An extension of the East Norfolk Railway from Aylsham to Cawston was inspected on Monday week by Major General Hutchinson, and was opened for traffic two days afterwards. The contractor was Mr. J. Waddell, of Edinburgh, who has been engaged in raising the wreckage of the Tay-bridge. The railway is being further continued from Cawston to Reepham.

Our Office Table.

A correspondent of the *Gardener's Chronicle* records a recent visit to a church which ought to delight the hearts of the Anti-Restorationists. The building is at Fairfield, in Sussex. One service is held on Sundays in the summer, it being in a swamp during the winter. The churchyard was approached by two foot-bridges and an ordinary field-gate; grass grew luxuriantly up to the door without a trace of a path, and there were no graves outside. Inside was a single slab in the floor. There were seven roomy pews besides those for the parson and clerk; the Royal arms and various texts in gold on black boards adorned (?) the white-washed chancel-beam and sloping roof: the Communion-table, under 4 feet square, stood covered with a short red cloth some 3 feet from the wall, surrounded on three sides with a railing and kneeling cushion. The belfry, the haunt of owls, contained three bells, but only one bell-rope, which threatened to pull down all the rotten gearing on the ringer's head; and all the windows, including that at the east end, were square, latticed, and protected by outside shutters The land hereabout belongs to the Dean and Chapter of Canterbury. On the whole, the district does not shine in ecclesiastical matters. The shingled spires or square towers with side turrets render the exterior of the churches pretty, and at Ewhurst Green, for instance, round and pointed Norman arches, ancient piscinas and ornamental oak-work would make the interior so also, but for three glass chandeliers, reminding one of a London music-hall. The congregations are very small, the living valuable, and Dissent flourishing.

Last week a large public clock, which has been fixed in a tower of the new Town Hall at Wakefield by Messrs. Potts and Sons, of Leeds, was started. The clock has been made from the designs and plans of Sir Edmund Beckett, Bart., Q.C., and is constructed on a solid horizontal cast-iron bed frame, which is planed, and room left in the frame for quarter train, should it be thought advisable in the future for the clock to strike the quarters, which could be done at very little expense, as there are bells already in the tower that would do for that purpose. The wheels, which are very strong, are of the best cast metal and gun-metal. The going train has maintaining power attached, on the bolt and shutter principle, by Sir E. Beckett, and all the bushes are of gun-metal, or the best hard brass screwed into the frame, so that each or any wheel can be taken out separately in case of alteration or accident. The double three-legged gravity, also by Sir E. Beckett, has phosphor bronze pallets, and check action. The pendulum is compensated with zinc and iron rods, which will enable the clock to keep uniform time in variations of temperature. The bob, which is cylindrical in form, weighs two cwt. The striking train is very powerful. It has cams attached to the main wheel for lifting the large hammer, which weighs above one cwt., and this strikes upon the hour-bell in the tower, which weighs about two tons and a half. The dials, which are made from the designs of Mr. Thomas E. Collcutt, of London, the architect of the new Town Hall, are about 10ft. in diameter. The frames are made of cast iron, and the figures are of the Arabic pattern. The centres are filled with strong plate-glass of stone colour and the intervening spaces between the figures and minutes are filled with the patent white opal glass. The hands, which are of strong copper, and balanced or counterpoised within, are also made from designs by the architect.

It has already been announced that the Royal Agricultural Society of Ireland have awarded their medal for the building of cottages to the Duke of Devonshire, who, they say, has combined comfort, accommodation, and economy in building to a high degree in the cottages for his labourers on his estate at Garranribeen, County Cork. From the details, which have been published, it appears these houses are built in pairs, with gardens at the front and offices at the back. Each house has a kitchen 12ft. 6in. by 10ft. 9in., 7ft. 8in. high, and a room adjoining it 10ft. by 6ft. 7in., and a space partitioned from this called a store. In the kitchen are two cupboards with shelves and doors. A mantel-piece on oak corbels, pegs for hanging clothes on, these last two items costing simply nothing by being put in at the time of erection. A staircase 2ft. 4in. wide which, being closed in underneath, forms a good store, opening into back kitchen; it leads to the bedrooms upstairs, which are of the same size as the rooms below, and are lighted by windows at the gables. In addition to the house there is a pigstye, a fowl-house, and outhouse covered with corrugated and galvanised iron. Day labour only was used, and paid for in the building of these, and the cost was £90 7s. 6d. each, or, including offices, £100 4s. 6d. complete. The work is of a superior quality, and the Royal Society strongly advises gentlemen about to build cottages to study these plans.

A fine specimen of horological art has been lately added to the Germanic Museum at Nürnberg. It has been erected at the expense of the Princes of the Royal House, and is intended as a memorial of the Wittelsbach Jubilee, celebrated a few days ago. The clock is placed at an elevation of 14·2 mètres, or a little over 46½ft. It is surrounded with ornamental work in Mediæval style and several gilt figures, most of which move by mechanical arrangement. The idea intended to be expressed is that the Bavarian people at all times reverences its king, who governs under the protection of God.

For many months the parish-church of Thirsk, which has been recently restored, has been infested in its interior with some scores of bats, which not only made fearful work of the new oak stalling, but at evening service might be seen flitting to and fro in the vicinity of the rafters of the nave roof. For a length of time they have been a source of great trouble to the church officials and the vicar, and various means have been conceived to rid the edifice of the pests. The church has been stoved with cayenne, but with no beneficial effect, and during the past week an owl has been placed in the church, and during the past few nights the officials have paid regular visits to St. Mary's for the purpose of ascertaining what effect the new inhabitant had on them, but although they have waited each evening well into the darkening, not a bat has been seen, where but a few days ago some scores were visible. If the owl has not destroyed them he has had the effect of compelling them to keep very close quarters. A few months ago the bats did damage to the trombone pipes of the new organ. They entered at the wide end, and, the pipes being narrow at the bottom, found themselves unable to get back. As many as seven and eight dead bats were found in a single pipe.

An exhibition of oil and water-colour paintings, engravings, photographs, statuary, carvings, reliefs, medallions, plate, embroidery, and other articles of general, artistic, and antiquarian interest, has been opened at Whitchurch by the Countess Brownlow, and will be continued to the end of next week. The exhibition of pictures is a good one, and includes the principal works of the most eminent artists of the English, Dutch, Flemish, and Italian schools. The paintings have been principally gathered from the valuable collections of the seats of Salop and neighbouring counties. The exhibition has been greatly augmented by pictures and curiosities from the South Kensington Museum.

A new School of Art is about to be built at Chiswick, on a site commanding a fine frontage in the Bath-road, Bedford-park, near the railway station. The schools will be in connection with the Science and Art Department, South Kensington, and are to be conducted under the direction of Messrs. E. S. Burchett, of the South Kensington schools, and F. Hamilton Jackson, late of the Slade schools. The classes are intended for the use of those who live in the districts known as Acton, Turnham-green, Gunnersbury, and West Hammersmith. The president is the Duke of Devonshire, and the vice-presidents are the Marquis of Bute and Leopold de Rothschild, Esq. The Rev. Lawford W. T. Dale, M.A., vicar of Chiswick, is the chairman of the committee, which is chiefly composed of architects and artists residing in the neighbourhood. The course of instruction comprehends the following subjects:—Freehand in all its branches; practical geometry and perspective; architectural and mechanical drawing; painting in oil, tempera, and water-colours, of ornament, flowers, objects of still-life, &c.; the figure from the antique and the life, and the study of anatomy as applicable to art. The buildings which are about to be commenced will harmonise in style with the new Church, Stores, Club, and other buildings adjoining. Red brick will chiefly be used for the external walls, with rough cast plaster work on the upper floor, and red tiles will cover the roofs. Mr. Maurice B. Adams, A.R.I.B.A., is the architect for the new school.

The Gilchrist Engineering Scholarships at University College, London, are the gift of the Gilchrist Trustees (of whom Mr. R. Leigh Holland is the chairman), and are to be awarded this session for the first time. They are of considerable value. After this year there will be awarded every session a Junior (Entrance) Scholarship of the value of £35 per annum for two years, and a Senior Scholarship of the value of £40 per annum also for two sessions. In this month, however, to start with, *two* (entrance) junior scholarships will be awarded, each of the above value. There is no entrance or other fee. Notice of intention to compete must be sent to the secretary of the College, with certificate of age, on or before the 23rd inst. Applicants must not be over 18 on 1st Oct. next. The secretary will send full particulars as to Regulations, &c., post-free on application. The examination will be held on the 28th of September.

The Sanitary Institute of Great Britain will hold its Autumn Congress for 1880 in Exeter, from Sept. 21st to the 25th. The President of the Congress is his Grace the Duke of Northumberland; the President of the Congress will be Right Hon. Earl Fortescue. An exhibition of Sanitary Apparatus and Appliances will also be held in connection with the Congress. The sections are:—I. Sanitary Science and Preventive Medicine; President, F. S. B. F. De Chaumont, M.D., F.R.S. Section II. Engineering and Sanitary Construction; President, Robert Rawlinson, C.B., M.I.C.E. Section III. Meteorology and Geology; President, Sir Antonio Brady, F.M.S., F.G.S. The following will be the order of proceedings:—Sept. 21st, public luncheon at the Guildhall; in the afternoon the exhibition will be opened by the Mayor of Exeter; in the evening the first general meeting will be held, when the President, Earl Fortescue, will deliver the opening address. Sept. 22nd, second general meeting; Section I., address by the President of the section, followed by papers and discussions on Sanitary Science and Preventive Medicine. In the evening a conversazione will be held at the Palace by the invitation of the Bishop of Exeter. Sept. 23rd, third general meeting; Section II., address by the President; reading of papers and discussions on Engineering and Sanitary Construction. In the evening Dr. B. W. Richardson, LL.D., F.R.S., will deliver a lecture to the Congress. Sept. 24, fourth general meeting; Section III., address by the President, followed by papers and discussions meteorological, geological, and geographical. The closing general meeting of the Congress will be held in the evening, to be followed by a public dinner. Saturday will be given up to excursions.

An old and valued correspondent reminds us of a paragraph which appeared in this journal on page 85, Vol. XIII. (Feb. 3, 1865), and which, he thinks, will be read with interest in connection with the recent gas explosion in Tottenham Court-road, as a corroborating proof of the insufficiency of valves in shutting off a gas supply:—"A Singular Accident has Occurred in Paris.—The gas and water-pipes were laid in a gallery under the pavement of the Pont d'Austerlitz, and the gas company desired to change their service-pipe for a larger one. They consequently shut off the gas by valves upon the mains, respectively, on both sides of the bridge; and they waited until the day time, when the gas was turned off from the public lamps, before commencing the works. Nevertheless, somehow or another, enough gas escaped to fill the chamber that was formed by the gallery with an explosive mixture. It was set on fire by some unknown cause, its explosion killed one and wounded three others, blew up the pavement in the whole length of the bridge, and burst the water-pipe that was laid beside the gas-pipe. It is said that the damage thus occasioned was, at least, equal to the sum of £10,000, all which will fall upon the gas company."

THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 17, 1880.

IRON IN PORTLAND CEMENT.

THE correspondence on this subject, which has taken place in our columns during the last month or more, has elicited from the several correspondents some hitherto unrecognised peculiarities connected with Portland cement. "Magnet," who introduced the discussion, had apparently been struck with the quantity of iron found in a parcel of cement he had examined, and asked very naturally information on the subject, which elicited a reply from a well-known authority on the question. We were favoured with a sample of the iron, which was described in a reply to "Magnet" as ground iron proceeding from some abnormal condition in the grinding or reducing process of the cement manufacture. This explanation, however, did not appear to our correspondent "Magnet" as quite satisfactory, and we have, therefore, with a desire to throw as much light as we can on the important subject of Portland cement, put together a few particulars and examinations bearing on the question.

Portland cement, we need not say, is produced from a definite combination of carbonate of lime, silica, alumina, and oxide of iron, and other subordinate ingredients. When made from white or grey chalk, there is very little oxide of iron from the carbonate of lime source, but the clay or river (Medway) mud contains varying quantities of it. The average analysis from three reliable examinations of this mud exhibits the following constituents:—

Silica	68·09
Alumina	16·81
Oxide of iron	8·93
Lime	2·26
Alkalies, &c...	2·65
Carbonic acid	1·26
	100·00

The constantly changing character of this deposit produces, unfortunately for the careless cement-maker, a good deal of trouble when his manufacture is conducted on the rule of thumb principle.

The following examinations in search of iron have been made, and we shall begin with a statement of the results obtained out of good high-class Portland cements produced from white and grey chalk and Medway mud, under the wet, or original, process of manufacture.

We shall preface our investigations by stating that all the cements examined were sifted through a 2,500 mesh sieve, and the iron was extracted by a magnet from the residuum so obtained. In some of the sifted powder small portions of iron were found, but they were so insignificant in amount that we added them to the general results, and in all cases, therefore, it is to be understood that the matter extracted by the magnet included the total amount which was withdrawn by its magnetic agency. The character of the metallic matter thus obtained consisted generally of the more minute spherical particles of the residuum, and in those cements from which the largest percentages were obtained it was spicular in form. In colour these were various shades, from lightish grey to a dark bluish-black tint.

No. 1 Series.—London Cement.

No. 1 Cement, from white chalk (wet process).
2 ,, ,, ,,
3 ,, grey chalk
4 ,, ,, ,,

No. 1 produced 5 per cent. residuum.
2 ,, 16 ,, ,,
3 ,, 19½ ,, ,,
4 ,, 19⅛ ,, ,,

The matter extracted by the magnet was as follows:—

No. 1, 0·19 per cent. of the cement.
2, 0·205 ,, ,,
3, 0·25 ,, ,,
4, 0·175 ,, ,,

These results bore the following proportions to the different residuums:—

No. 1, 3·80 per cent. of the coarse.
2, 1·27 ,, ,,
3, 1·26 ,, ,,
0, 0·89 ,, ,,

No. 2 Series.—London Cement.

No. 1 cement, from white chalk (semi-wet process).
2 ,, ,, ,,

No. 1 produced 13 per cent. of residuum from a 2,500 sieve.
2 ,, 14 ,, ,,

The matter extracted by the magnet was as follows:—

No. 1, 0·20 per cent. of the cement.
2, 0·25 ,, ,,

These results bore the following proportions to the different residuums:—

No. 1, 1·54 per cent. of the coarse.
2, 1·79 ,, ,,

No. 3 Series.—Cement made in the North of England, with white chalk, and local clays, being converted by the wet process.

No. 1 produced 23½ per cent. of residuum
2 ,, 9 ,, ,,
3 ,, 22 ,, ,,

The matter extracted by the magnet was as follows:—

No. 1, 1·00 per cent. of the cement.
2, 0·205 ,, ,,
3, 0·25 ,, ,,

These results bore the following proportions to the different residuums:—

No. 1, 4·25 per cent. of the coarse
2, 2·22 ,, ,,
3, 1·14 ,, ,,

No. 4 Series—Dry Process.

No. 1, Scotch cement from limestone and shales.
2, Worcestershire cement from limestone and clay.
3, Irish cement from limestones and shales.

No. 1 produced 2·50 per cent. residuum
2 ,, 1·50 ,, ,,
3 ,, 7·50 ,, ,,

The matter extracted by the magnet was as follows:—

No. 1, 0·185 per cent. of the cement
2, 0. 25 ,, ,,
3, 0 225 ,, ,,

These results bore the following proportions to the different residuums:—

No. 1, 0·74 per cent. of the coarse
2, 1 66 ,, ,,
3, 3·00 ,, ,,

No. 5 Series.—(Being "Magnet's" samples marked 1 A, 2 A, 3 A. The sources of materials used in the manufacture not given, nor the process adopted in their conversion—presumably London cements.)

1A produced 15 per cent. of residuum.
2A ,, 28 ,, ,,
3A ,, 9 ,, ,,

The matter extracted by the magnet was as follows:—

1A, 0·25 per cent. of the cement.
2A, 0·75 ,, ,,
3A, 0·215 ,, ,,

These results bore the following proportions to the different residuums:—

1A produced 0·66 per cent. of residuum.
2A ,, 2·68 ,, ,,
3A ,, 0·24 ,, ,,

No. 6 Series.—A Roman cement produced from a bed of argillaceous limestone found in the coal measures near Glasgow.

The residuum obtained was 5 per cent. of coarseness, the matter extracted by the magnet being equal to 2 per cent. of the cement, while it bore a proportion of 40 per cent. to the residuum.

The last experiment (No. 6 series) is a somewhat instructive one, for it shows that the oxides of iron, even under the comparatively low temperature used in producing Roman cement, had been but slightly changed in character. For the better illustration of this point, we give the following analysis of the stone from which the cement was produced:—

Carbonate of lime	64·54
Silica	8·80
Alumina	3·40
Protoxide of iron	10·20
Magnesia	6·76
Phosphates, &c.	2·66
Loss, &c.	3·64
	100·00

This cement weighed about 84lb. per Imperial bushel, set with great rapidity, being of a deep brown colour. Had the same temperature been applied which is required to burn a good Portland cement the mass would have been clinkered, and its setting properties destroyed. The result of this experiment shows that the pseudo-metal liberated by the heat action could not combine in a profitable manner with any of the other ingredients in the kiln. This produce of metallic matter is not approached in any of our other experiments, although cement No. 1 of the 3rd series shows an undue proportion of resulting metallic matter. This cement sets rapidly for a Portland cement, which may be accounted for in the character of the clay used in its production. This clay is of a brownish colour, and of the following analysis:—

Silica	56·39
Alumina	3·52
Oxide of iron	17·14
Oxide of manganese ..	1·74
Lime	4·98
Magnesia	3 94
Potash	1·10
Soda	0·37
Organic matter and water ..	10·82
	100·00

The same cement, however, when highly burnt, sets slowly, and is of the following analysis, viz.:—

Lime	61·27
Magnesia	1·45
Carbonate of lime	1·42
Sulphate of lime	1·98
Alumina	0·94
Oxide of iron	11·39
Oxide of manganese ..	0·68
Silica	18·18
Alkalies	0·64
Carbon	0·78
Water, &c.	1·27
	100·00

Cement No. 2 of the same series is made with a brownish clay, having a considerable portion of oxide of iron in its analysis.

We may gather from these experiments that the average per centage of metallic matter eliminated from the cement by the sieve and magnet, amount in the six samples (Nos. 1 and 2 series) examined, to 0·21 per cent. There is not a very great difference between the results obtained by the wet and semi-wet processes. The average, however, of the cement (series No. 3) from the North of England, made from white chalk and local clays, is greater than that obtained from the London cements, being 0·485 per cent. of metallic matter. This average is much influenced by the exceptionally high proportion of No. 1, which should be considered in discussing this question.

No. 4 series, being the result of the examinations of cements made by the dry process from limestones, shales, and clays containing small proportions of oxide of iron, are, when set, of unusually fine colour, indicating that the metallic matter had exerted no prejudicial influence in that direction.

For the purpose of showing that, even in blue lias lime, a considerable amount of matter capable of extraction by the magnet exists without being submitted during the process of calcination to any very high degree of heat, we have examined several samples, under exactly the same conditions observed in the other experiments, with the following results:—

SERIES No. 7.

No. 1 Blue lias lime from Somersetshire.
,, 2 ,, ,, Warwickshire.

Residuum produced from 2,500-mesh sieve.

No. 1, 35·5 per cent. of coarseness.
,, 2, 16·5 ,, ,, ,,

The matter extracted by the magnet was as follows, viz.—

No. 1, ·50 per cent. of the lime.
,, 2, ·45 ,, ,, ,,

These results bore the following proportions to the residuum:—

No. 1, 1·4 per cent. of residuum.
,, 2, 2·7 ,, ,, ,,

These metallic products could not have been influenced to any very appreciable extent by the temperature of the kiln, the heat of which, even at its maximum intensity, must have been far short of that required to extract iron from its oxides. Neither was there in the course of the manufacturing process any difficult grinding operation, for lime so obtained is easily reduced to the finest powder without the aid of reducing machinery at all. In this primitive, and at best "rule of thumb," process, the *iron matter* must have existed normally, but might have been increased to some small extent, indeed, from the iron pyrites of the fuel used, for both of the coals in Warwickshire and Somersetshire are very impure in character.

These examinations, we trust, will lead to some better understanding of the *metallic iron discovered* by "Magnet," and it will, when receiving more consideration at the hands of makers and consumers of cements, lead up to the rejection of such raw materials containing an immoderate quantity of iron oxides. Our samples have been taken from districts widely apart, and although some of the cements thus examined are fairly good in quality, they are still far short, in our opinion, of what they might, and ought to be. Careless manipulation of raw materials, bad and improper fuel, together with obsolete and unsuitable machinery, produce such cements as are too frequently used in this country; thus hindering constructive progress in many directions.

For the purposes of what we may hope will prove a profitable comparison, we extended our examination to a sample of high-class German cement, with the following results, viz.:—

The residuum obtained from a 2,500-mesh sieve was 6·5 per cent.

The matter extracted by the magnet was ·075 per cent. of the cement, being equal to 1·15 per cent. of the residuum.

For the better understanding of this illustration of good cement-making, we give an analysis of the raw materials from which this cement was produced:—

	Chalk marl.	Clay.
Carbonate of lime	87.29	—
Sulphate of lime	0·37	—
Lime in combination with silica..	1·12	1·45
Magnesia	1·38	0·82
Silica	7·43	49·52
Alumina	0·83	23.85
Oxide of iron	1·48	7.02
Alkalies	trace	2·88
Bisulphide of iron ..	—	3·54
Lime..	—	3·96
Organic matter and moisture	—	5·14

The cement produced from their careful combination is of the following analysis, viz.:—

Silica	22·850
Alumina	5·511
Oxide of iron	2·760
Lime	64·409
Magnesia	1·235
Potash and soda	0·923
Sulphate of lime	2·865

The process adopted in the manufacture of this undoubtedly good cement is the wet one, but with very little resemblance indeed to the clumsy practices of the Thames and Medway manufacturers. The chalk and clay are coaxed by simple and ingenious machinery into the most accurate contact with each other, with what may be termed a superfluous water agency. When the "slurry" is dried, it is moulded with much care into accurate forms, and placed in the kilns where "home-made" coke (produced from English coal) reduced to regular sizes is used to convert them into good wholesome-looking "clinker." No violent means are used in the reduction of this well-burnt clinker, but by intelligent and well-arranged reducing machinery it is brought low enough to enter the millstones, from which it issues into sieves, and passes, without being stored, into the packages in which it is carried to all parts of the world.

The works at which this cement is made were built originally on the lines of the first Portland cement works in England, and although during many years great changes have been made in the details of the different processes carried on, the kilns and coke-ovens are the same as they were twenty years ago. We are told that those who wish to succeed in dealing with physical difficulties, should attentively study Nature, and reverently recognise, with frankness and due humility, her first claims to your loyalty. This duty has been implicitly followed in the production of this German cement; for Nature has been aided, not outraged by any powerful attempt at resistance to her laws. The chalk marl and clay are wooed into the most intimate relationship, which no subsequent process is capable of disturbing, and at the completion of the chemical stage of the manufacture they enter upon the mechanical course, which is equally carefully performed, with such results as we have described. There is no *iron grinding* in the German manufactory, neither do they rub off the faces of the "burr" stones by keeping them in too close contact with each other. The careful elimination of any small particles of raw bricks or coke protects against the dangers of "bolts or nuts" passing on to the grinding mills.

We have said enough, we think, to encourage further thought and experiments in this direction, and we hope to see in the not far distant future the "constructive" binding agent produced without the aid of oxide of iron or alumina. Both these ingredients are disturbing agents in the manufacture of a good and reliable Portland cement, and the sooner they are rejected by the producer the better will it be for the unfortunate and bewildered consumer.

We have made an analysis of the matter extracted by the magnet from the English Portland cements, which may be regarded as a fair average of the whole of the results.

Metallic iron	0·43
Oxide of iron	9·08
Silica	29·69
Alumina	11·66
Lime, water, &c.	49·14
	100·00

In conclusion, we may say that the less iron in Portland cement the better; for its presence, whether chemically or mechanically, is productive of danger.

THE FINE ART EXHIBITION AT BRUSSELS.—II.

NO words could describe the wonders of the superb double cross of the 13th century, No. 117, of which the Church of Walcourt is the happy possessor. It is of wood, covered with plates of silver gilt, exquisitely ornamented with foliage and flowers, and adorned with niello subjects in low-relief; not merely engraved as in 14th and 15th-century work. The upper part of the front seems to symbolise heavenly life—the lower the Saints on earth. There does not appear to be any regular sequence of the subjects. One peculiarity of treatment consists in the division of a subject; for example, in the flagellation, Our Lord is placed in the centre medallion, a flagellator occupying a separate space on either side. Nothing can surpass the beauty of some of the ornamental patterns of this very lovely work. It is equally well finished on either side. No. 118, belonging to the same church, is a reliquary of the true Cross, of the same date and character. In the base are four piping angels in niches, finely modelled. Splendid as is much of the elaborate 14th and 15th-century silverwork, there is nothing really to compare with these first-rate specimens of the 13th, either for taste or skill. No. 239, of the beginning of the 14th century, represents the Virgin Mother with the infant Saviour on her knee. It is ornamented with a single amethyst. The infant holds a bird in his hand. The chair or throne on which she sits is richly ornamented at the back with five arches of two lights each—a most interesting example. Of the work of this century there are a good many specimens, some, of great value, ornamented with translucent enamel. One of the finest is the reliquary of St. Ursula, No. 222. The relics were contained in a cylinder of crystal placed vertically on a pyramidal stand. The enamels represent figures of angels, apostles, and evangelists. We must not omit to mention a fine and engraved "navette à encens" of the 13th century, in champlevé enamel, from the Soltikoff collection, almost as good as that exhibited in the Loan Collection at South Kensington in 1862.

Belgium has cause to be proud of having produced so grand a work as the great polyptych reliquary of the true cross, No. 315. It is in silver-gilt. In the larger central compartment two angels support a cross, richly ornamented and jewelled, to receive the relic. All round the arch are nielli, alternately with rich and delicate open-work panels. The doors are occupied by the Crucifixion, and other religious subjects. The back is covered with masterly engraving and chiselling, with the Crucifixion in the centre; St. Peter and St. Paul on either side, i.e., on the two small wings which would cover the sides when the reliquary was shut; and the angel Gabriel and St. Mary, which would unite and represent the Annunciation on the outside of the front. This work was executed for the Abbey of Floreffe by order of Pierre de la Chapelle in the year 1254. The number of works of the 15th century and later is legion. Some of the many monstrances are most conspicuous. Nos. 120, belonging to the Church of St. Jacques at Louvain, and 121 to that of St. Gertrude, in the same city, are among the best. The former has been regilt, perhaps several times, and so has lost the fine master-touches apparent in its companion. A comparison between these two once almost identical pieces should show the custodians of ancient art-gems the foolishness of meddling with the original work. Some of the censers are of great beauty, and mostly better preserved than might have been expected. The morses too, or brooches to fasten the copes, are both numerous and illustrative of the best art. No. 339, in silver gilt with an ivory centre, surrounded by roses solidly and finely chased, is a capital specimen of the end of the 15th century. No. 549, a monstrance, is a rather uncommon example of Venetian blue and white enamel of the middle of the 16th century. It is not very unlike the earliest Venetian enamelled glass. The finest Limoges enamel of the Renaissance period is No. 211, by Peincaud, in most brilliant colours, with imitation precious stones. It came from the de Norsey collection, and for brilliancy of colour and beauty of design could not easily be matched. No. 581, a portrait of Jacques de Thiennes, is a capital work of Léonard Limousin.

In addition to the ivories already mentioned, we would draw attention to a very ancient horn, called the Horn of St. Hubert (No. 316), the property of the church of Tervueren. The mounting is modern. No. 144 is a good Crozier head, of the 12th century, which belonged to Cardinal Jacques de Vitry, who died in 1244. No. 408 is a coffer, of Oriental work, of the 9th century; No. 409, the centre of a polyptych, of the very finest 14th-century design; No. 411, rather later, is well coloured. In No. 113, an ivory border, covered with figures, surrounds a portative altar of jasper—12th or 13th century. There are also many good specimens of combs, mirror-cases, &c. No. 112 is a set of writing-tablets, in the form of a book, the first and last leaves being sculptured with love-scenes, the centre ones covered with red wax. A statuette of the Virgin and Child, of the 16th century, is of great merit, and has been attributed to Michael Angelo. It was given by Cardinal de Tourdis to the Chartreuse at Bordeaux at the beginning of the 17th century.

There is a splendid exhibition of manuscripts, contributed from the Royal, University, municipal, ecclesiastical, and private libraries. They begin with a fragment of St. Matthew's Gospel of the 5th century, and continue to the 18th. Probably no such complete series of music-books has ever been exhibited before: we see the whole history of musical notation, from the ancient *neumes*—more difficult, one would think, to interpret than the cuneiform writing on Babylonian cylinders—to our present most convenient mode of expressing musical sounds. One book has its music written on the large eleven-line staff; some are splendidly illuminated, *e.g.*, "Cantus Missæ" (115), from the Royal library, the two first pages of which have portraits of Philip le Beau and Jeanne la Folle. Most of the books of the Burgundian library are here. Those who have seen a few in the library itself will be able to judge of the treat of seeing so many of the finest so arranged as to enable comparison to be made *inter se* and with the other precious volumes in these galleries. No. 17, a book of the Gospels, of the 10th century, is a surpassingly-excellent example of Belgian art of that early date. It was written for the abbey of St. Lawrence, at Liege. No. 21, "Lectiones," "Vitæ Sanctorum," &c., 11th or 12th, from the abbey of St. Gerard de Brogne, is a work of great labour. No. 30 is a grand Bible of the 12th century. There is another Bible, of the date 1402, that is simply magnificent, and, next to it, "A Golden Legend" should be noticed. Many of the missals are of rare beauty. Nos. 56 and 183, the latter belonging to Tournay, and of the 14th century, are remarkable. Many volumes apart from their intrinsic charms, have great historical interest, such as the albums of Otho Vœnius, Jacob de Wit, and others, but more especially the highly-illuminated books bearing dates and monograms of the people for whom they were executed. Some of the richest are, as usual, the Horæ B. Virginis. One of this kind, the "Hours of Bruges," has been taken to pieces and framed in a South Kensington stand. It is a great privilege to be allowed to study each page of this lovely little book, but we are afraid that it may be bought at too high a price. It seems scarcely possible that the effect of the light, especially if the greatest precautions are not taken against damp, should not in time greatly damage this delicate and charming work. The hand of Hans Memling is said to be visible in several of the Hours. Next to them come chronicles, translations of classics, and romances. One of the finest is No. 106, "La Forteresse de la Foi," from the library of Charles de Croy, Prince de Chimay. No. 70, "Othéa," by Christine de Pisan, was done for Philip Le Bon in 1455. The Royal library of Copenhagen lends a gorgeous manuscript, No. 80, a book of "The Exploits of Alexander," by Quintus Curtius. No. 74, "The Conquests of Charlemagne," is an extraordinary and most rare production. All the miniatures with which this great folio abound are in grisaille. We have not space to particularise the collection of printed books, which contains an interesting series of books printed in Belgium. The Antwerp part appears to be most complete. There is a good sprinkling of examples of sumptuous printing on vellum, &c. It would also be vain to attempt to give an idea of the vast collection of coins and medals. Those of Greece, of which there are 200, are in matchless condition, and of the highest artistic value; the Roman medals are also very fine. The collection of embroidery, tapestry, and loom work commences from a very early date. The catalogue is very incomplete and unprinted; it is contained in Section C. Two mitres, which were once worn by St. Jacques de Vitry, Bishop of Ptolemais, and are now the property of the sisters of Notre Dame, Namur, are of the 13th century. The borders and ornaments of the one are of vellum, with illuminated miniatures on a gold ground; the other is of needlework, with the martyrdom of St. Thomas of Canterbury on the one side, and St. Lawrence on the other. Conspicuous in this class is a large case full of fine vestments, especially C No. 42, the cope of St. Bavon at Ghent; the ground is cloth of gold. There is one peculiarity: the picture at the back is not separated as usual, but worked in and connected with the orphreys. C 37 is a beautiful antependium, from Liege; C 110 is a very interesting panel in gold, by a Late 15th-century Italian artist. We have in this portion many items of interest—gloves, mittens, hose, purses, and bags of very early times—all worthy of examination. Some are said to have belonged to Mary Queen of Scots and other celebrities. The collection of lace, as might have been expected, is carefully selected and arranged. No pains have been spared to bring together the finest specimens procurable of tapestry. B 65 and following Nos., which line the principal gallery, are a sumptuous series, rivalling the best we have in this country of the same period (16th century). Nos. 76, 77, and 92 may also be named as unusually elaborate and delicate; but the most wonderful of all are Nos. 35, 176, and 178—the triumphs of Pallas, Venus, and Bacchus. They have the mark of Brussels, two capital B's, divided by an escutcheon and a monogram, believed to be that of François Geubels. The drawing and conception remind one forcibly of the beautiful woodcuts in Poliphilus. Like them the designs have been attributed to A. Mantegna, though without much reason. In design, fancy, and execution, they are invaluable.

Class B comprises furniture of all sorts, from the elaborate jack-towel roller to cabinets of nobles and princes. There is little earlier than the beginning of the 17th century, of which date there is a large quantity, especially of cabinets, chairs, and bedsteads (some of the last being built up into the panelling of the rooms).

The whole exhibition does great credit to its originators, and shows in a complete manner the great artistic abilities of Belgium during many centuries.

THE GLASGOW MUNICIPAL BUILDINGS DESIGNS.

[SECOND NOTICE.]

LAST week we reviewed the chief designs for the Municipal Buildings, and we gave a list of some of the others, a few of them being of a high order of merit. It may be of interest to notice a few at greater length than we were able to do last week. Among the more fanciful designs we must place "Town Hall," the author of which has, certainly, in the matter of style, not been bound by the letter of the instructions, which required a building of Classic design, "of a broad and dignified, rather than of a florid character." The main elevation is particularly florid, and the style adopted rather difficult to define, seeing that Gothic features are prominently intermixed with Classic detail. We cannot call it Renaissance, but, rather, a medley of Elizabethan and Gothicesque, both of which elements are present in an eminent degree. The pointed arched windows, and the fantastic gables in cut brick and stone, lead us to the supposition that its author has Southern, rather than Northern, proclivities; and the façades are clearly intended to be built in brick. The drawing is masterly. "Justice and Sword" is a florid columnar composition of one order, Roman in conception, with a centre dome and pediment. The entablature is broken over the columns, and the drawing is sketchy. "Desideratum," in pencil, is rather too heavy in its Renaissance; there seems a want of proportion and gradation; the hall is made an external feature. "Adelensis" is Roman in style, columnar of one order, with an attic above, enriched by statues over the columns. The lofty tower is somewhat overdone, and the angles are pronounced by corner terminals and small cupolas. "Light," in brown ink, is rather frittered, and there is a want of rest and breadth about the main façades; "Valentine" suffers from over-profuseness in detail and sculpture, and a lack of refined detail: but the author has been bold enough to depart from the sketch plan, by placing his town-hall in the centre, so as to obtain a balanced façade. "Old T Square" has sacrificed dignity to elaboration of parts and detail, a fault that has been followed by several. A piling-up of orders, cupolas, and towers scarcely constitutes grandeur, or dignified architecture; and the remark applies to several elaborately-executed designs. "Light," "Concordia et Fidelitas," an incoherent piling up of agony of towers and domes; "Amalgam," which, by the way, is both heavy in mass, as well as tawdry in detail. "Major Domo" is ostentatious, and seeks to vie with St. Peter's dome in splendour and size; "Suum Cuique," on the other hand, is more bizarre than imposing, a fantastic roof and cupola of remarkable outline crowning its main façade; and "B" in circle is perhaps equally given over to gimcrack finery and tawdriness. Passing from this class of architecture we come to several designs in which heaviness has been mistaken for massive and imposing qualities of design. "G" in intersecting circles, and "St. Mungo," with one order of columns, look extremely heavy and crude; and "Reviresco" suffers perhaps rather by its position with other drawings, than from its own want of striking features. "Clutha" and "Red Star" are extremely modest in their pretensions, and, by contrast, they might be assigned to the commonplace; so "1880" in circle, and "Simplex," "Apropos," and "Palladio" are pompous; and "Civis" glories in a florid Renaissance exterior, with a great dome over portico. "St. Kentigern" is the motto of another attempt at Roman magnificence. The façade is dominated by a comprehensive portico and pediment of one order of columns, and the author has not sought to heighten the effect by any extraneous features, such as towers. "Clyde" is a design possessing merit, as shown by a good drawing, but the fronts are rather broken and incoherent; there is a central tower towards the square. The hall is pronounced by a sculptured attic. The alternative design is better. Less ornateness would have been a virtue, as in many other designs where the authors appear to have lost sight of the character of the architecture of George's square, and its solid massive stone character. A richly decorated building would appear rather ridiculous, and would lose rather than gain dignity by association. "Crescent in Square" is a clever drawing, but also conceived in a far too ornate style. It certainly is a medley of Venetian and Moorish detail. "Mottoes only," Italian with a columnar treatment of one order towards the square, has a well grouped pediment and angle cupolas with coupled pilasters to the other fronts, and on the whole the design exhibits a better scale than many we have mentioned here. Arcaded façades, or those in which the columnar treatment has been subordinated, are represented by a few designs; we may mention, for instance, "Fame," in which design circular-headed windows are the main feature with lofty angles and a centre cupola of poor proportion. The detail is meagre. "Iona" is another elaborate conception, in which an arcaded front with centre columns, and a cupola with lantern, has been attempted, but the detail is far too elaborated to successfully compete with the solid structures of the square. "Fiat Lux" is a boldly-drawn composition with angle cupolas, having a columnar treatment of a single order. "Experience" has no roof, but a heavy dome crowns the principal front; the detail is crowded, but confined to the pediments. A curious dome with a huge ball finish is shown. Several other designs are to be seen, but we have mentioned those which are the most striking in conception. As regards the draughtsmanship exhibited, the competition at Glasgow furnishes useful lessons. It shows that perspectives may be discarded without disadvantage. According to the instructions, no perspectives were admitted, the elevations were to be drawn in line, without colour or hatching, although in the last respect the rule has been broken in many instances. We see many elevations where shading has been attempted, and colour or sepia has been used in the windows. Simple outline only is rather too severe a rule, and we think no one can object to seeing the roofs lined in, and the window openings distinguished by flat washes of colour or close-hatched lines. Several of the best designs are drawn in a masterly manner, although they have strictly followed the instructions, and as a test of the architectural skill in Classic design the exhibition holds a prominent place among recent competitions. The only regret is that the architects were fettered in their notions of arrangement, and that the plan issued was considered to be so far perfect as to have left the competitors without choice. The last-issued circular seems to have increased the uncertainty with which some of the competitors regarded the sketch-plan, and this, coupled with the remarks made by some members of the Council, which led the competitors not to strictly adhere to the limit of cost first specified, has tended to make comparison of merit rather more difficult.

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MARGATE.

In the older parts of Margate the usual London type of house is met with; stock and gault bricks, flint, red brick, and stone or stucco are the common building materials; but, as we go farther eastwards, the "west-end," as we may paradoxically call it of the old town, we meet with red brick and stone, half-timbered framed houses, rough cast, and moulded brickwork disposed in a variety of modern fashions. Confining our attention to a few of the more noticeable building improvements in the locality, we remark here, as in Brighton and other seaside places, a large field which the speculative builder has not been slow to occupy. "Cliftonville," as it is called, is a new and increasing suburb of Margate, situated at its extreme east end, and here may be found a few evidences of the spreading taste for Queen Anne and other recent styles. On the main thoroughfare leading to this part, we observe, a large and important Gothic structure in red brick and stone dressings has been erected, and some recent additions are now being made to it. The building in question is the Deaf and Dumb Asylum, a branch establishment of that at the Old Kent-road; it stands in extensive grounds some distance from the road, and presents considerable fronts on four sides. The principal façades are in a kind of Domestic Gothic with mullioned windows having cusped heads and straight stone lintels; the upper windows in the gables are pointed, with arches in brick and stone, and the front towards the road is relieved by a circular turret with conical roof of two stages forming a staircase. Gables break the fronts, and the grouping of the whole at a little distance is pleasing. The red bricks and green slated roofs harmonise well. A small lodge near the road is built in a half-timbered style, in which rough cast has been introduced between the timbers in the dormer gables, and we notice some excellent ridge tiles and terra-cotta hip-knobs and finials. In a similar style is a small building recently erected as a cottage hospital on the same road. It is partly timber-framed and covered with red tiles, and is a pleasing attempt to impart a little variety and feeling into these too-often monotonous abodes of the sick and suffering. In this case the square timbers are painted of a deep chocolate shade, between which the panels are of rough cast. Rows of neat white brick and stuccoed villas are to be met with at Cliftonville; some of these are varied by red-tile roofs, a certainly more agreeable form of covering near the sea than slates. In a row of Gothic villas, we observe a very successful well-grouped instance of a corner building, in which the white brick has been relieved by a bay window constructed of dark framed timbers and tiling. It forms a corner window, and is carried up the whole height of the house, making an internal feature of much convenience and comfort, as it gives an outlook towards the sea; externally also it relieves the monotony of the buff brickwork. The timbers are stained or coloured by a dark tint where they show, but the spaces between the windows are tile-hung, by far the safest method of keeping a dry interior. Cliftonville Hall is a new building in the Queen Anne style. It is of one story, covered by a high red-tile roof, and is built of stock and red brick; the latter used in gables, string-courses, copings, and arches. Two ornamental gables break the roof; these are enriched by red cut and moulded brick, executed in a careful manner; terra-cotta is introduced in panels, and the outline of gables is considerably varied. On the whole, the design is a little too fanciful, and the architect appears to have done his best to squeeze as much showy detail as he could into the front, regardless of repose. Near it we see a site for a proposed reading-room, and several plots of freehold land are to be let, suitable for villas of a good description. The eastern esplanade revels, as usual, in stucco-fronted terraces. We must notice two churches, or buildings for public worship, here. St. Paul's is rather a heavy-looking structure of Kentish rag (in random masonry with dark joints), with nave and aisles and tower, and some heavy flat tracery to the windows, but the detail is *passé*. Close by is a Wesleyan chapel, but of considerably better architecture; the masonry is coursed. By the way, for architectural effect we cannot imagine anything more detrimental than random work with black joints. There is a bold traceried window in the west gable, and the windows have large cusped circles, French in design, but characteristic and effective. There is an unfinished tower and a double gabled transept, and in the east end is a circular window of Geometrical design, with a series of lights underneath. The detail is plain; the jamb and arch-mouldings consist of splays and squares, and the building has a thoroughness about it which its neighbour has not.

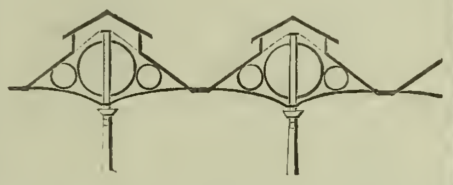
In the town of Margate itself few improvements appear to have been made: the High-street is still miserably narrow, and dangerous in parts from its steepness and strips of pavement, and during some hours of the day very unpleasant smells are experienced, apparently arising from the sewers. Facing the sea, a row of low, dirty-looking tenements, occupied as restaurants and refreshment-bars of various kinds, still detract from the appearance of the esplanade, and we wonder why the local authorities have not long since removed this blemish. Many of the smaller houses are only one room deep, a mode of construction which is singularly injudicious for a seaside town exposed as Margate is to keen winds and bright, hot suns. The rooms are, of course, either intensely hot or extremely cold, and the winds in winter-time whistle right through them. Though a very low rate of mortality is said to prevail, much yet is required to be done before Margate can be said to be a thoroughly sanitary town. Visitors occasionally have to inhale very pestiferous exhalations, even on the sea-beach, where masses of putrefying seaweed accumulate at low tide, and are abominably offensive.

One towering structure of several stories is at present a conspicuous object in the town from almost any direction. The building, scarcely finished, is situated in the High-street, and is intended for a coffee-tavern. Mr. Bowers, of Margate, is the architect. It has white brick facings, with red brick dressings, arches, and string-courses, and the front is ornamented by a lofty dormer gable in red brick. It is a sort of Queen Anne composition. The main features of the façade consist of an open-fronted coffee-room, a moulded brick cornice with arched windows of red brick. In the upper part the spandrels of the windows have a diaper in red terra-cotta, which forms a band, and panels and string-courses of the same material are proposed between the window-heads and sills, and other parts. The roof is tiled, and the flank side above the roof of adjoining houses is relieved by a wide stack with panelled face.

Westgate-on-Sea is a rising locality, and seems to be patronised by the more select class of residents. New terraces are being built facing the sea and near the railway-station, and these erections are partaking of a variety of forms, Queen Anne, Late Gothic, and of the Swiss Chalet. Among the more striking new buildings we notice one or two villas in Queen Anne taste, several picturesquely-treated Gothic villas, in a late half-timbered style, built of red brick, a pale buff brick with red tiled roofs, and many of these are relieved by timbering in the gables and upper parts, between which rough cast panels are introduced. A small row of shops, close to the railway, in a Domestic Gothic style, is a pleasing instance of old English work. The window bays of timbered work project and are carried through the eaves, and hipped back with high red tile roofs. Between the timbers the spaces are stuccoed, and stamped with neat pleasing patterns and diapers of varied design. The dark sage-green timberwork, and the white plaster give a remarkably clean and natty look against the red tiling of the roof and upper stories, and the detail appears to be carried out with thoroughness and good taste. Another feature that strikes one is the covered balcony, and the belvedere, several forms of which appear, and are made features to the house fronts. The Swiss chalets are a little tawdry, with their overhanging fretted barge boards, pendants, and finials of the balconied fronts, but the wide one-span roofs look fresh, and no expense appears to have been spared in their erection. Flint and red brick are good materials, and we see a large villa in Elizabethan has been built with them. The architects of the locality have certainly a large variety of materials to deal with, but red and white brick, timber, and stucco, seem to be the favourites; and at present these have been used with more taste than we should have expected, and an air of piquancy and freshness has been given to this little hamlet by the sea.

GREAT-SPAN ROOFS.

OUR engineers are beginning to learn that the larger the roof the more intractable it becomes. It is more costly to erect, difficult to repair and paint, it occupies greater height, and is generally attended with more risk. The St. Pancras roof, a combined work of engineering and architectural skill, affords us an example of one of the finest, in this country, at least; but although it springs from the platform, it rises to a height, and presents an external appearance that is, perhaps, less satisfactory than flatter curves. A large roof, as we generally understand it, is a single span, springing from the walls and meeting at a point at the ridge. Such a form of roof necessitates considerable height of ridge, and the roofing-in of a large space. Paxton, in his ridge-and-furrow principle of roofing, taught us that a great space might be covered on a different principle: by, in short, a series of small-span roofs, and the Crystal Palace exemplified the system as one of decided economy for large buildings. Recently engineers have learnt the value of an economical principle in construction, namely, that the multiplication of small and simple elements is often more desirable than one large and complex structure; and that in repair and cleaning the former system has unmistakeable advantages. Just now the ridge-and-furrow system, on a large scale, is being adopted at Carlisle, over the new station now erecting by the London and North-Western Railway Company at that city. The roof is a series of small-span roofs, placed transversely to the line, and supported by open trellis-braced girders of light construction. But these girders, instead of being placed wholly below, are introduced immediately under the ridges which they help to sustain, and the rafters and valleys are suspended from them. In a construction of such a kind thrust is eliminated, and the whole roof becomes a succession of straight girders resting upon the walls, and supporting a series of gutters between them. Practically, the advantages offered in such a roof are great, curved principals are saved, height of walling is minimised, there is less weight of iron, and each cross roof becomes a simple one, quite independent of its neighbours, and capable of easy repair and attention. The Carlisle roof covers several lines of rail, and the open girders are placed at a good height above the platform. Looking at the roof from one of the platforms, or, as we should technically say, taking the longitudinal section, the appearance presents a series of roofs, as in the following sketch. It would be of value to compare the cost of erection of this with roofs upon the ordinary plan, and the cost of repair and painting would be an interesting item. At the Glasgow terminus of the Central railway station, a roof of similar construction is to be seen of even greater span; but the trellis-braced girders which rest on the walls of station are entirely below the roofs, which in this case run longitudinally with the station. The effect is obviously less satisfactory viewed from the end, as the large cross-braces, with their upper and lower flange-pieces or booms, arrest the eye at intervals, and there is greater height occupied by the arrangement. At the Carlisle station, the continuity of the roof in its main axis is assisted by the light open circles and cambered ties shown in our diagram, if we can really call them such, which connect the great cross-girders longitudinally, and stiffen them in that direction. These are nothing more than spandrel-bracings to carry the cross-gutters, but they help greatly also in the effect. At the ridges of the roofs are raised lights, or louvres, for ventilation. One of the greatest advantages of the roof is, that there is no thrust on the walls; on the contrary, it tends to tie them together; there is no lost space; the walling may be lighter than with roofs constructed on the arched or bow principle. A span of 80ft. to 90ft. was considered a great engineering feat in roofing when first iron was employed, and the great Liverpool station-roof of 153ft., or, still more, the joint station-roof of New-street, Birmingham, 212ft. in span, spanning ten lines of rail and four platforms and roads, constructed on the bow principle, with cast-iron arched girders with cross-diagonals and struts, appeared to accomplish all that was required. But, though grand triumphs of constructive architecture, they have their defects, which the ridge-and-furrow principle in a large degree removes. The Italian Opera House, Covent Garden, was one of the first buildings in which the principle was applied, the spans in this case being carried by a series of double-trellis girders 9ft. deep and about 20ft. apart, but they were placed below the gutters. In the Carlisle example the space is still further minimised, and the architectural effect rather improved.



THE RUINS OF TEOTIHUACAN.

THESE ruins are at a distance of thirty-one miles north-west of Mexico, on the Vera Cruz Railway. Setting out at 6 a.m., says a contributor to the *North American Review*, I reached the place at 7.30. From the San Juan Station the eye sees hardly anything, save the grand silhouettes of the two pyramids; yet to the south, on the other side of the railway, ruins seem to stretch as far as the foot of the Matlacinga Mountains, which constitute the limit of the valley. To the north are ruins extending to the village of San Martin, distant about two miles. Hence Teotihuacan was a city upwards of nine leagues, or twenty-three miles in circumference. At first view one can form no just idea of the grandeur of these ruins. As with ruins in general, especially when they are overturned and wrecked like those before us, one experiences a grevious disillusion when he looks at them for the first time. It is only after you have made a thorough study of them in mass and in detail that they impress you with their amazing vastness. Nowhere else in America can you, in my opinion, find a more imposing mass of ancient ruins, nor do I know of anything that can compare with this City of the Gods. Starting from the south, near the boundary of this ancient city, I took a northerly direction under the guidance of an Indian, and we passed numerous hillocks, the remains of edifices that have fallen. They are now merely heaps of small porous stones mixed with soil, but their great number is evidence that a large population once inhabited this site. Still continuing northward, we cross the Rio de San Juan, a little muddy stream which, in the rainy season, is a torrent carrying in its current fragments of obsidian, of which I will take away some specimens. Since the abandonment of the ruins, this river has cut a deep gorge which separates about one-third of the ruins on its south side from the remainder on the north. But, while the city flourished, the river must have worn a very different aspect to what it does now. It must have been canalised, and bridges must have connected the two portions of the city. In fact, on ascending the north bank, I found causeways constructed, like the walls of the houses, of a _tetzontli_* concrete and covered with cement. The surface appears to have had a layer of lime, and at other points are seen traces of red paint. Strange to say, in some places we find two and three causeways superposed, the one, two, or three feet above the other, and one asks the reason, the purpose, of these successive causeways, on which promenaders and the citizens in general must have walked in crossing from one side of the river to the other. . . . The farther we go northward, the more do the rubbish-heaps increase in number: we walk through fields bounded by hillocks, and strewed with fragments of pottery of every hue, and with little figures of idols in every shape. These *débris* grow still more abundant as we approach the Pyramid of the Sun. The very soil seems made up of these materials, and we picked up a quantity of specimens, some of them very fine. Soon we reached the Pyramid of the Sun, which rises abruptly from the plain like a volcanic excrescence, having no platform to support it, as have the pyramids in Yucatan. Its base is seven hundred and sixty-one feet square, and its height two hundred and sixteen feet. It exactly faces the four cardinal points. Traces remain of four esplanades one above the other on the summit, and there is no sign of any stairways. Possibly there was originally an inclined plane. The body of the pyramid is constructed of volcanic *débris* laid in vegetable mould; there is no sign of mortar. But the structure was coated with a cement, of which large slabs still remain in perfect condition. This coat of cement was overlaid with white stucco very highly polished, as were all the houses. At the time of the erection of these pyramids, when public monuments and private dwellings were still standing whole, and with their white walls glistening in the sun, in the midst of this splendid plain with its rim of mountains tinted blue and rose colour, the whole must have presented a unique and wonderful spectacle. Surround these monuments, temples, and dwellings with gardens, and then imagine what a prospect greeted the eyes of the astonished Spaniards! Add to this that everywhere one found traces of crossways which extended across the whole city out to the distant suburbs, and you will comprehend the description given of the place by Torquemada. "All these temples and palaces, and all these houses round about," says Torquemada, "were wholly built of white polished lime, so that on beholding them from afar one experienced no end of pleasure at the sight. The alleys, the streets, and the plazas were of coloured and polished cement, and so fair were they, so cleanly and so shining, that it seemed impossible that human hands should have been able to construct them, or that human feet durst tread them. And so true is this, that, all exaggeration aside, my report can be believed, for, in addition to what others have certified to me, I have myself seen certain ruins that gave proof of all I have said; and amid these temples were trees and flowers, magnificent gardens, and parterres breathing fragrance, all for the service and the ornamentation of the temples." To ascend the pyramid is a laborious undertaking, and the descent is full of peril. . . . Leaving the pyramid to the right, we now pursued a northerly course towards the Pyramid of the Moon, along a splendid broad road, over one hundred and thirty feet in width, and bordered with little stone heaps, which represent the ruins of groups of dwellings. This roadway, the surface of which is in some spots still covered with cement, was nearly four miles in length, terminating at the foot of the esplanade in front of the Pyramid of the Moon. Before reaching the terminus the road widened on both sides to the extent of about three hundred and twenty-eight feet, thus forming the two arms of a cross, whereof the route we had followed was the stem, and the Pyramid of the Moon the head; the whole forms a Greek *tau*. At the angle formed by one of the arms with the stem is found a mutilated statue of the goddess that formerly had her temple on the summit of the pyramid. In front of the groups of houses which lined this highway, all of which stood a little off the street on raised ground, are seen, in a perfect state of preservation, the steps of stairways lying parallel to the axis of the street. On these, no doubt, the people and the numerous visitors who came to attend the public or religious ceremonies used to assemble. All this reminds us of the amphitheatres of Chichen-Itza and Uxmal, and we are disposed to give the same interpretation to them all. This highway was, according to tradition, called by the Toltecs "the way of the dead" (*mihotli*). The Toltecs, observe, are reappearing everywhere, and if they did not found Teotihuacan they lived there. But at what period? At a time when Fate was pursuing them, for, according to the tradition cited by Senor Mendoza, they came to this holy place to entreat the gods to avert from them the calamities which had befallen them. But it so happened that, in the midst of the dances and other ceremonies they were performing in honour of these same gods, right on this road and in the amphitheatre, there suddenly appeared a giant among the dancers, and all whom he touched straightway died. On the morrow he came again. His fingers were now long and pointed; again he came in among the files of dancers, and so wounded them with his sharp nails that in two days there was no end of corpses. On the third day, on the top of the lofty mountain Hueitepetl, situate to the west of the pyramids, appeared a babe, white and fair to view, but which gave forth a deadly odour. Filled with terrors by so many misfortunes, and by the mortality which was decimating them, the surviving Toltecs resolved to go back to their capital, Tula or Tollan, and report to their fellow-citizens the outcome of their expedition. Thereupon their priest enjoined them to quit that land for ever. Such at least is the account given by Torquemada; and Veytia, more conversant than he with the hieroglyphs and the traditions of the country, goes to a greater length in detailing the misfortunes which befell the Toltecs prior to their extinction. These myths are not difficult to interpret. According to the first-named historian, the giant represents the heavy inundations which had visited the country, laying it waste. The giant with pointed nails represents the scorching rays of the sun, which destroy everything when they are not associated with the other elements of life. The beautiful white baby represents the frost that destroyed the feeble vegetation which had survived the preceding calamities. As for the *tau*, which is the principal figures in these ruins, and which we see repeated in the great highway, archæologists observe that all the nations of the earth have held that symbol as sacred and as full of deep mysteries. . . . On the left, before you reach the foot of the esplanade fronting the Pyramid of the Moon, is seen an excavation recently made into the side of a tumulus. The entrance is narrow, and the passage difficult, and within there is nothing to be seen but stones. In front of this excavation is seen an enormous statue in the style of all Mexican statues, but it is noteworthy on account of its great size. Originally it stood on the summit of a hill, but it had been cast down, suffering serious injury to its nose in the fall. It represents one, but which one we cannot say, of the divinities worshipped by the builders of the City of the Gods, the famous Teotihuacan. The idol is a trachyte block in the shape of a parallelopipedon, very rudely sculptured, and in all respects resembling a multitude of other gods that date from a later period. However great their talents, their ingenuity as builders, it must be confessed that the founders of this city had no artistic faculty. The block of trachyte is nearly ten and a half feet in height and nearly sixty-four inches square at the base; its estimated weight is thirty-six thousand pounds—a rather ponderous specimen, and interesting withal, but very ugly. Their sculptures, some of them at least, appear to have been executed by the process of rubbing; and surely it were difficult to attain perfection in that way, as we can well understand. But if we examine specimens of their vases or any of those little terra-cotta figures, fashioned as they were out of less refractory material, we shall find them to be true *chefs d'œuvres*, genuine works of art. Thus in our first excavation at Teotihuacan we found some one hundred and twenty-five heads of idols or *lares*, and divers other objects, among them some perfectly-modelled masks. Further, every type is represented in this little collection, which I shall certainly duplicate on my next visit. Among these Indian masks which appear to reproduce all the races of Mexico from infancy to old age, among these terra-cotta specimens representing truly or in caricature all the social gradations, we find two figures of exceptional interest. One of these specimens is a negro's head with thick lips and woolly hair, all perfectly designed; the other the face of a woman, rather disfigured by a broken nose, but plainly of European or Grecian type, and reminding us by its features, of the Venus of Milo. This looks like a pleasantry; but no—my photographs will prove that I simply state facts. It must not be forgotten that we are here in the land of mysteries as regards history and race. How many races have come together here to blend into one? Not even the most learned can give the answer. Outside of the Mexican people—I mean the Aztecs—we know nothing.

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*A porous stone of volcanic origin.

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ANCIENT MASONRY IN LONDON-WALL.

A GOOD many Londoners are unaware that in London-wall an old church, or rather a fragment of one, is to be seen. The building itself still does duty as a City church, and passers-by might have noticed nothing very ancient or striking in the narrow brick entrance decorated with Roman Doric pilasters of 18th century design in London-wall, nor in the east front, with its commonplace Classic pediment and windows facing Aldermanbury. Within the last few days, however, the demolition of a row of shops adjoining the gateway of Sion College has revealed the western wall of the fabric, and has disclosed some very ancient masonry and three arches, evidently belonging to the original structure. These blocked-up recesses are Pointed archways, and were probably the original entrances to the church. The largest is placed some distance back from the road in what appears to be an old tower, for at the south angle we find a mass of rough masonry and brickwork, which evidently formed a buttress of some projection. The smaller arched recess bricked up, that has been brought to light, may have been an entrance or window to the north aisle which now does not exist, as the space is now filled up by a shallow building, facing London Wall on its longest side. The present entrance is merely a lobby or vestibule which opens into the church so long blocked out of sight by the houses which have been built on both sides of it. In examining the arches more closely, we find they are simply splayed outside in the jambs, with arches formed of two splays with a square angle between of Early English character. From the quoins of long and short work and the rough rubble jambs, they have clearly been inside arches, such as we might find to a window or to a doorway with an outer porch. On the south side of the tower is another old archway of segment-pointed shape, the arch springing from the splayed sides of the jambs, and similar in design to the two others. One of the jambs shows a vertical crack on its splayed face, and the masonry on the outside is of rough rubble and flint, loosely held together as the mortar has been washed out. The most interesting portion of the disclosure, viewed from the outside, is the square tower we have mentioned with the two archways in it. At present it is roofed by a pyramidal tile roof rather above the London-Wall entrance structure, to which it seems to belong. Some louvre-boarded openings appear near the top, and the rough masonry of the original tower is clearly seen above the roof of entrance. It is clear that the original building, becoming dilapidated, was rebuilt or patched up, and the present eighteenth-century brick fronts, with painted stucco pilasters and pediments, were built on to it. It is almost certain also that the doorways, from the style of the arch mouldings, belonged to the original edifice, and it is stated on authority that it belonged to St. Mary Elsing, Spittal, founded in 1532. The interior, as it at present exists, is a bare rectangular-shaped apartment lighted by a large side window of three lights, and an end window of Venetian shape, besides two side-windows over the porches. These are filled with stained glass. It is said to have been rebuilt in 1777. On the north wall is a Classic-designed monument to Sir Rowland Hayward, twice Lord Mayor, bearing the date 1593. He is shown kneeling in the centre niche with his wives and children on each side. From historical works we find that the Church of St. Alphage was dedicated to the Saxon Archbishop of Canterbury of that name, who was murdered by the Danes in the eleventh century. The church is now undergoing repair.

On the south side there is a vacant piece of ground now filled with débris, and which will soon be filled up. Its old churchyard is still partly preserved on the opposite side of London-Wall facing Sion College, where a neatly-kept strip of ground, planted with shrubs and flowers and decorated with rockwork, and railed off, may be seen. On a stone let into the wall is an inscription informing the stranger that the ground was formerly part of the churchyard of St. Alphage, and that it was laid out as a garden by the late vicar, the Rev. Mr. Kemp. The wall in which this inscription stone is built is part of the Old Roman city walls.

The gateway of Sion College still remains as a landmark among the new rows of buildings and warehouses. The arched entrance has some good brickwork, the library is an interesting piece of workmanship; but a group of modern buildings call for notice, among them the stone-fronted hall of the Curriers' Company rebuilt some years ago from the designs of Messrs. J. and J. Belcher, in which a Late Flemish Gothic treatment has been adopted, still striking in its details, while close to it we find a good specimen of warehouse architecture, brickwork being treated broadly, and the windows recessed with vertical mullions of warm sandstone, running through the stories. The stepped gables make a picturesque finish. As we are speaking of improvements, we may call the attention of the reader to a few recent buildings showing a decided departure from ordinary design, as applied to warehouses, to be found in the immediate locality of London Wall.

At the corner of Cripplegate-buildings and Fore-street a large block of warehouses with stone fronts, in quite a new dress, has just been built. It is not often that we find Gothic successfully applied to buildings of this class; the style, as English architects treat it, has often a forced and cramped effect when so many stories of windows have to be combined. In these warehouses the architect has selected a kind of German or Flemish Gothic, and has been able to impart a freshness of character to the ranks of openings. Although of four stories in height and with the windows all square headed, the architect has made the most of the fenestration by connecting the windows vertically by the blank panel tracery or decoration so frequently met with in the Late Gothic buildings of Germany. On the ground story there is simply a succession of elliptical shaped arches forming the fronts; these have mouldings running round and intersecting at the springing. This arcading, formed on both frontages has carved spandrels, while between the windows vertically the intersecting German tracery is introduced with piquant effect, and the upper windows have ogee labels finished by huge carved finials of foliage. Between the lines of the windows, narrow square pilasters are carried up, with carved caps, which mark the vertical lines, and these are finished beneath a plain moulded stone cornice with no visible roof. The flat, almost unfinished, effect of the building at the top is compensated for by the playful variety of surface tracery-work and moulding, and the structure is a remarkable contrast to the brick buildings of the same class in this part. As an instance of warehouse architecture, the building has special claim on the attention of the architect who is anxious to infuse a freshness into our commercial city buildings. In the Australian Avenue, a more local rendering of warehouse building is seen, yet still an improvement upon the common stereotyped architecture in this direction. The brickwork of the fronts is reduced to massive piers, having vertical openings for the windows, and these are simply divided by warm-coloured stone lintels, emphasised here and there at the points of intersection with carved emblems and other devices. Directly facing Jewin-crescent on one end is a remarkable attempt to produce something unique in the way of commercial architecture; the whole of the lower part of the building is of reddish sandstone, and the upper story of brick. Wood-street, long noted for its commercial buildings, has received one or two recent additions, one a rather boldly-treated façade of red brick and reddish stone, the window-heads being vigorously carved with large labels and finials in a species of Late Flemish Gothic. The advantage of this type of treatment is that it lends itself more easily to square-headed window openings, admitting decoration of the spaces over the heads. We cannot call this florid or Flamboyant Gothic, however, at all characteristic or expressive of business purposes; yet we think the more sober varieties of German panel or tracery work, if confined to geometrical and strictly surface relief, can be usefully employed in terra-cotta, and stone or cut brick-work in the fronts of City buildings where coloured materials have been found by experience to be little better than money thrown away.

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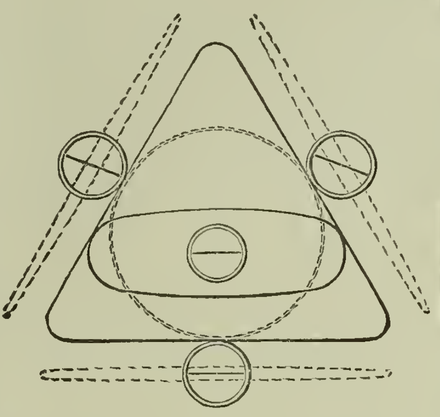
SUGG'S IMPROVEMENTS IN GAS-BURNERS.

IMPROVEMENTS in the arrangement of gas-burners have been recently patented by Mr. W. Sugg, of Vincent-street, Westminster, the object of which, according to the *English Mechanic*, is to construct a compound gas-burner for use in railway yards and other situations where an intense light is required, and where the use of glass chimneys, which are needed for argand burners, is objected to. For this purpose he combines together, say, four or more batwing or other flat-flame burners in such manner that the spaces between them will be equidistant, or nearly so. When constructing a burner with four batwings he arranges three to correspond to the angles of an equilateral triangle, and the fourth is placed in the centre at a somewhat superior elevation. The flames of the outer burners thus arranged will barely reach each other at their adjacent edges. To insure this result and to remove all tendency of the flames to curl inwards and interfere with the perfect combustion of the gas, he arranges within the triangular figure formed by the burners a metal guard of corresponding form having its flat faces presented to the burners, which guard will guide currents of air up to the inner side of the flame. Instead of metal this guard may be made of talc or other suitable material. The flame of the central burner must be kept clear of the flames of the exterior burners, either by diminishing the jet or by elevating it as above indicated, or by both means. Transverse guards parallel to the central flame may also be employed for directing the air upwards to the central burner so as to insure the flatness of the flame. He proposes in some cases to use two or more burners within the circumscribing group, taking care so to arrange them in the way above indicated that the flames of all the burners shall remain distinct or be prevented from blending, as otherwise a forked and irregular mass of flame will be produced. It will be understood that the guard which is inserted within the circumscribing burners will take the figure corresponding to the arrangement of those burners, whatever that may be. A modification of the arrangement above indicated is, in forming a six-light burner, to arrange four in a row of corresponding size, the two outer ones representing two angles of a four sided figure, then for the other angles of this figure to arrange two burners of larger capacity; the air-guards or guides in this case will be arranged parallel to the flames of their respective burners.

In the figure a four-light burner is shown



with three of the jets at the angles of an equilateral triangle, while the fourth is placed at the centre, and preferably at a superior elevation. The guard, when of metal, will take a triangular form and leave a cross piece for the central burner; but if of glass, for cheapness, it will be made circular in form as indicated by the dotted line. The use of compound burners of this kind is believed to give a better result than by using the same quantity of gas in separate burners spaced some distance apart; but it may be questioned whether gas employed in this manner can compete with the electric light.

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THE NEWCASTLE FREE LIBRARY.

ON Monday the foundation-stone was laid of the New Free Library, at Newcastle-on-Tyne. In 1874, at a public meeting, a motion of Dr. Newton for the adoption of the Public Libraries Act, 1855, was carried. A proposal was afterwards made by the committee of the Mechanics' Institute for the amalgamation of that institution with the projected free library, and the result was that the Free Library Committee took over the institute, with all its books, class arrangements, &c. To the east and north of the Mechanics' Institute building an open space of ground was available for the new building that would be required, and the only erection on this ground was the old Carliol Tower, one of the many towers of the old town wall that surrounded Newcastle and withstood more than one siege in the time of border feuds and during the wars between the English and the Scots. After much opposition from antiquaries in all parts of the country it was decided to remove the tower, despite its historical associations, and plans were prepared and approved for the building which is now in progress. It is designed in the Corinthian and Doric orders of Classic architecture. The façade, including the front of the existing Mechanics' Institute building, which the new structure joins, will be 167ft. in length, arranged in bold relief by bays 30ft. wide at each end, with the principal entrance in the centre. This entrance will be approached by seven steps through a portico with Doric columns supporting an entablature, which will be surmounted by a balustrade, and this balustrade will be continued along the whole length of the building. The whole of the centre portion will be surmounted by a pediment, below which will be formed a cornice of the Corinthian order, with blocking-course parapet terminating at the projecting bays. The roof will be semi-circular, and the larger rooms will be lighted by skylights. The building will be three stories in height, and will be set back from the street, and protected by a dwarf wall surmounted by an ornamental railing. The basement floor will be used for ordinary working purposes of the library, and will cover an area of 330 square yards. The lending library will be 60ft. by 42ft., and 17ft. 6in. high. There will also be a reference library 58ft. by 36ft., and 19ft. 10in. high; also two reading-rooms, 43ft. 4in. by 28ft., and 25ft. by 19ft. respectively, each 17ft. 6in. high. On the first floor the front rooms will be devoted to pictures and sculpture, and will be 135ft. long by 28ft. wide, and from 23ft. to 28ft. high, divided by partition walls with sliding doors, the whole arranged *en suite*. Four large rooms will also be set apart for science and art classes, and approached from the front street by a separate entrance. The staircase and part of the walls of the vestibule or hall will be constructed so as to admit of extensions in case of further requirements. The land and structural works, it may be mentioned, are estimated to cost £20,000. The building has been designed by Mr. Alfred M. Fowler, M.Inst.C.E., borough engineer and property surveyor to the Corporation of Newcastle.

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THE MASON SCIENTIFIC COLLEGE AT BIRMINGHAM.

SIR JOSIAH MASON'S Scientific College at Birmingham will be opened on the 1st of October. The foundation-stone was laid five and a half years since. The site comprises about an acre of land, but only about half the ground is at present covered with buildings. These are arranged around two quadrangles, the main block fronting to Edmund-street, and a range of buildings of about the same bulk standing parallel with it at the rear. The two are connected by east and west wings, and by a covered central corridor and out-offices, which divide the inclosed space into two open courts, each of ample extent for the purposes of light and ventilation. The whole of the walls are of brick and stone. The elevation is symmetrical, having the principal entrance in the centre. It is in the 13th century style, with details of a somewhat French character. The ground-floor is raised seven feet above the street level, and a plinth of Bramley Fall stone is carried to this height. The college is entered by a boldly-moulded and deeply-recessed arch, with shafts of grey York stone. The entrance is closed by wrought-iron gates, sliding into grooves in the jambs. Over the gateway projects a stone balcony, above which is a bold oriel window of two stories in height, with geometrical tracery in the heads of the lights. The central gable, against which the upper part of the oriel abuts, is terminated by a mermaid—the crest of the founder of the institution—at a height of 122ft. above the pavement. All the windows—and there are sixty of them in the front of the building, besides the dormers and oriels—have Geometrical tracery within deeply-recessed arches, with effective moulded and shafted jambs, the latter having carved capitals. A stone balcony extends along the whole of the front at the level of the roof, and is stopped at the angles of the several blocks by octagonal turrets carried out from the lines of the front on moulded corbels. On the façade at various points are carved the arms of Birmingham, Warwickshire, Worcester, Worcestershire, and of Sir Josiah Mason. The roofs, which are of a very steep pitch, are red tiled, and are pierced by dormers.

Entering the College by the porch, which has moulded ribs, resting on dwarf columns, with carved capitals, the spaces between the wall ribs being filled with Geometrical tracery and carved spandrels, the visitor finds a handsome central corridor, about 100ft. long by 8½ft. broad, with transverse corridors branching to the right and the left. The latter conduct to the offices connected with the administration of the college, a room allotted to the Natural History Society, and two professors' rooms. The side corridors turn northwards along the wings of the building. In the eastern wing there are two rooms and a class-room for the use of female students, and in the western two class-rooms and an assistant's room for males. These rooms, which are about 15ft. square, have windows looking into the quadrangles, and also receive light from the corridors.

At the extreme end of the central corridor are two apartments, each 48ft. by 30ft. The one on the right is the library and reading-room, and has behind it an ante-room, which can either be used as a place for conversation, or as a separate reading-room for ladies. The room on the left is the physics laboratory. On the first floor the chief and central room is the chemical lecture theatre, 49ft. by 33ft. fitted with seats tier above tier, for the accommodation of 155 students. There is also an ante-room for the lecturer's assistant, a class-room for electricity, and another for magnetism, &c. In the west corridor are rooms for the biological professor and demonstrator, and adjoining them is a room for models employed in the biological department, which occupies the adjoining end of the north block. The corresponding corridor on the east side is that giving access to three rooms to be used for apparatus and other purposes in connection with the physics department. The first floor of the north main block is occupied by two other lecture theatres—one for biology and mathematics, and the other for physics, the latter 47ft. by 30ft., and the former a little smaller, with preparation rooms at the end of each. The biological department is the one nearest the projecting annexe mentioned in the description of the ground-floor, and in this are provided a biology workroom and museum.

The second floor, or top story, is principally devoted to the chemical department, for which the arrangements are of the most extensive and complete kind. A large room, 52ft. by 33ft., in the front of the building, over the chemical lecture theatre, will be used as a general assembly and examination-room.

The ventilation and warming of the College are upon an improved plan. Near the centre of the area rises a very large chimney stack to a height of about 160ft., and it is divided into three flues by thin partitions. The central flue carries the smoke from the boiler, and heats the air in the adjoining flues, which are used for ventilating the lecture theatres. The pipes from the fume niches in the chemical laboratories also communicate with the stack by means of a horizontal flue round the walls. The warming is effected by a coil of pipes, containing 4,475 superficial feet; placed in a vault in the sub-basement. These are warmed by the water from the large boiler, and the air from the courts, passing over the pipes, is conducted by flues to every room in the building. In summer cold air is to be admitted into the rooms by the same means.

The architect of the building is Mr. J. A. Cossins, of Birmingham, who has had the assistance of Mr. Hodgkiss as manager; the stonework has been executed by Mr. Prothero; the carving is by Mr. J. Smith; Messrs. Camm Brothers have supplied the ornamental glass, which is excellent in design and quality. Some of the movable fittings have been supplied by the Midland Joinery Company, the rest, including the fittings of the lecture theatre and laboratories, having been made in the College workshops, under the superintendence of the architect.

THE RAILWAY JUBILEE.

FIFTY years ago last Wednesday the Liverpool and Manchester railroad, which inaugurated a system of travelling hitherto comparatively unknown, was opened admist general rejoicing, although the complete success and brightness of the ceremony was clouded by the unfortunate accident by which Mr. W. Huskisson lost his life. As early as 1824 a company was formed for the purpose of carrying out and completing a railroad connection between Liverpool and Manchester. A prospectus was issued towards the end of that year, in which it was stated that the estimated cost of the undertaking would be £400,000, the proposal being to raise this amount in 4,000 shares of £100 each. The bill was rejected early in the following year, owing largely to the opposition of vested interests. A new prospectus and an altered route between the two great business centres, published in 1825, met with better success, for on the 27th April, 1826, the Bill passed its third reading in the House of Lords. A month afterwards a general meeting of the company was held, at which Mr. Charles Lawrence was appointed chairman, Mr. George Stephenson engineer, and the work was set going without the least delay. The first point of attack was the Wapping Tunnel scheme, and this section of the work was carried on with energy and determination. This section of the scheme really commenced early in 1827, and occupied the whole of that year as well as the greater part of the following, the entire expenditure amounting to £14,768. Meanwhile the construction of the line to Manchester from Liverpool was also being carried on with much activity, and on the 15th September, 1830, the directors were enabled to declare the through line open for passengers and goods traffic. In the original scheme there were 63 bridges—22 of brick, 17 of wood and brick, 11 of brick and stone, 11 of wood, and two of stone and wood. In the formation of the railway no less than three million cubic yards of stone, clay, and soil had to be removed, and the weight of the double line of rails as originally laid was altogether 4,000 tons—both, at that time, wonders of engineering skill. The entire expenditure up to the 31st May, 1830, was £739,165, and the directors in their report in March stated that for the completion of the whole work a further sum of £80,834 would be required, thus making the total about £820,000, more than double the original sum named in the company's prospectus. Here again, however, calculations were at fault, for we now learn from official sources that the entire amount expended on the 30 miles line to Manchester from Liverpool was no less than exactly one million sterling.

The Grand Junction Railway from Newton to Birmingham, 82 miles in length, was opened on the 4th July, 1837; the London and Birmingham Railway, 112 miles long, was opened throughout on the 20th Sept., 1838; the Trent Valley line on the 18th Sept., 1847; and the Runcorn Bridge was opened for goods traffic on the 1st February, 1869, and for passenger traffic on the 1st April, 1869. In 1845 the Liverpool and Manchester and Grand Junction lines were amalgamated; in 1846, the London and Birmingham and Manchester and Birmingham Railways joined the alliance, and these three companies were incorporated afresh under the title of the London and North Western Railway Company, having a capital of £6,250,000 expended, and a length of line opened of 330 miles.

The traffic receipts of the London and North Western Company for the first year after the amalgamation (in 1847) were £2,100,000, and those for the year ending the 30th June last were no less than £9,453,000, the working expenses amounting to £4,872,000. The capital expended up to that date was the enormous sum of £91,000,000, and the length of line then constructed was 1716 miles. The surprising progress of the railway which reached its "golden wedding" epoch on Wednesday, partly as the result of the original scheme's development and partly in consequence of amalgamation, could not be better illustrated than they are by facts and figures; and one is inclined to ask, if such has been the rate of speed and present proud position of this popular company as the result of half a century's work, what will be its position at the close of a century's existence and active labour? The capital authorised and created by the company, according to the half-yearly report, was as follows:—Stock or shares, £75,090,233; loans or debenture stock, £25,397,616; total, £100,487,849. The capital created or sanctioned was—stock or shares, £74,905,403; loans or debenture stock, £25,276,861; total, £100,182,264. The total joint-stock capital received (credited to the 30th June last) was £59,564,729; nominal additions, £9,311,621—total, £68,876,350; while the unissued stock at the same date was £6,029,053. The total capital raised by issue of debenture stock at 4 per cent. on the 30th June was £22,292,463, and on debentures and by debenture stock £22,558,527, showing an increase on the capital existing on the 31st December, 1879, of £509,281 and £162,061 respectively. The receipts for passenger traffic during the first half of this year was £1,694,180; and for merchandise, live stock, and minerals, £2,911,751. The number of passengers carried during that period was 22,486,964; merchandise and minerals, 16,251,071 tons; there were run 8,002,673 mileage of passenger trains, and 8,993,295 mileage of goods and mineral trains. The total expenditure for the half-year was £963,985. As the result in the improvement in the traffic receipts, the directors were enabled to recommend the highest dividend which had been paid at this period of the year since 1873, thus giving a satisfactory climax to half a century's working and progress.

THE TRADES UNION CONGRESS.

THE Thirteenth Annual Trades Union Congress commenced its sittings on Monday in the Antient Concert Rooms, Great Brunswick-street, Dublin. It is the first time the Congress has met in the city. The sitting will continue until Saturday. There were 150 delegates present from various parts of England and Scotland, and 24 from Ireland. Mr. Henry Broadhurst, Secretary, conducted the arrangements. Mr. H. Slatter, Secretary of the Typographical Association of England, and Chairman of the Parliamentary Committee, presided; and there were present Mr. G. Shipton, Vice Chairman of the London Trades Council; Mr. J. Burnett, Treasurer of the Amalgamated Engineers; Mr. J D. Prior, of the Amalgamated Carpenters and Joiners; Mr. G. M. Ball, National Agricultural Labourers' Union; Mr. W. Crawford, Miners' National Union; Mr. J. Inglis, Associated Blacksmiths of Scotland; Mr. P. Knight, Boilermakers and Iron Shipbuilders; and others.

On Tuesday, the Employers' Liability Act was the subject of a long discussion. Mr. J. D. Prior, Manchester, representing the Amalgamated Society of Carpenters and Joiners, moved a resolution which affirmed that "while accepting the Act passed by the Government as an instalment, no Act can be permanently satisfactory unless it places the workmen in the same position as regards compensation for injuries as any member of the general public, and at the same time precludes employers from contracting themselves out of their legal liabilities for compensation by compelling their workmen to join insurance societies." He said that if workmen found employers attempting to carry out this course the Congress would be prepared to take such action in Parliament as would render those contracts illegal. Mr. Daniel Guile, London, representing the ironfounders of the United Kingdom, seconded the motion. Mr. J. Owens, London, said he represented the watermen and lightermen of the river Thames, who numbered 12,000 or 13,000 working men, and had been told on the authority of Mr. Gladstone they were exempt from the provisions of the Act, and were placed in much the same category as seamen. Accordingly the Act could not be accepted by them. Mr. D. Thompson, North Leith (Masons' Association), pointed out the inadequacy of any compensation to meet certain accidents.

The balance-sheet showed the income of the Union during the year was—from Trades Unions, £560 2s. 0½d.; balance from Edinburgh Congress, £96 12s. 2d.; sale of Congress reports, £50 10s.; from City of Glasgow Bank, £10; making a total income of £789 8s. The expenditure amounted to £663 0s. 11d., leaving a balance in hands of the Treasurer of £126 7s.

OUR COMMONPLACE COLUMN.

OBSERVATORY: NOTES ON.

OBSERVATORY construction is one of those special branches of art which have been very meagrely treated on, and the architect intrusted with the building of an observatory must have recourse to the papers of the Royal Astronomical Society, the *English Mechanic*, and other journals, in which descriptions of observatories have appeared. The "Arch. Dict." gives very scant information upon the subject, though it furnishes the student with a pretty complete list of available materials. Of course, the kind of observations to be made will dictate the best plan to be followed, and the dimensions will be regulated by the size of the instruments. It is one of the primary conditions of an observatory that the masonry piers to receive the instruments be of massive construction, and quite independent of the walls of the building; that they should be bedded upon solid foundations carried below any source of disturbance or tremor, such as railways, cuttings, tunnels. They should be constructed of one block of stone, or the beds kept extremely thin, as the slightest settlement is detrimental to accuracy. The observatory at Edinburgh is a cruciform structure, forming a Greek cross, 62ft. long, its arms terminating in hexastyle porticoes. Over the intersection there is a cupola 13ft. diameter with an opening on one side which revolves horizontally; and in the centre rises a circular pier of masonry of a conical shape 19ft. high and 6ft. diameter at its base, intended for an equatorial instrument or for an astronomical circle. In the east arm of the cross, placed in the axis, are two stone piers for the transit instrument, and another for the transit clock, which requires to be fixed with extreme nicety upon a pier of stone free from all vibration. In the west arm is a large pier for the mural circle. The plan and particulars of the Edinburgh observatory are given in Gwilt's "Encyclopædia." The Orwell Park Observatory, described by its architect, Mr. Macvicar Anderson, is published in the sessional papers of the Institute, 1874. The Warsaw Observatory is said to be a fine one (see also Weale's "Pictorial Handbook of London," 1851). A dry situation is necessary, for in the observing rooms no fire-heat is allowed.

OCTAGON.

To draw an octagon in elevation without a plan may be thus performed. Divide the total width into 12 parts; set off $3\frac{1}{2}$ on each side, and produce the lines; the proportions of the sides will be therefore $3\frac{1}{2}$ at the sides and 5 in the centre. To find its area, multiply the diameter by twice one side, and its diameter is to the side as 17 to 7 nearly.

OGEE ARCH.

French *inflexe; arcade en talon.*—A contrasted arch formed by striking two arcs at the springing and two upper arcs above, reversed. One of the earliest examples in England is a tomb in the north aisle of Salisbury Cathedral, about 1246. Canterbury contains, in one of its churches, a window with an arch of this form. It was a Decorated feature, but continued to be used through the Perpendicular period, especially in small ornamental works, niches, and small doorways. In Northamptonshire it is found in the heads of windows. Constructively, this form of arch is not good, as the upper curves cannot be constructed with voussoirs, and, hence, the form has been confined to small arched heads which can be cut out of one or two stones. In the Venetian Gothic style the ogee arch is a common feature.

OGIVALE.

This term is applied to comprehend the style or period in France during which the Pointed arch was used; it is, therefore, equivalent to our Gothic or Pointed architecture. The term "Ogive" is applied to the Pointed arch generally.

OIL.

As a preservative for stone, paint has been used as a coating, but it soon becomes impaired by the atmosphere. Ansted says: "In London, the time it lasts hardly amounts to three years, even under favourable circumstances." Paint is also destructive to the architectural effect of stone buildings, and should never be applied if other processes are available. Oil has been used as a coating with more success, as it fills the pores of the stone, and keeps out the moisture for a time. The objection is that it discolours the stone. Paraffin oil is said to be more durable; but the best preparation is a solution of softsoap in water ($\frac{3}{4}$lb. soap per gallon) followed by a solution of alum ($\frac{1}{2}$lb. per gallon). Dent says, in his "Chemistry of Building Materials," "$1\frac{1}{2}$lb. paraffin to a gallon of coal-tar naphtha, and applied warm, is superior to both the former." Linseed oil oxidises and becomes thick upon exposure to the air, and this property is increased by adding other substances to it. "Raw linseed oil is clear, light in colour, and much used for internal work, for delicate tints; while boiled oil is thicker, darker, and more apt to clog." It is used for outside work, as it dries quicker. Raw linseed oil, when of good quality, should be pale in colour, perfectly transparent, free from smell, and sweet to the taste. Boiled linseed oil (called drying oil) is composed of linseed oil mixed with certain driers, and raised to a high temperature. Boiling the raw oil simply, adds considerably to its drying qualities. For full information on oils see "Notes on Building Construction."

ONYX.

This is a material that has recently been turned to account for ornamental purposes, such as vases, balusters, pedestals, chimney-pieces, &c. Its translucid appearance, beauty, and variety of tint, have brought it into great repute, and the Mexican onyx marble has of late been introduced largely into this country. Every colour may be found in it in all its gradations. Chemically it is a carbonate of lime, combined with sulphate of copper, silver, mercury, and gold; its density surpasses all known marbles. It can be cut in slices as thin as glass, and is nearly as transparent. Blocks of any dimensions can be supplied, and the polish obtainable is equal to that of the finest stones. See Building News, 1867, and more recent volumes.

OOLITES OR ROESTONES.

These are limestones in which the grains resemble small eggs. The granular limestones are liable to decay in acid and smoky atmospheres. The principal building varieties are Chilmark, Portland, Kelton, Ancaster, Painswick, Bath, &c., all of which have been described in the Building News. See "Building Stones," also table of limestone quarries in "Notes on Building Construction." It has been found that the ova-shaped grains in oolites have been formed in a similar manner to the large nodules of the magnesian limestone. The oolitic deposits are very extensive in England, and are generally divided into three, "the upper oolite resting on the Kimmeridge clay; the *middle* representing the Oxford clay, covered by the coral rag; and the *lower* oolite, composed of numerous bands of clay, sands, and limestone. The system embraces the formation called the 'Lias.'" One of the purest oolites is the Ketton, a yellow freestone, easily worked. Of buildings erected of oolites we may mention Byland Abbey, several Lincolnshire churches, Grantham, &c., Abbey Church of Bath. Glastonbury Abbey is a good instance of durability. Wells Cathedral, of an oolite, is decomposed in parts. But, perhaps, the best instance we can name is Salisbury Cathedral, built of Chilmark stone. The stones which looks the most compact are not always so. We refer the reader to Ansted's "Geology" and other works for a thorough investigation into the subject.

OPAQUE GLAZES.

In clay wares opaque glazes are restricted to where it is desired to give an article an appearance of superior make. The article is thus treated:—It is dipped before burning into a slip made of superior clay, finely worked, dried, and brought to the colour required. The use of opaque glazes is frequently met with in the production of ornamental ware, pans of closets, &c.

ORCHESTRA.

Notes on the Construction of Orchestras. — The front of an orchestra in a concert-room should be about 5ft. above the level of floor, rising to the back at a tolerably steep incline. The angles at back of orchestra should be rounded off so that the sound should be reflected. Too great a width is to be avoided. The old Surrey music-hall, considered an excellent room for sound, was as high as it was wide, 68ft., and $2\frac{1}{2}$ times as long, or 170ft. The Free-Trade Hall, Manchester, is also a good room for music; it is $1\frac{1}{2}$ times as wide and $2\frac{1}{2}$ times as long as it is high; or, on an average, 52ft. high, 72ft. wide, and 130ft. long. The music-room at Edinburgh, erected by Professsr Donaldson, is also considered successful. Its dimensions are 36ft. wide, 48ft. high, and 90ft. in length; or in the proportion of 3, 4, and $7\frac{1}{2}$.

In the Surrey Music-hall, a large frame of thin boards, nearly of hemispherical form, was hung over the orchestra slightly tilted upwards, and was found very effective in conducting the sound forward. In the orchestra at the Crystal Palace a similar kind of reflector has been used successfully. Orchestras should be formed of resonant materials, hollow below; thin pine boards is a good material. The seats may be arranged on a curve (isacoustic). (See "Encyc. Britannica," last edition; papers by Wheatstone, 1827—1831; Scott Russell in Papers of R.I.B.A., 1847; and the treatises by Brewer, Pouillet, Weber, Saunders, Wyatt, T. R. Smith, &c.)

LIMOGES CATHEDRAL.

The Cathedral of St. Etiénue at Limoges is a Geometrical Gothic edifice, dating from the 13th century, of considerable merit, but of which unfortunately only the two eastern bays of nave were completed with the rest of the structure. The building consists of this incomplete nave with aisles, and chapels between the buttresses, transepts, and choir, all of lofty proportions. The main arcade, triforium, and clerestory are of the same design throughout, except for the modifications of span necessary for the vaulting of the polygonal apse. The apse, with aisles and polygonal chapels, is of very pleasing design, and the eastern end externally is bold and effective. The façade of north transept is a reconstruction of the Flamboyant period. It is more than usually agreeable, because the elaborate detail is well subordinated to strongly-marked leading forms.

The works at present in progress are upon the three western bays of the nave, and the narthex between it and the tower, which is at the west end of the church.

The work is being executed in a hard fine granite. The richly clustered shafts, with carved capitals and moulded bases—the deeply moulded vaulting ribs—the tracery of windows and sunk tracery upon sides of chapels, are all worked in this stubborn material, of the same designs, of course, as the ancient parts. And these were not anywhere restricted because of the difficulty of their execution. Even the rich detail of the elaborate Flamboyant façade of transept is all patiently carved in the same material.

In the new work some of the smaller carved capitals in narthex are being executed in a limestone which is somewhat more tractable.

The masonry of the nave walls is up to lower part of clerestory, and the deep buttresses which rise through the roof of chapels are nearly ready for their horizontal coping. The vaulting (which is entirely of granite) is completed over the chapels of two of the bays, and they are roofed in. Over the aisles the vaults are in different stages of advancement. The narthex is ready for vaulting, but is not yet commenced. This feature is large and lofty, the vaults being about level with those of aisles. It is a good expedient for avoiding the junction of nave and tower, which, as there are windows in the latter below the level of nave roof, would be awkward. The tower is of the peculiar type common to the three large churches of this town, but rare elsewhere; namely, a square basement of two or three stories; breaking back into an octagon, placed with angles over the centres of faces of the basement; and with, upon the angles of square, octagonal pinnacles with faces parallel with those of square. These octagonal forms are continued through three similar stories, with lancet windows of simple design, and are crowned with plain spires. The cathedral tower has, at present, only a low timber-tiled roof.

The completed portion of nave is inclosed by a solid temporary wall, against which is an Early Renaissance organ-loft, with spiral stairs in open turrets at the angles. This work, some parts of which are very fine, is probably too dilapidated for re-erection, even if it be advisable. But it is to be hoped that it will nevertheless be preserved elsewhere.

The works are progressing but slowly. They have been long in hand, something more than five years, and some foundations and lower walls then existed. But, as is so often the case, funds are not forthcoming sufficiently to employ so large a number of workmen as there is room for.

The direction of the work is in the hands of M. Boullenger, the diocesan architect of Limoges.

R. W. Gibson.

CHIPS.

The memorial-stone of a Sunday-school, in connection with the Primitive Methodist Chapel, St. George's, Bristol, was laid on Monday. The chapel is of Pennant stone with freestone dressings, and was erected by Mr. T. Pbipps, builder, of St. George's, from designs supplied by Mr. Ranger, of London. At present accommodation is provided for 425, but arrangements have been made by which a gallery can be erected which will increase the number of seats to 700. The estimated cost for the chapel and the schools at present in course of erection is about £1,800.

The parish-church of St. Bartholomew, Churchdown, Gloucester, which has been restored under the direction of Mr. Ewan Christian, was reopened on the 5th inst. The building stands apart on a hill, and is said to occupy the site first of a temple dedicated to Tor, and afterwards of a Roman basilica. At all events, it is believed to contain traces of pre-Norman work, and of work in every succeeding style down to the Renaissance. The oak pulpit of the time of Charles I. has been retained.

A stained-glass window has just been placed in the chancel of St. Mary Magdalene's Church, Croydon, in memory of the late Theodore Lloyd, J.P. The subject is the Resurrection, and the work has been carried out by Messrs. Britten and Gilson, of Union-street, Southwark.

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ILLUSTRATIONS.

FIRST PREMIATED DESIGN FOR THE NEW MUNICIPAL BUILDINGS, GLASGOW.—PROPOSED BUILDING FOR THE TRADES HOUSE, GLASGOW.—SKETCHES FROM CAEN AND LISIEUX. —"SANDROCK," HASTINGS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

FIRST PREMIATED DESIGN FOR THE PROPOSED MUNICIPAL OFFICES, GLASGOW.

For description see p. 339.

TRADES HOUSE, GLASGOW.

This design, by Messrs. Salmon and Son, of Glasgow, which was shown in the recent Royal Academy Exhibition, was prepared for a new building intended to be erected by the Incorporated Trades of Glasgow. The style is Renaissance, and shows by its masterly treatment the great resources of that style. The balance of parts and outline is arranged with great care, presenting an architectural combination of much grace and beauty. The sculpture on the façade is emblematic and historical, illustrating the many memorable events connected with the Trades House and the city.

SKETCHES FROM CAEN AND LISIEUX.

The sheet of sketches published this week is a reproduction of a few, selected from a large number, made during a tour in Normandy in 1877. The tower shown is attached to St. Gilles, one of the many desecrated churches to be found in Caen. It is situated near the quay, and opposite to the Abbaye aux Dames. The spire is somewhat remarkable for the entasis, which is great for so short a spire. The archway shown immediately below the tower forms a porch over the south doorway. The small sketch plan appended is sufficiently explanatory of the general arrangement. The sketch in the right-hand top corner represents the termination of one of the six towers formerly existing in the old town wall of Lisieux. Two or three still remain, but none in so good a state of preservation as the one shown. Whilst differing slightly in detail, they agree fairly in general composition. Careful inspection made it apparent that, at some previous time, the ground-line must have been at least 15ft. below the present one. The dormer shown from the Rue-au-Fevre is well known to all visitors to Lisieux. It is but a small portion of a very elaborately-fronted house, located in an extremely narrow thoroughfare. A measured drawing, by E. W. Godwin, was published in the Building News a few years ago. The sketch of the house in the Rue d'Ouville, Lisieux, is thoroughly characteristic of the half-timbered work in this part of Normandy, and is well worthy of the most careful study. The most important parts of the timberwork are richly embellished with carving, both on the plain and moulded surfaces. In conclusion, it should be observed that any slight error of perspective must be attributed to the fact that the original sketches were made entirely in ink, on the spot.—A. H. T.

"SANDROCK," HASTINGS.

Sandrock, of which we publish a view this week, is a house situated on the south slope of the St. Helen's Valley, overlooking the towns of Hastings and St. Leonards. It was built about twelve years ago; but not being large enough for the requirements of the present owner, it is now being considerably increased by the addition on the ground-floor of new kitchens and a drawing-room, 32ft. by 21ft., the present dining and drawing-rooms being thrown together, making one room, 30ft. by 18ft. The general arrangement of the plan is made more convenient by these and other minor alterations. Several new bedrooms have been added on the first and second floors, and a billiard-room built, about the same size as the drawing-room, lighted by the lantern shown in the drawing. It is kept entirely apart from the rest of the rooms on the floor, having a separate staircase; from the nature of the site, it was undesirable to place this room on the ground-floor. The view we publish is taken from the drawing exhibited in this year's Royal Academy; all the work shown is new, with the exception of a small portion in the centre. The works are being carried out under the superintendence of the architect, Mr. Murray, of Hastings, by Messrs. Howell and Son, builders, of the same place.

A NEW CATHOLIC CHURCH IN NEW YORK.

(BY A CORRESPONDENT.)

A LARGE church, to be dedicated to St. Francis Xavier, has been in the course of erection for four years on the south side of 16th Street, near 6th Avenue, New York. It is to be ready for use on the 1st of May, 1882. It will be one of the most expensive and elaborate Roman Catholic churches in the city. New Hampshire grey granite and red porphyry are the sole materials used in the front of the building, the style of which combines the Early Roman and the Corinthian. Its height is 104ft., and its width 77ft. The framework of the façade is of bluish-grey granite, and the ornamental parts are of mottled granite and porphyry. The interior of the church is approached from the street level by a massive porch, flanked by strong pilasters panelled with mottled granite, which inclose under a slender cornice three arches on two polished columns. On either side are similar pilasters supporting the wings. Above the triple archway are triglyphs and a heavy stone balustrade, and from the level of the balustrade piers of rough-hewn granite run up to support the roof. A grand arch connects the piers which ascend from the ends of the balustrade, and inside is a second arch, beneath which will stand a marble statue of the patron saint of the church. These chief piers are carried up to the cornice of the crowning tympanum, and will end in statues of saints. The wing piers will also be crowned with statues. In the crowning tympanum is a handsome bas-relief, over which is a gilt cross. The effect of the façade is excellent, the outline is pleasing, the ornamentation sufficient, and the whole expresses grace as well as solidity.

All the statues for the exterior and interior will be made by M. Froc-Robert, of Paris, and the statues for the exterior will be placed on their pedestals during September, as they are on their way to New York now. The prevailing tint of the interior will be a faint green, and a rich profusion of gilt and bright colours will be used in the decoration. All the plaster-work will be painted. The interior of the church is in the form of a cross, consisting of a nave 77ft. wide, with a dome roof 73ft. above the floor of the church, extending back to a transept the same width as nave (184ft.), and having an equally high roof. The choir, which is directly opposite the nave, is 73ft. wide, and 30ft. deep, and the roof is a dome which intersects the transept roof. Five aisles, including the side aisles, will divide the body of seats, and in each transept wing will be a single block of pews. A large vestibule, with holy-water fountains, will separate the interior from the stone porch without. In the sanctuary there will be three marble altars, which, like all the altars in the building, will be made in Rome. There will also be two confessionals at each end of the transept, and two more near the main entrance to the nave. In the sanctuary above the altars will be a row of large statues placed upon highly-ornamented pedestals. A massive gallery skirts the nave walls, and above, on either side, will be statues of the Apostles.

The painting of the interior will be entirely in oils, and many large pictures will be on the walls. The decoration of the ceiling will be very beautiful. Over the centre of the transepts is to be a circular painting 20ft. in diameter, representing the apotheosis of St. Francis Xavier, and from this central figure-piece will run a line of panel paintings, each measuring 8ft. by 10ft. along the entire length of the nave ceiling. They will represent angels carrying scrolls, on which will be inscribed the litanies of the patron saint. The organ-loft will be a handsome structure just over the main entrance, and in it will be put as fine an organ as is in the city. Besides the organ in the loft—where the regular church choir will sit—there will be an organ in the sanctuary, where a boy-choir will assist in chanting the Masses.

ARCHÆOLOGICAL.

Druidical Researches in the South of France.—A correspondent from Arudy (Basses-Pyrénées) informs *Galignani* that some interesting antiquities have been discovered in that neighbourhood. Owing to the railway extension from Pau to Oléron and Laruns, the dolmen of Le Buzy or Téberne, near Arudy, is being removed. "The general appearance of the relics," he continues, "is well known. They have usually been found covered up with earth, in order, do doubt, to protect them from the action of the elements, and perhaps, too, from human hands. They are sepulchral chambers formed by oblong stones supporting another and larger one in a horizontal position, each structure inclosing the dust of several persons, probably members of the same family. The dolmen at Téberne is regularly constructed, forming a parallelopipedon by means of eight upright stones, six of which are on each side and two at the extreme ends. The length of the monument is 6m. 60c., and its width between the lateral supports 1m. 30c. The height of the supports is 2m. 70c., and the length of the upper table, which is elliptical in form, is rather more than three metres. Traces of pottery, in the form of fragments of an urn, have been found on one of the inner sides of the dolmen, furnishing additional proof, were any needed, that the ceramic art was not unknown to the people of prehistoric times. Stone rollers, evidently used in grinding corn, have also been brought to light, and, lower down, the explorers have found several pieces of cut flints. These include a stiletto, ten knives, three scrapers, three arrowheads, and four rough and unfinished pieces of stone. Among these articles was also a fragment of cut granite, with a groove in the centre, probably used to sharpen instruments.

The Archæological Society of Rome.—The antiquarian world will learn with regret that the Archæological Society of Rome, which has done so much good service in the exploration of the ancient walls and fortifications of the city, and of its ancient churches, such as that of San Clemente, is practically, if not formally, extinct. It has lived a lingering existence for the last year or two—in fact, ever since the return of Mr. J. H. Parker from Rome to Oxford—and even in its most successful days it had much to contend with. The other societies were jealous of it, and there were divided counsels among its members. Within the last few years, too, the colony of English residents in Rome has been seriously diminishing in point of numbers, and the railways have made a complete revolution in society, so that the association would have to depend henceforth on the subscriptions of casual visitors. Under the circumstances it has been resolved to discontinue its subscriptions and to allow it quietly to pass away into the domain of history.

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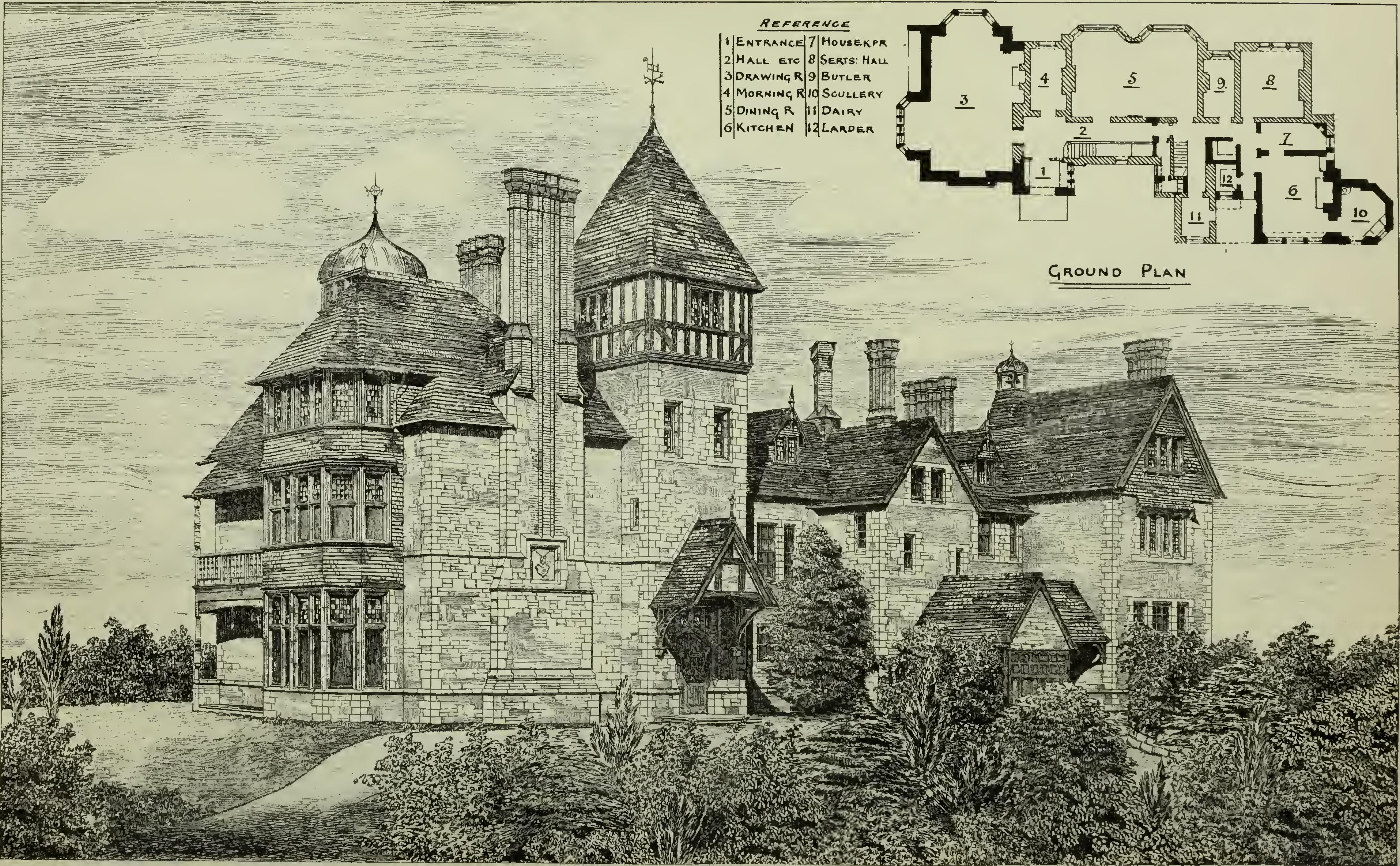
The name of J. K. Morley, architect, of Stapenhill, appears in Friday's *London Gazette* in the list of liquidations by arrangement.

New schools are in course of erection for the Carlisle School Board, in Denton Holme, and will be opened in a month's time. Mr. Daniel Birkett, of Carlisle, is the architect.



REFERENCE

1	ENTRANCE	7	HOUSEKPR
2	HALL ETC	8	SERTS: HALL
3	DRAWING R	9	BUTLER
4	MORNING R	10	SCULLERY
5	DINING R	11	DAIRY
6	KITCHEN	12	LARDER

THE RESIDENCE OF THE BARONESS VON ROEMER

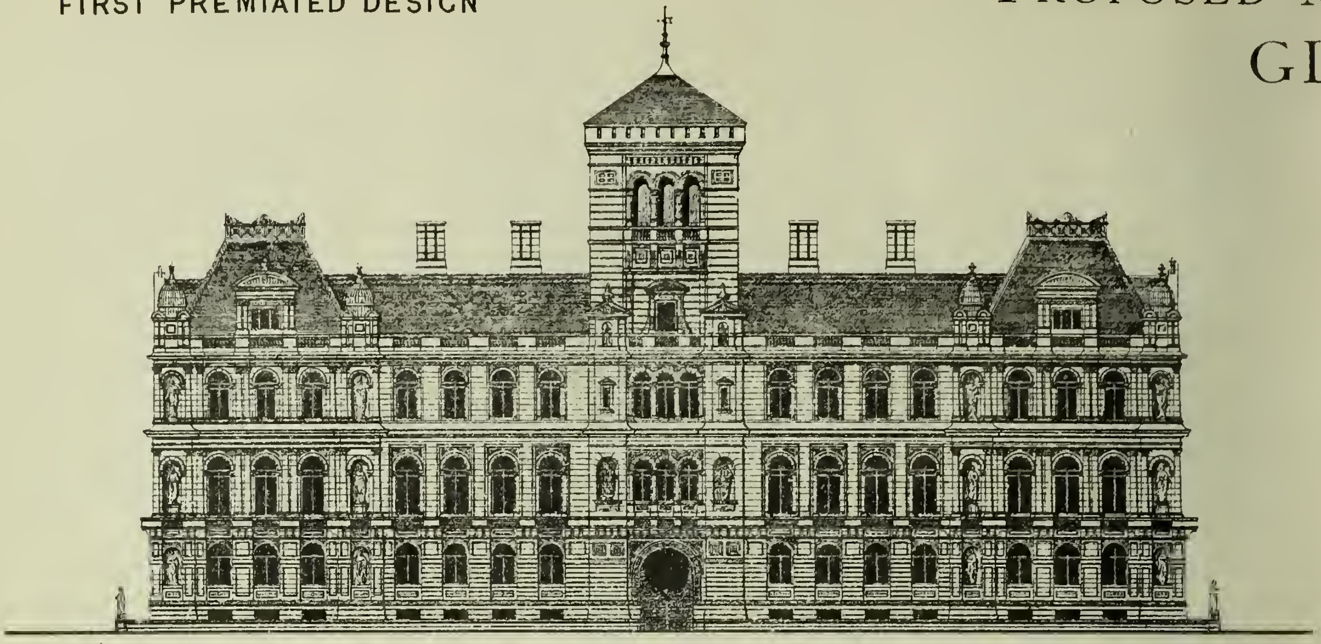
"SANDROCK" HASTINGS

W. HAY MURRAY, ARCHITECT

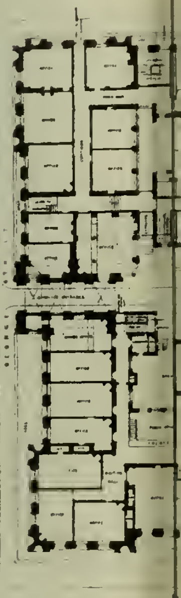
Proposed Mun
GLAS

GEO.

FIRST PREMIATED DESIGN

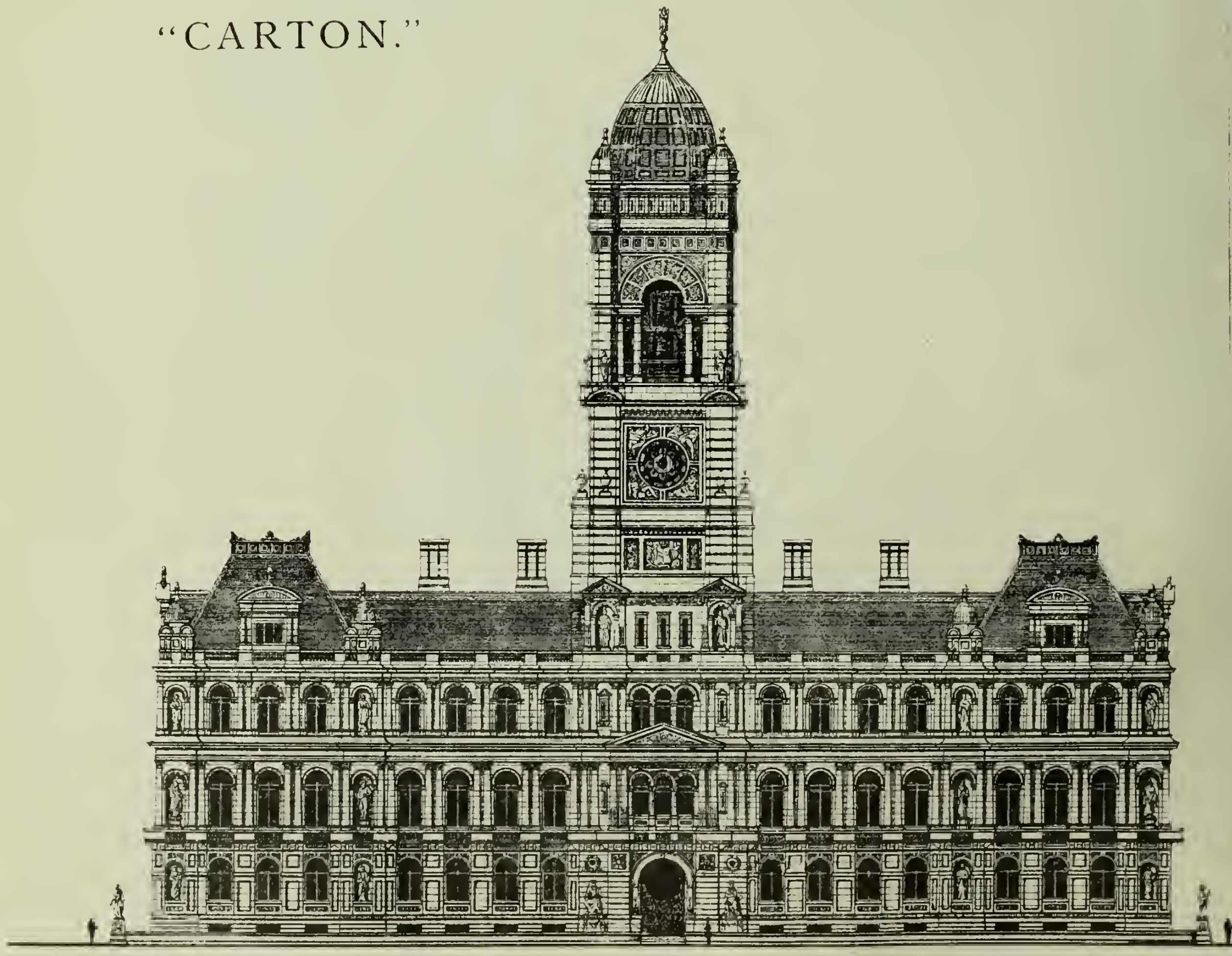


ELEVATION TO COCHRANE STREET



Submitted under the Motto:

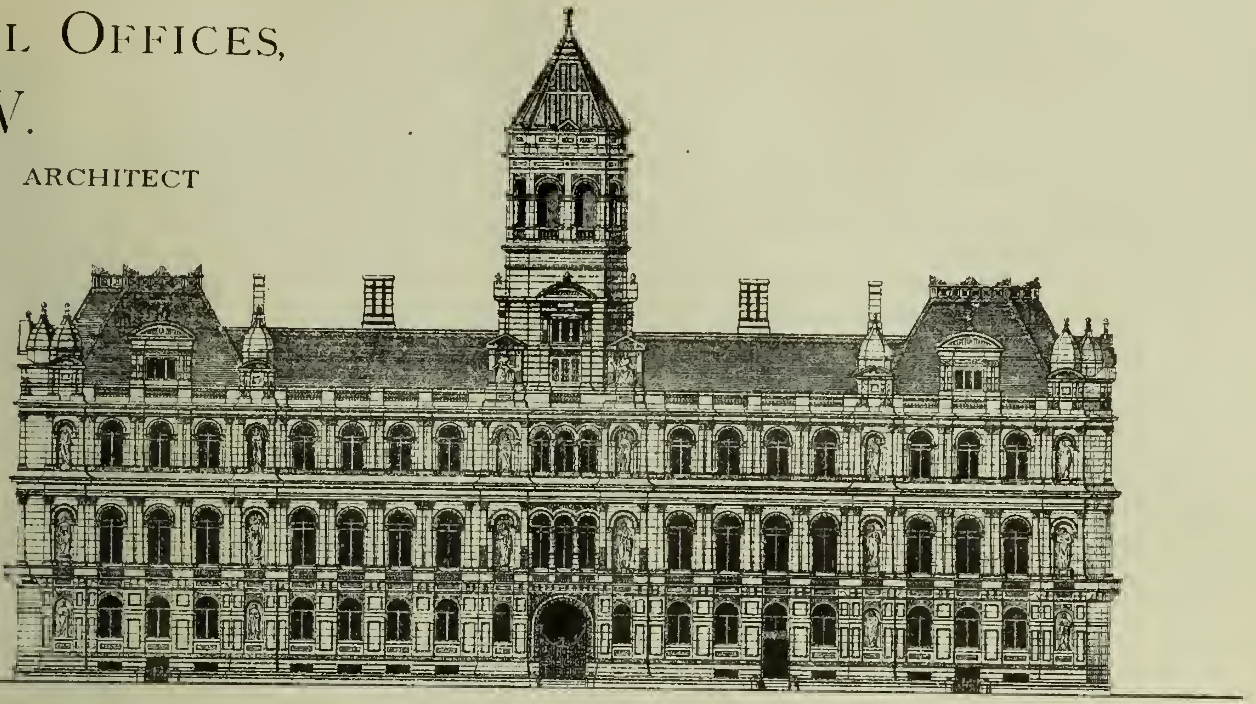
"CARTON."



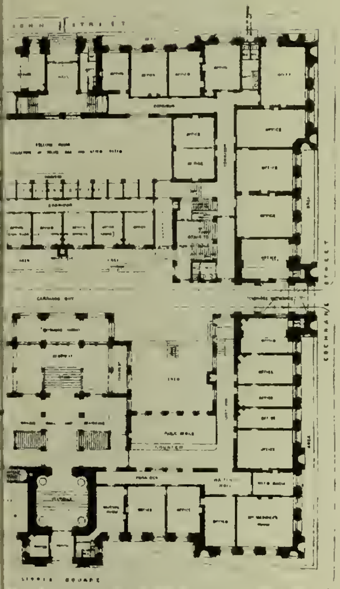
ELEVATION TO GEORGE SQUARE.

CIPAL OFFICES, GOW.

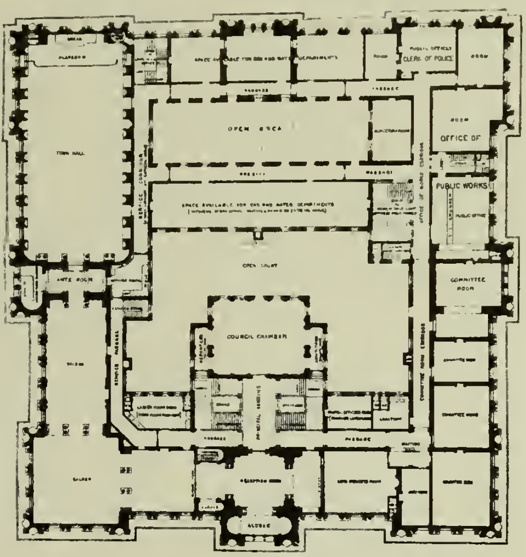
RSON ARCHITECT



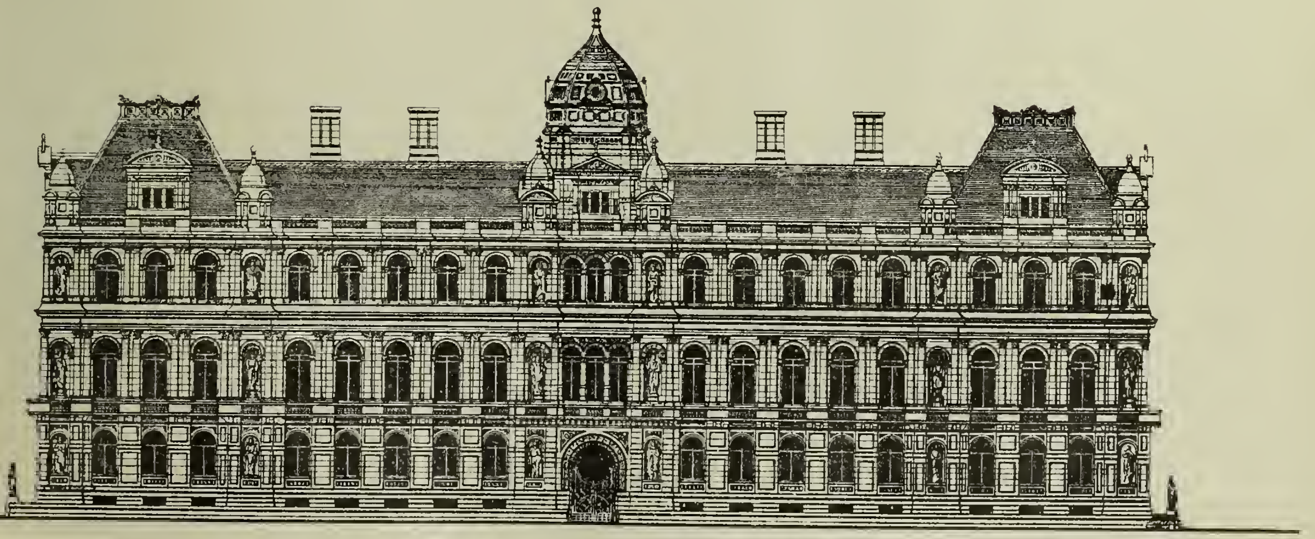
ELEVATION TO JOHN STREET.



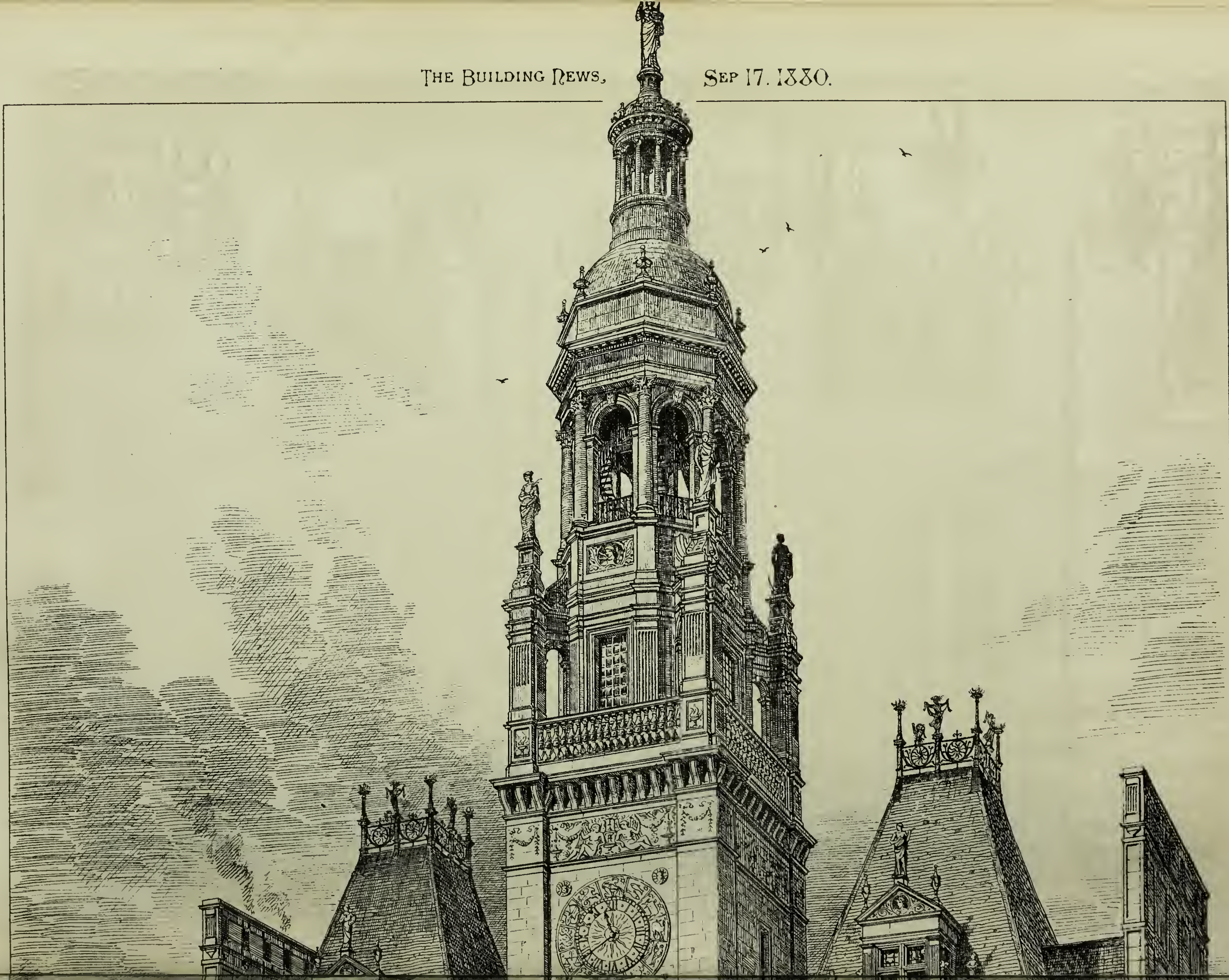
OF PRINCIPAL FLOOR.



PLAN OF FIRST FLOOR
(UP ONE STAIR)



ELEVATION TO GEORGE STREET.



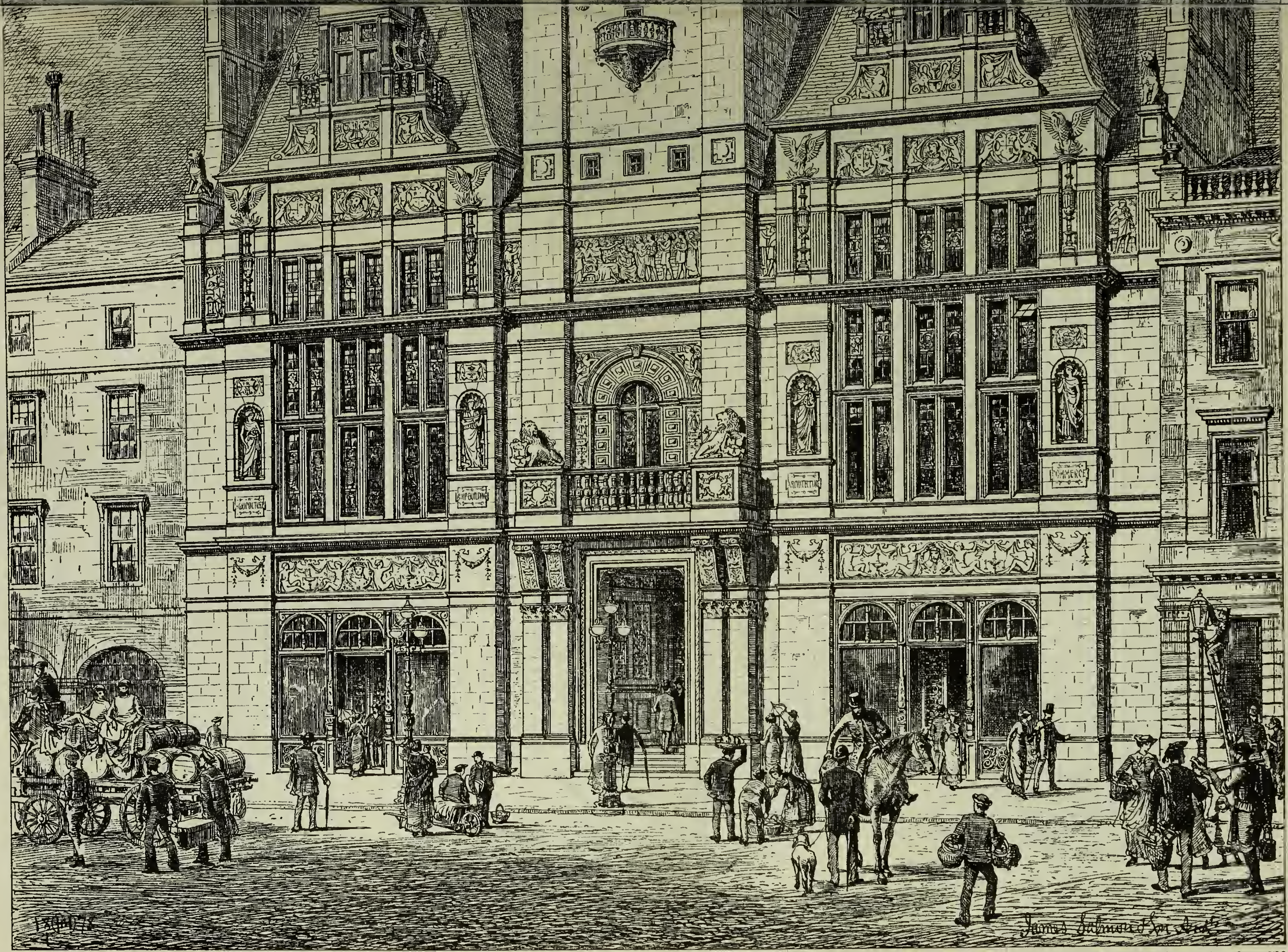
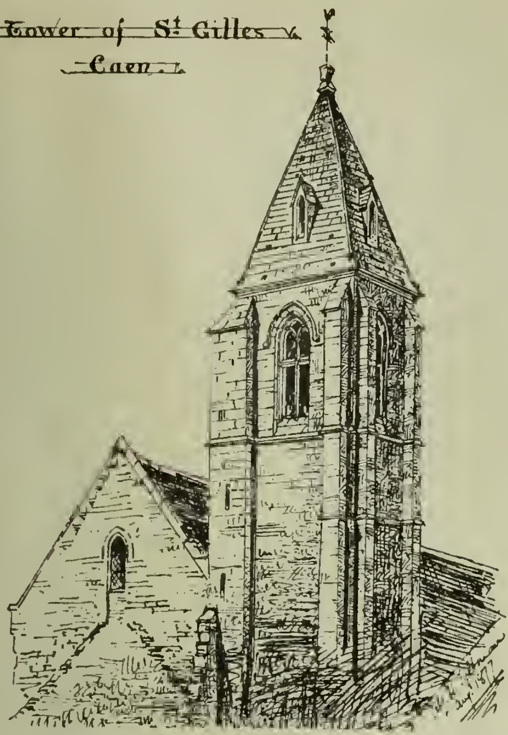
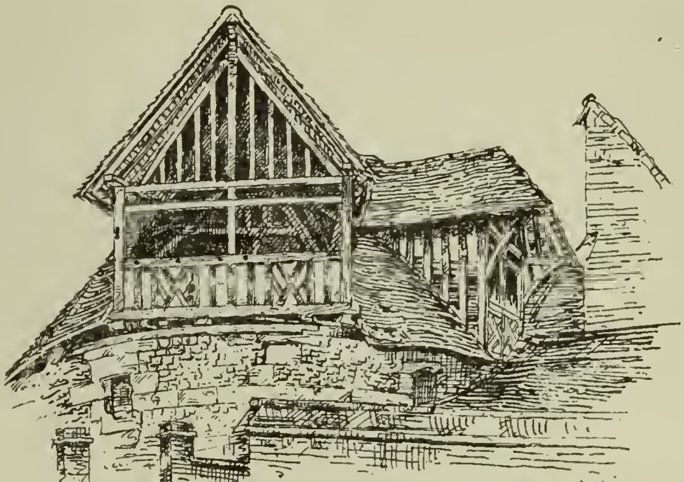


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

Proposed Building for the Trades' House, GLASGOW *James Salmon & Son* Architects

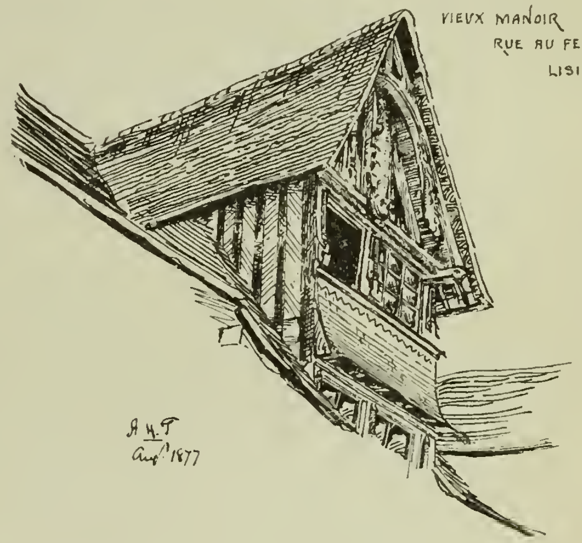


Tower of S^t Gilles. Caen.



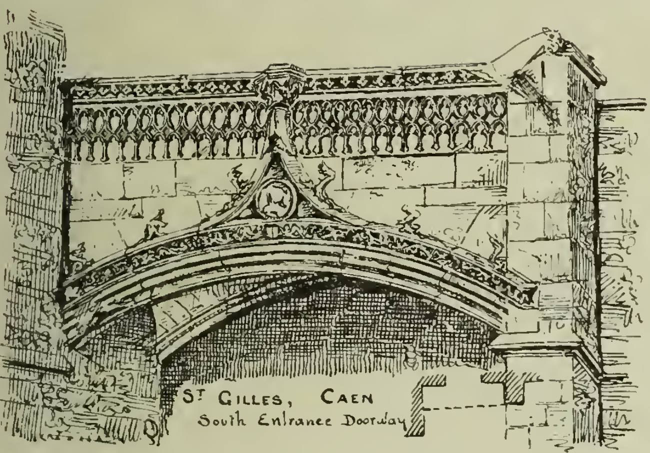
The top of one of the projecting Towers in the Town Wall of Lisieux

Alf. H. Tiltman Sep^t 1877

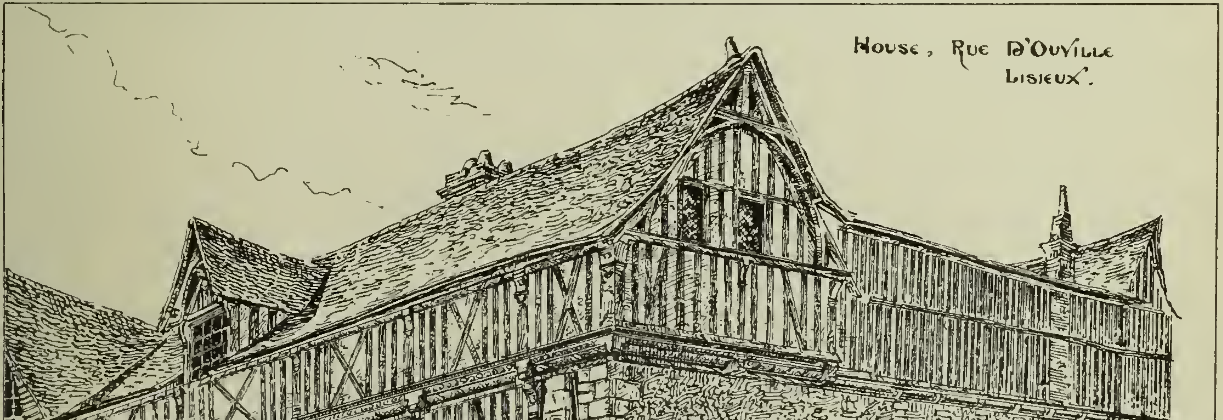


VIEUX MANOIR
RUE AU FEVRE
LISIEUX.

A. H. T.
Aug^t 1877



S^T GILLES, CAEN
South Entrance Doorway



HOUSE, RUE D'OUVILLE
LISIEUX.

Alf. H. Tiltman Sep^t 1877

Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

SKETCHES FROM CAEN & LISIEUX

THE PREMIATED DESIGN FOR THE PROPOSED MUNICIPAL OFFICES, GLASGOW.

It is only fair to remark, with reference to the illustrations which we publish to-day of the first premiated design for the new Municipal Offices at Glasgow, that they are by no means so good as we could wish, but they will serve the purpose for which they are intended. At the present stage of the competition any drawings of the selected design for the first prize of £750 must be of extreme interest, and so we have reproduced the four elevations and two principal plans from photo-lithographic reproductions of the original drawings, kindly furnished us for the purpose by Mr. George Corson, architect, of Leeds, the author of the design. In describing his design, the author says, after enlarging upon the respective merits of the three chief varieties of Classic architecture—the Fenestral, the Roman, and the Palladian, as he calls them, "the third variety is that which I have adopted as the most suitable in every respect for a civic structure of many stories and varied uses. There are many examples of this style in Italy, France, and England. The Library at Venice and many of the palaces there, the Hotel de Ville (destroyed by the Commune) at Paris, the Banqueting-house at Whitehall, and the Carlton Club in London may be cited. In this style the columns never rise through the height of two stories, but each story has its own complete order of columns with the windows between them, and the columns and pilasters are usually attached to the wall. This style has great dignity of character, is much more varied and lively than the Roman, and expresses admirably the character of a building which includes large apartments for civic hospitality as well as for civic business. The general arrangement of the plans is based upon the city architect's arrangement, but are modified to suit the architectural scheme of the exterior, and the heights of the stories, floor to floor, are as follow:—Basement floor, 13ft.; ground floor, 22ft.; first floor, 17ft., and the second floor varies in height according as the rooms rise into the roof, or have other rooms over them. The entrances are placed as on Mr. Carrick's plan. The principal one in centre of the George-square front, the entrance to telling-room in centre of the John-street front, and the two carriage entrances in the centres of the two other fronts in a line with each other. The two entrances to basement in John-street are so contrived as to be kept below the ground-floor, and to leave the windows above them to light that floor. The front entrance is by a lofty archway, 11ft. wide by 20ft. high, which will be closed at night by a wrought iron gate rising from below, and hung with counter-balance weights. The porter's room is on the left, and passing through swing-doors in a glass screen the vestibule is entered. This is 25ft. square, with large domed niches in the angles, and statuary on pedestals in each niche. The tower stands over this vestibule, and ascending the steps the grand hall and staircase is entered by another archway. The carriage entrance in the court is by an open loggia or covered arcade, 40ft. by 12ft., which gives admittance by numerous doors to a vestibule 60ft. by 23ft., in which, on right hand and left hand, are recesses for the reception of cloaks, unbrellas, &c. An easy flight of nine steps leads up to the grand staircase, meeting on a level the approach from George's-square. I have endeavoured to improve upon the sketch-plan in the matter of direct access to the staircase, and to obtain greater standing area for parties waiting for their carriages. The staircase being in duplicate will give much greater facility for crowds of people entering and leaving the building. The grand hall and staircase, 62ft. by 34ft., contains two stairs, right and left of the hall, which is divided from them by screens of columns and arches. These lead up to the first floor, and are so arranged that the landing forms a spacious upper hall, 34ft. by 17ft., with the council-chamber at one end, and the reception-room at the other. The council-chamber, 45ft. by 37ft., is different in proportion from Mr. Carrick's, and is arranged with semi-circular ranges of seats rising from the centre table. It will comfortably accommodate the entire council, and has also recesses, 23ft. by 9ft., at each side for reporters and deputations, with small galleries over for the public. The principal entrance to the council-chamber is from the centre of the principal landing, and there are subsidiary entrances to the recesses for reporters and deputations from the side landings. The entrances to the galleries for the public is from the landings over those last named. In convenient proximity are the Lord Provost's rooms and committee-rooms. The Council office-room will also serve as a robing-room for the Council, and the necessary lavatories and water-closets are provided close to it. The reception-room is entered from the grand staircase, and has also an entrance from the Lord Provost's room. The saloons will form a magnificent approach to the Town Hall, and will be of their full width of 30ft. throughout, expanding at the angle into a square of 42ft. They are divided from each other by pillars and arches, and when the doors to the reception-room are thrown open, the large mirror at the south end will prolong the vista. The ante-room and staircase interposed between the saloons and the hall will be of use in allowing this hall to be used in connection with either the upper or lower saloons. The interior of the Town Hall has a narrow gallery at the sides, forming on one side a series of boxes, and at the west end a deeper gallery, communicating with the upper saloons. The hall will be lighted by two tiers of windows towards George-street, and at night by sunlights, which will also ventilate the hall. The staircase is lighted partly by windows in the side, over the council-chamber, and partly by light from the roof over stairs. The roof over landing will not be glass; but the ceiling will be in the form of a waggon-vault, deeply coffered and carved. The serving-lobby, stair, and corridor are placed to one side of the saloons, instead of blocking up the end; and the kitchens are placed in an entresol between the first and second floors of the gas and water offices, thus getting rid of all smells of cooking, &c. The lift and the stairs give communication with these. Retiring-rooms for the ladies are arranged on the first floor, and also on the second; and for the gentlemen in an entresol between those, and also on the second floor. The corresponding entresol over the Council officers'-room is arranged as a retiring-room for the members of council. Retiring-rooms for musicians and performers are provided in an entresol on the same level as the kitchens, and access is given from the platform by a stair in the wall of east-end, which communicates by a separate and distinct flight in the staircase adjoining. In the town clerk's department the arrangement adopted is substantially that of the sketch-plan. The caretaker's house is placed in the basement, and comprises all the accommodation required. Water-closets and lavatories are provided in various places. Strong-rooms are provided to several of the offices, and a large room in the basement for safes. The areas in the court are made of ample size, so as to allow of good lights to the various rooms and passages abutting upon them. The telling-room for the collection of rates, with the offices connected with it, follows very much Mr. Carrick's arrangement. I think the latter is very good, and I have made only trifling modifications. A dressing-room is provided here as in the other departments, and water-closets are placed in convenient positions. I do not require to describe minutely the departments of Dean of Guilds' Court, Office of Public Works, Lands Valuation, Clerk of Police, as they follow so closely the arrangements on Mr. Carrick's plan. Open fireplaces are shown to nearly all the rooms. I would, however, strongly recommend that a system of heating by hot water should be adopted for the building generally. For this purpose, I have arranged a boiler-house under the carriage-way of court, which will accommodate six large boilers, two of these to be reserve boilers, in case of accident or cleaning, and four of them to be allocated, each to the separate service of a distinct section of the building. Large coal-stores are provided—one for boiler slack and two others for the open fires. These are all under the carriage-way of court. The boiler-house and coal-cellars require to be sunk to a greater depth than the rest of the basement to give the required height. Their floors will be 7ft. below the basement floor. I propose to run subways to the lifts from the coal-cellars, so that the coals may be taken direct to them, on the level, without ascending stairs. I propose to build the outer walls of Dunmore stone, with an inner lining of brick. The inner walls would be built of brick entirely, and the walls fronting into open area over telling-room, as also the outer area walls, would be faced with white glazed bricks to give reflected light. The construction of floors I propose to be fire-proof throughout, and would consist of wrought iron beams and joists, filled in with concrete on temporary centering. The corridor floors may be finished with tiles upon this foundation, and the ceilings in plaster. I propose to construct the roofs with wrought iron principals and purlins, upon which the spars will be fixed, and to cover the roofs with dark Westmoreland slates. The domical termination of towers, however, would be covered with lead, and the floors of the various rooms would be finished with wood, carried upon joists placed over the fireproof construction. The doors and finishings throughout I propose to be of pitch pine, varnished. The windows will be fitted with French casements, and glazed with plate glass. The total cubic contents of the building amount to 3,008,795ft., which, at one shilling a foot, amounts to £150,432. Judging from recent experience in the erection of buildings of a similar class, which have not cost so much per foot cube as I have allowed here, I consider that these municipal offices may be erected for about the sum named; but a great deal will depend upon the manner in which the interior finishings are carried out. This sum will cover the cost of the building, as shown on the drawings, with a moderately-finished interior. Extra magnificence in the town-hall and saloons will, however, entail extra cost. In conclusion, I may say that I have endeavoured to produce a design for this building that will be worthy of the city of Glasgow, and of the magnificent site which you have chosen for it." Mr. Corson's motto was "Carton."

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NOTES FROM EDINBURGH.

The architectural appointments of the cathedral church of St. Mary may be said to be now complete, with the addition (lately made) of its sculptured story for the reredos. The space set apart for the choir includes that below the tower, and all its accessories are of a costly description. The stonework is in marble and alabaster. The low parapet at entrance to the choir presents a range of richly-carved panels and medallions, and the plain spaces are covered with elaborate mosaic. Floor and steps are marble; the simple pattern of the former is much enriched by the contrasted colours and variegated hue of the selected marble. The communion-table is simple but ornate in construction, and in oak, the top being of a dark green marble. The ironwork which screens the choir from the aisles is remarkable, not so much for intricacy of design, as for the exquisite finish of the workmanship in its every detail.

The reredos forms a very striking object, meeting the spectator's eye as a large monument in alabaster; but placed at some distance from the wall behind. Its colour is in striking contrast with the stonework around, and the vacant spaces at each side are hung with dark olive-green curtains, so that, even at a distance, no one can mistake it for mural decoration. As yet, there is nothing to rival its glory; and even when the windows behind it are filled with stained glass, and tell their own story, too, the sculpture will be read with greater advantage as to light. At present, the best point of view is from behind the iron screen, where the eye is not troubled with the glare of the large windows.

The structure nearly fills the central space; the base, though mostly covered by the table, is high enough to show its richly-carved cornice over the dark marble. The design is very simple and effective. A large crocketed gable, with finial and foliated cross, with two seraphim on each side, is carried on a pointed arch, buttressed by two lateral projections, each wide enough to accommodate a figure in its niche. These figures represent St. Columba and Queen Margaret. Behind the first member of the arching, and well recessed, is the second—a large trefoil, richly carved. These arches are carried on shafts of red and dark green marble. The innermost arching forms the top of the tripartite recess, in which the principal piece of sculpture is placed. It is carried on four dark green marble shafts, the bases resting on a plinth, decorated with four medallions representing angel-heads. These shafts divide the subject into three divisions, each having its own portion of the story. The largest and central portion represents the Crucifixion, with the principal figure in high relief. Others especially mentioned in the text are placed with characteristic aspect, and in well-studied attitudes, around; the whole making an intelligible picture of the scene, from the artist's point of view. The work is from the studio of Miss Grant. In the side-panel to the left of the cross the centurion and other Roman soldiers are seen, and its companion on the other side discovers the mocking priest and other Jewish spectators, the background representing the environs of Jerusalem.

The tone of the alabaster is pale red, looking white in the gaslight, when the whole appears to great advantage in the distance. This tint forms necessarily a weak setting for the sculpture; but the architectural effect does not suffer on that account, as at any but the closest distance the details of sculpture are lost, and the imagination, in any case, must fill up the picture.

The interior lacks only the stained glass for its eastern lights. Few even of the old abbey churches were more richly decorated in the stonework of construction. The perspective from the western entrance is a grand procession of curved and moulded lines. There are no clustered nave-piers; but above the line of the capitals we have the lofty clustered corbel shafts and their intermediates, the window-piers of the triforium, and the Norman edgings of the clerestory lights, which serve as a rich setting to the pillared shafts of the windows. There are the lines of the great tower piers, and richly-moulded arching of all the great arches of construction, losing themselves in pleasing intricacy at the transepts; the whole presenting as fine an example as could be wished of the effect of mouldings in the decoration of a building.

An interior such as this teaches also something of the great value of sculpture in the decoration. The eye wearies of the beauty of this perpetual repetition of curved and linear lines, and gladly rests on the sculptured foliage or faces which generally arrest the eye at principal points of support. Very likely, it was this feeling, and not the basket of flowers, which suggested the Corinthian capital as a relief from the monotony of Doric and Ionic lines. It was surely a happy thought of the Gothic builders which stopped a moulding here and there with some suggestion of organic life, and other forms of beauty. Natural analogies justify the proceeding, for Nature conceals her strength in many ways, and structural supports are clad with beautiful and tender forms without adding to the appearance of her strength. There is no reason, æsthetic or constructive, for banishing such sculpture from bosses, capitals, and corbels, and confining it to panelled surfaces, as lately suggested by a writer in the Building News. The question is not, as he unfairly puts it, between bad sculpture and good mouldings; but between bad sculpture and bad mouldings. It is quite as easy to design mouldings as sculpture thoughtlessly, and probably quite as common; and it is more than likely that the former might be more dangerous, constructively speaking, than the latter. For sculpture-foliage, just in its proportion to its exuberance, is generally cut from a proportionably greater amount of material not necessary in construction. Nobody but the writer alluded to ever dreams of the function of such ornament being anything but ornamental. The sculptured foliage of St. Mary's, both outside and inside, is utterly and entirely free from the "flutheriness" of ill-designed sculpture, and always indicates a marked sympathy with the lines of pressure or resistance. In obtuse angled capitals, it adheres even too closely to the plane of surfaces supported. The foliage is always beautiful, and never irrationally placed, like the specimens in an herbarium, and with no suggestive connection with the surface it is intended to adorn. Doubtful sculpture is perhaps as good, at any rate, as bad mouldings or odd angular stops, and, besides, may be justified or preferred on the ground that "a little nonsense, now and then, is relished by the wisest men."

The new University buildings are making rapid progress towards completion in the southern portion, which, it is hoped, may be ready for occupation by the close of the coming session. This is now in the plasterers' hands. The north frontage makes some show over the hoardings; but the builders have been engaged lately in the erection of a lofty chimney-stack, which has just been completed. This structure is about 18ft. diameter at the base, dwindling to about 12ft. and will be about 200ft. in height. It is built of pale brick, and harmonises well with the stonework below and around it. Some parties are possibly sceptical as to the possibility of such an erection being made consistent with the dignity of a building consecrated to the advancement of learning; but they have only to visit Edinburgh to be undeceived, and possibly they may go far and wide to find a better example of architecture in a chimney of the size. At a distance probably of 40ft. from the top, there is bold corbel projection, marking the base for the ventilating outlets.

The structure is not a chimney, pure and simple, but a ventilating shaft, with the real chimney, an iron pipe, in the centre. These outlets for the vitiated air are high doorways. Above them is another great projection, with bell-cast weathering, and the mouth of the chimney, probably 25ft. higher, is domical in outline, and the whole of this portion has the appearance of an elongated bell.

Stone is hardly anywhere employed. The proportions of the upper portions and more ornamental part of the design give the whole a monumental character, and make it quite worthy of its place amid the towers and spires of the city. There is nothing in it to suggest any sudden transit from the sublime to the ridiculous, which is more than can be said of "high" art as exemplified in the Melville Monument, in which the noble viscount is taking the air 140ft. from the ground, on the top of a Doric pillar.

THE GLASGOW MUNICIPAL BUILDINGS COMPETITION.

THE following is the copy of the letter transmitted by Mr. Barry to the Town Clerk together with his report on the Competitive designs, the tenour of which we gave last week.

1, Westminster Chambers,
30th August, 1880.

Gentlemen,—As I anticipate that my Report may possibly be published, I have been careful in it to confine my remarks precisely to the issues referred to me to decide, to do which satisfactorily to my own mind has not only consumed much time, but occasioned me much anxious thought, as will be evident from the report itself.

There are, however, some remarks that I should wish to place before the Corporation on matters which have pressed themselves on my attention during the inquiry.

1st. The Corporation will not fail to gather from what I have said in my report that (as I think) the sum of £250,000 at least should be expended on their new building to obtain a fitting result.

2nd. It will also be evident to you that I have had practically to make two separate examinations of the designs sent in—one as to their relative merit, irrespective of cost, and putting quite aside the £150,000 named in the Instructions, for which sum I feel sure that Mr. Carrick's plan, if built in any satisfactory way, could not itself be carried out; the other, having as near regard as I could to the proposed outlay of £150,000, as it might fairly be interpreted by Competitors, and under which consideration it is evident the premiums must, in justice, be awarded, and have, therefore, been so by me in my Report.

As to the first examination—viz., that as to the relative merit of all the designs submitted, which is by far the most really important to the Corporation—I need not say that if my award is adopted, and after the premiums therein recommended have been paid, I shall be ready to advise the Corporation, should they request me to do so, or to aid them in their final action in any way consistent with professional etiquette.

3rd. One small matter I would refer to in this letter, as it has been already the subject of correspondence between you and Mr. Carrick, and some of the Competitors. It is as to putting a black or neutral tint in the window openings of the design, which has been done by some and not by others, who have feared that they might thereby be supposed to violate the eighth paragraph of the Instructions. As I read that paragraph, there is nothing to forbid this being none; and, indeed, I think it would have been well to require all to do it, just as certain flat tints on plans are needed to distinguish voids from solids. The tinting or etching which is very rightly forbidden by the eighth paragraph of the Instructions, can only have meant such casting of shadows in colour or pen work as would perhaps make showy effects, but which effects might have been, in reality, unproducible by the design.

I need hardly say that, in my examination, the tinting or not tinting in flat Indian ink of the window openings have not influenced my judgment in the slightest degree, and I could not but feel the absurdity of setting aside a better design for a worse, because some of the Competitors have (I consider erroneously) thought they were forbidden so to finish their drawings.

Lastly.—As to additional area which may, and probably will be, required for public uses arising out of the erection of this new pile of important buildings.

Preparatory to my consideration of the designs, I, of course, carefully viewed the intended site, and saw the Parliamentary plan under which it has been acquired, and, from it, I observe that a considerably larger area has been scheduled than that supplied to the Competitors for their designs; and further, that power has been acquired, if found necessary or desirable, to close John-street as a public carriage road. May I be permitted (without being deemed presumptuous) to express a strong hope that the compulsory powers to acquire this further area (before the time named in the Act shall expire) will be made use of.

It is obvious that if this is not so, and the new buildings are erected, a large additional annual value will be thereby given to this further area, and the cost of it, if it be found necessary to obtain it after the compulsory powers have lapsed, will be very largely increased, whereas it could now be acquired on the basis of its present annual value (with 10 per cent. for compulsory sale and expenses). The rents, existing or improved, would, of course, be receivable by the Corporation until it might be so required, and would yield a moderate but increasing return on the purchase money; while, if it be found, with some years' experience, *and after the new buildings shall have been erected and in use*, that it is not required for public purposes, it would obviously command such an increased price at sale as would partly, and, perhap, entirely, repay the Corporation for the cost of its acquisition, with interest for the intervening time.

I have the honour to be, Gentlemen,
Your most obedient servant,
(Signed) Charles Barry.

THE WESTMINSTER VESTRY HALL COMPETITION.

SOME dissatisfaction seems to exist with regard to the award in this competition; one competitor, who seems to feel strongly about the matter, writes us to say that Mr. Barry's report "was kicked out by 15 votes to 10" at the Vestry-Committee meeting held on the 7th inst., and not, as we stated last week, rejected by 13 votes to 10. The following circular has been in print and circulated in Westminster for more than a fortnight:—

Some time back a circular was sent by your direction to several architects, inviting them to send designs in competition for your proposed parochial offices, and I was one of those who answered to the call. The instructions set forth in detail your requirements, which appeared to have been minutely studied even so far as regards the dimensions and heights of the whole of the rooms. A plan of the site was supplied, which, together with the circular, instructed competitors that they might *light over the land adjoining to the east.* This is a most important point, and to which I beg to direct your especial attention. No mention was made of an arbitrator, nor was this surprising, the assumption being that those who knew so well what they wanted would also know when the right plan was laid before them; but, to the astonishment of many, a referee was called in, and as his printed report has been made somewhat public his award remains no longer a secret. The first objection he makes to several of the designs is the proposition to build to the verge of the site and light the rooms from the land adjoining—a step, I submit, beyond the limit of his instructions, if the reports in the periodicals are to be accredited. He then proceeds to arrange the designs in his order of merit, and places first a design with the wildest and most misleading estimates, with one staircase to serve not only for the house but for the general public—sweep, costermongers, anybody and everybody are to use it, destroying all privacy and separation. Further on he advises that for this plan, which he suggests may be re-designed, you should pay £100 and the usual percentage beyond what it may cost to carry out, viz., £23,000, although the author has said that £15,000 will be sufficient. Of the design placed second I can say nothing, as I do not remember the public description of it; but of that placed third, the large hall in the rear, 'tis said, is nearly covered by a gallery at each end, that is to say, is nearly all first floor, and, in addition, possesses the objectionable features of No. 1. Compactness is a point with the referee, but the designs he recommends for premiums have the committee-rooms at a distance from the hall instead of opening from it. Damage to light of schools is another point, yet the chief mass (the vestry hall) the highest of the group, is placed centrally to the longest axis of the site in the referee's recommended plans, and must interfere very much with the light of the schools. Allow me again to observe that as you have been so well able to instruct the competitors you must be equally well able to decide upon the plan which gives most nearly what you have asked for, and, in conclusion, I respectfully invite you to judge for yourselves.

OBITUARY.

WE regret to record the somewhat sudden death of Mr. John Messer Knight, J.P. for Kent, of the firm of Knight, Bevan, and Sturge, cement manufacturers, of Northfleet. But two hours before his decease Mr. Knight was performing his magisterial functions. He had held the office of chairman of the Northfleet Local Board since its formation, and he was also a Commissioner of Land Taxes. He had entered the sixty-eighth year of his age, and his strict integrity, coupled with a kindly and genial disposition, had gained for him very general esteem in a wide circle of friends and acquaintances. In politics he was a Liberal, rendering a hearty and consistent support to his party. But a few years since he retired from the active duties connected with his position as head of the firm, being succeeded by Mr. Thomas Bevan. His remains were on Thursday week interred in the cemetery attached to the meeting-house of the Society of Friends at Rochester, in the presence of a large concourse of people.

One of the most respected working-men in

Exeter has just passed away. Mr. Stephen Shute, of Heavitree, who died after a few days' illness, of cholera, on the 3rd inst. at the early age of 42—was well known to many architects as Mr. Harry Hems' foreman. He had only returned home from Belgium a fortnight before his death. His natural abilities and a quiet unassuming way, which was peculiarly his own, won for him friends in every position in life. His funeral was one of the largest that has taken place in Exeter for years. His body was borne the whole distance to the Whipton Cemetery, (2 miles) by those amongst whom he had toiled for many years—followed by many hundreds in procession. He has left a wife and nine children behind him.

Building Intelligence.

Beighton.—The foundation-stones of a new Wesleyan chapel were laid at Beighton, on Wednesday. It will be a Gothic edifice, built of rock-faced Yorkshire stone, with dressings of tooled Matlock stone. In front will be a large, deeply-recessed central doorway, with moulded pointed arch, and on either side will be pointed windows. The chapel itself will be divided from the schoolroom at the back by a lofty arcade, fitted with sliding partitions, so that both may be thrown into one room when further accommodation is required. The plans were drawn out by Mr. J. H. Kent, architect, Chesterfield, and the builder is Mr. B. Fewkes, of Beighton. The building is estimated to cost, when completed, about £1,100.

Camberwell, S.E.—Camberwell-green Congregational Church, a large Middle-Gothic chapel, erected a quarter of a century since, was reopened on Sunday week by the pastor, the Rev. Dr. Clemance, after the completion of works of internal renovation and decoration, and the introduction of an organ. An endeavour has been made to lighten the effect of the interior, previously sombre and heavy. The panelling of ceiling has been altered from a dark oak to a cream tone, the ribs recoloured to harmonise therewith; the walls have been treated in grey, and broad lines of light colour introduced on matchboard ceiling beneath the continuous gallery. The richly-carved pulpit has been brought forward, widened, and lowered, and behind it has been erected, at a cost of about £500, an organ, containing great CC to G of 6 stops, swell CC to G of 8 stops, pedal CCC to G of 6 stops, and three composition pedals both to great and swell organs. The case is of pitch-pine, varnished, and the displayed pipes are decorated in seven secondary and tertiary colours, freely relieved by gilding. Choir-stalls of pitch-pine, with large carved ends and poppy heads, flank the pulpit on either side. The structural alterations and decorations have been carried out by Messrs. Downs, of Walworth, under the direction of a committee; the organ was built by Messrs. Foster and Andrews, of Hull, and is the gift of Mr. Keen.

Carthusian Monastery in Sussex.—Between Brighton and Worthing there is being erected a large Carthusian monastery, to be dedicated to St. Hugh, an offshoot of the Monastery of the Grande Chartreuse in the mountains of Dauphiné. The estate is about 350 acres, of which 15 are covered with buildings. The architect is M. Normand, and the building is nearly as large as the parent house. To give an idea of its magnitude, it may be stated that the main court is larger than the Tom Quad at Christ Church, Oxford, or the great court of Trinity at Cambridge, and is surrounded by a range of cloisters with stone-fretted vaults. The inclosed area is to be laid out with gardens and fountains; and a tower and spire of enormous height will rise above the southern gates. The chapel is to be of cathedral-like dimensions. The library, the refectory, and the chapter-house will be on a grand scale. Each choir monk will have a bedroom, sitting-room, two workrooms, and a separate garden. Fishponds, a windmill, and a lake are being constructed, and the nucleus of a good library is already formed.

Dublin.—Considerable progress has already been made with the erection of the new agricultural buildings of the Royal Dublin Society, at Ball's Bridge, and it is expected they will be completed by December next. The length of the buidings is 277ft., and their width 164ft. The internal covered space, exclusive of the entrance building, is 242ft. by 160ft., and covered by three spans of roof, the central being 60ft., and the two side ones being 50ft. wide. Each span is supported on cast-iron columns, 28ft. high and 24ft. apart, and rolled iron girders rest on them, carrying the trussed iron girders of the roof. The entrance building contains the boardroom, secretary's and other offices, cloak and ladies' rooms, and the entrance hall. The walls of the building are of rubble granite, with red brick quoins and red brick dressings to windows, &c., the front masonry being hammer-dressed, with solid stone and brick cornice to the front and sides, and moulded stone and brick pediment in the central part of the front elevation. The contractors are Messrs. Collen, Brothers, of Dublin and Portadown, and Mr. Wilkinson, of Great Brunswick-street, Dublin, is the architect. The amount of the contact is between £11,000 and £12,000.

Dunfermline.—The building plans for the Dunfermline Free Library—prepared by Mr. J. C. Walker, architect, Edinburgh—have been approved and passed by the Library Committee. The plan chosen is one of three which were designed by Mr. Walker. The style is Domestic Tudor. The front is 82ft. in length, and is two stories high, with ranges of square-headed windows with single mullions, the rebates of the lower windows being plain moulded, and the upper having attached columns, with carved capitals. A moulded string-course runs along the centre of the greater part of this front, and the wall is surmounted by a plain moulded cornice filled in underneath with blocks. The principal entrance is near to the corner of this front, which at this point is treated so as to give the appearance of a square tower, and is carried a story higher than the rest of the building. The interior arrangements consist of a library-room measuring 57ft. 3in. by 25ft. 6in.; recreation room, 26ft. 6in. by 25ft. 6in.; gentlemen's reading-room, 34ft. 3in. by 25ft. 6in.; ladies' reading-room, 22ft. 6in. by 18ft. 10in.; smoking-room, 28ft. by 16ft.; and a keeper's house, containing three rooms and kitchen with other necessary conveniences. The whole of the premises will be ventilated by Boyle's patent ventilators, and heated by Perkins' heating system of hot water and coils. The site and buildings are expected to cost £5,000.

Eccles.—The foundation-stone of a new town-hall at Eccles, near Manchester, was laid on the 13th inst. The building is of the Classic style of architecture, and comprises in the basement a hall-keeper's residence, heating apparatus, coal and store cellars. On the ground-floor a board and committee-rooms, with ante-room, hat and cloak-room, lavatory, &c.; adjacent rooms are also provided for clerk, surveyor, collector, and inspector. The upper floor comprises a publicroom, with gallery and platform affording accommodation for 1,000 persons, also retiring-rooms and other requirements. The principal elevations will be faced with stock bricks, relieved with Huddersfield stone to the doors and windows, &c. The contract has been undertaken by Messrs. Thomas Moore and Sons, builders, of Eccles, at a cost of £4,000, and carried out under the superintendence of the architect, Mr. John Lowe, F.R.I.B.A., of Manchester.

Fortwilliam. — St. Andrew's Episcopal Church, Fortwilliam, was consecrated last week. The building is from the design of Mr. Ross, architect, Inverness, and is in the Early Decorated style, and consists of a nave, a chancel, and tower and spire, with a vestry at the west angle and a porch at the north-west angle. The tower, when complete, will be 100 feet high. Its base forms the organ-chamber. The material of which the church is built is red granite, with freestone dressings. The choir-benches are of oak, the carving having been executed by Mr. Harry Hems, of Exeter. The altar is ten feet wide, the front divided into three compartments by arches with columns. In the centre compartment is the St. Andrew Cross, enriched in alabaster, and in the south is a pelican feeding her young. The litany-desk and prayer-desk are carved in oak by Mr. Hems. The internal walls are relieved by bands of white freestone. The windows are filled with stained glass, by Messrs. Clayton and Bell, of London. The cost has been about £10,000.

Kirkby Malzeard.—The church of St. Andrew, Kirkby Malzeard, four miles from Masham, was opened on Tuesday. The restoration of the church had long been talked of, but it was not until the winter of 1875-6 that the idea took definite shape, when the churchwardens propounded a scheme of restoration, suggested by Mr. Arthur W. Blomfield, M.A., architect, of London. The north wall was propped up by immense ugly buttresses, built upon the old ones; this has been taken down and rebuilt after the original model, and buttresses similar to the ancient ones substituted for the unsightly masses of masonry. In this wall were two Early English windows, which have been replaced. The church consists of nave, very long chancel—almost as long as the nave—north aisle, and continuation as chancel aisle; at the east end of the chancel aisle is the vestry, with priest's chamber above, reached by a newel or spiral staircase. The vestry and chamber project slightly beyond the east end of the chancel, and in this small projection are slit windows in both vestry and chamber, looking south. The walls have been replastered in the inside; the roof, which was very low-pitched—especially in the chancel—has been rebuilt at the same height, the inside, so far as the chancel and chancel aisle are concerned, being lined with pine, and in the nave and aisle, plastered between wooden framework. The total cost of the work, including glass and furniture, will be about £4,000. Mr. R. Weatherley, of York, was the contractor.

Langho.—The consecration of the new church, dedicated to St. Leonard, Langho, the foundation-stone of which was laid in September, 1878, in lieu of the old structure erected in 1557, is arranged to take place on the 25th inst. The church, which is of Early Curvilinear design, from the drawings of Messrs. Paley and Austin, of Lancaster, contains a nave, south aisle, chancel, and organ-chamber on the south side, and choir and clergy vestries on the north side. The cost of the structure so far completed is over £4,000.

Lozells.—The new church of St. Paul's, Lozells, was consecrated on Saturday. Mr. J. A. Chatwin, of Birmingham, is the architect, and the builders, Messrs. Horsman and Co., of Wolverhampton. The church is capable of comfortably seating 800 persons, and is built in the Perpendicular style. It consists of a nave, spacious chancel, and north and south aisles. The nave is 91ft.3in. long by 24ft.8in. broad, and the chancel is 30ft. 6in. by 24ft. 8in., thus making a total length from the east to the west windows of 121ft. 9in. The aisles are each 12ft. 6in. wide. Externally the north and south sides of the church are of plain brick, but the principal front is faced with Hamstead stone, with Bath stone dressings. The total cost of the church, inclusive of the site, is upwards of £8,700.

Maghull.—On Wednesday the Bishop of Liverpool consecrated a new church at Maghull, built from designs by Mr. J. T. Doyle, architect, of Liverpool; the contractor having been Mr. J. Leslie. The church consists of chancel and chancel transepts (the south transept being used for an organ-chamber, and the north as a chapel for school children), nave and two aisles, western tower (used as a baptistry), and detached vestry. The architecture is Gothic of the Early English period. The carving in the chancel is by Mr. Rogerson, of Liverpool. The lectern, of oak, and the altar-cloth are by Messrs. Jones and Willis. The encaustic tiles in the chancel were specially designed by the architect.

Pinxton, Derbyshire.—The memorial-stone of new schools was laid on August 24th. The ground-plan comprises a schoolroom, 54ft. by 25ft. 6in., with classroom, 15ft. by 15ft., with two porches, affording accommodation for 200 children. The roofs are open, with framed principals, stained and varnished. The walls externally will be faced with common bricks, relieved with bands of stocks also to arches of windows, weatherings to buttresses, &c, and internally with common bricks. The roof will be covered with Welsh slates and red Staffordshire ridge-tiles. The cost of the work, exclusive of the fittings and boundary walls, is £550, which is being carried out by Mr. John Bird, builder, of Pinxton, under the superintendence of Mr. John Lowe, F.R.I.B.A., of Manchester.

Royal Hotel, Blackfriars.—The second portion of this large establishment is now making rapid progress under the hand of Messrs. Lucas

Bros., who have the contract for the building work. Visitors to the Hotel will ascend by hydraulic lifts; these are on what is called the continuous ram principle which consists of a ram or piston of a length equal to the whole height to be lifted, this works in a cylinder sunk in the ground. No lifting chains are used. Perfect safety is thus insured, also ease and noiseless working, and freedom from vibration. No expense has been spared to make them perfect and absolutely safe. Mr. E. A. Gruning, F.R.I.B.A., is the architect who has designed the building, and Mr. Frederick Colyer, M.Inst.C.E., is the engineer who has designed the lifts and the engineering appliances, and will superintend the erection of same with the architect.

St. Anne's-on-the-Sea, Lancashire.—New schools for 200 children have just been completed, consisting of two departments in an L shaped form; there is a mixed school for 140 boys and girls, 54ft. by 24ft., with two class-rooms adjoining, a room for 60 infants, 28ft. by 20ft., with gallery. The principal entrance between, with lavatory and cloak-room, leads to both schools. The rooms are 15ft. 6in. high to the wall-plate and 29ft. to the ridge, the roofs being open, with curved principals. The walls are of solid brickwork 18in. thick, boarded inside for 3ft. 6in. high, and plastered above; the roof is plastered against the spurs. The windows are glazed with Hartley's patent rolled plate, cathedral tinted, in lead diamond quarries, having coloured margins. The design is of simple Gothic character, in good plain brickwork, with splayed stone jambs and mullions to the windows and doorways, and splayed weatherings to the buttresses; in the east gable is a large four-light tracery window. The roofs are slated with Welsh slates having ornamental red ridging. Ample provision is made for ventilation by grates in the floor, casements in windows, and openings in gables. The rooms are warmed by ordinary grates in bold stone chimney-pieces. The site (which was given by the lord of the manor) is very spacious, and is inclosed by brick walls neatly coped; the accommodation can be doubled by erecting rooms of the same size in a reversed position so as to form an ⊔ shaped block, when required. The works have been satisfactorily carried out by local tradesmen, under the superintendence of Messrs. Longworth and Gardner, of Preston. The entire cost, including all fittings, forming and enclosing playgrounds, and architect's commission, has been £1,300.

Tywardreath. — The parish - church of Tywardreath, near Par station, Cornwall, was reopened on the 8th inst. after entire rebuilding, with the exception of the tower at west end, and a granite arcade of seven bays on south of nave. Till recently the church was in dangerous and uninviting condition; high pews filled the body of the church; the old fittings had disappeared, one huge gallery blocked up the south transept, and another the tower arch; the roofs were concealed by plaster, the walls and arcade were all leaning, and confusion and dirt reigned supreme. All has been changed. The new open roofs are copied from the old work and in nave, transept, and a portion of south aisle, they are of pitch-pine. The chancel and chancel-aisle roofs are boarded and panelled in oak, with carved bosses. The walls are built of local stone, the dressings are of Pentewan stone, in which material is executed most of the internal masonry. The old oak pulpit—apparently built up from old carved pew-heads—has been refixed at the north corner of chancel step on a base of Portland stone. The passages are laid with encaustic tiles, by Messrs. Minton, Hollins and Co., of Stoke-on-Trent. The windows have been filled with tinted and coloured glass by Messrs. Fouracre and Watson, of Stonehouse. The seating in nave and aisle is of pitch-pine, open and with square-headed ends. The stalls and the new parclose screen, shutting off the chancel from the Rashleigh or south chancel aisle, are of English oak, and have been carved by Mr. Harry Hems, of Exeter, who also carved the heraldic devices on seats in the Rashleigh aisle. The bosses and wall-plate of roofs and the pulpit base were carved by Mr. West, of Plymouth. An old stone altar was found embedded in the floor of the Rashleigh aisle, and has been reinstated and supported a massive oak framework. Mr. Coad was the architect.

York.—On Tuesday week a floriated cross was fixed on the gable of the south transept of York Minster. The cross is upwards of 4ft. in length, and is in the thirteenth-century style, to harmonise with the architecture of this part of the venerable pile. It occupies precisely the same position which the old cross did, of which it is a faithful reproduction, from a design by Mr. Street, under whose supervision the restoration will be brought to a termination at no distant date. The restoration of the south transept was commenced in 1871, by the liberality and public spirit of the late Dean. The interior of the south transept was restored and its ceiling beautified, this portion of the work being finished in the autumn of 1874, and a grand opening ceremony, extending over two days, was held early in November. The exterior will now be soon out of the workmen's hands, when the scaffolding will be taken down, and the boarding from the entrance to the transept to the east end removed, when the fine proportions of the southern portion of the choir and Ladye-chapel will again be brought to view, and the inclosed ground within the barricades will be cleared and properly laid out. As to the entire cost of the restoration, it will amount in round numbers to £50,000. The new floriated cross, although upwards of 4ft. in length, looks small when viewed from below. It is the same size as the original cross, which was taken down by Archbishop Blackburne about the year 1730, and succeeded by the crocketed pinnacle, surmounted by the fiddler, which ought never to have been placed there, but is now taken down.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Received.—B. of B.—J. V.—T. Evens.—M. and Mc. Co. —G. W.—E. J.—B. of A. and L.—J. F.—A. B.—P. W. —V. P.

Drawings Received.—Canon Davies.—H. W.

Correspondence.

QUANTITIES.

To the Editor of the Building News.

Sir,—Instances of incompetence, similar to those referred to in Mr. Reid's two letters, are common enough. Whether produced by architects or quantity surveyors, is a matter of little moment; but it is of the highest importance that the work of both branches of the profession should be well done, and the separation of the functions of architect and quantity surveyor is an element of improvement.

Whatever may be the cause, the fact remains that a bill of quantities produced in an architect's office, ostensibly by him, is, in the majority of cases, a bungling production partly from the want of the special training of a quantity surveyor, and also because the architect has, in many cases, acquired the impression that the quantities produced by an expert surveyor are needlessly elaborate.

We are too apt too forget the homely proverb, "Jack of all trades, and master of none." The condition of architectural design at the present time is a good proof that the art of architecture is a sealed book to many of its practitioners. The tendency of all the best practice of the last twenty years has been in the direction of a separation into the two branches before referred to, and the outcry against it almost invariably comes from the incompetent part of the profession. If the status of architects and surveyors could be raised, there would be no need for the architect to supplement his architectural work with quantity work, or for the quantity surveyor to practise architecture.

The title of architect or surveyor is, to the majority, synonymous with pretence; the facility with which many architects furnish designs gratis, or with small chance of payment, the readiness with which they work at all manner of percentages, 3, 2, 1, has led the outside public to form a very singular estimate of the profession generally; and, one does not wonder, when one knows that the smallest of the before-mentioned percentages is, in many cases, not cheap. The large number of highly-educated, competent men in the profession of architect and surveyor owe it to themselves and the public to distinguish themselves from this residuum of empirics. The way appears to me plain—a compulsory diploma for both architects and surveyors, for, although a diploma will never insure art, it will give us a warrant of the capacity of the practitioner which we can obtain in no other way.

Mr. Hughes's paper was, in my opinion, a very temperate and true statement of facts, and it is a matter of astonishment to me that the Builders' Societies do not take steps to produce a combined action for the refusal of such quantities as he describes.—I am, &c.,

John Leaning.

Sir,—I have been much amused by reading in the last two numbers of the Building News, what professes to be a criticism of my paper on Quantities, as published by you on the 13th August.

Your correspondent Mr. Reid, in his second week's letter admits, *he has but imperfectly looked at my paper*, and yet he occupies seven columns of your valuable space not in criticising any of the real points in it, but by indulging in the use of a vast amount of abusive and scurrilous language, charging the master builders all round with motives of the basest character; he makes assertions which cannot be justified, and which would be grossly libellous if made concerning individuals instead of a class.

I don't know who this Mr. Reid is; but I feel quite certain he is neither architect, surveyor, or builder, and, as he professes to write for others besides himself, inasmuch as he uses the words "we" and "us," I think it due to your readers and to myself that something should be known of Mr. Reid's "qualification" to vilify the character of the whole company of contractors, ridicule surveyors and young architects, as being subject to the wily influence of builders, and champion the cause of quack surveyors, whose work he himself describes as "grossly careless," "loose style," "meagre," "loose manner," "unhealthy state," "the evil is widespread," "imperfect," "cannot be defended," &c. &c., perhaps Mr. Reid will enlighten me still further before I decide whether or not I should reply in detail to his extraordinary epistles. I must however, ask him, under all circumstances, not to expect much Latin, no subtle charges of motives and dishonesty, unless I am prepared to prove them; and lastly I am willing to show him not only my "hand" but my foot, and he will then see he was mistaken when he fancied he saw my "cloven foot," and if I do reply in detail I will try to show him many of his assertions, groundless, quoting his own words, "It is wonderful how assertions, even when boldly stated by a skilled hand (I bow low to you, Mr. Reid), if turned round and examined vanish into mid air and leave but a faint trace behind them of their previous existence."

To give Mr. Reid fair play, I give him time to read my paper *perfectly*, a copy of which he can have by applying to myself or Mr. Knox, the Secretary of the National Association of Master Builders. In the mean time I will briefly recapitulate the points of my paper as dealt with by Mr. Reid. If I understand him he approves of my remarks as to the *meaning*, *use*, and *advantages* of a bill of quantities. *He agrees* with me that quantities are frequently taken in a very slovenly hap-hazard fashion by incapable men, and that they ought to be correctly taken by someone qualified or able to do the work. *He does not disagree* with me as to the cost, or, as to who bears the cost. *He shirks* the questions as to who appoints the surveyor, who *is* responsible for the surveyor's work, who *ought to be* responsible, or whether or not it is desirable that quantities should form the basis of a contract. *He agrees* with me as to the mode of measuring work. *He shirks* the questions of the advisability of rejecting faulty quantities, weeding out impostors, or of the desirability of surveyors giving some proof or guarantee of their fitness for their work, or of the fact that hundreds of builders are ruined by the inefficient work of incompetent and irresponsible quantity-takers such as he has described. In fact, he agrees with most of my arguments of any importance and disagrees with none, but has taken advantage of an opportunity for letting off a vast accumulation of animosity towards master builders generally, that must have been corked up for some time, judging from the explosion last week.—Yours faithfully,

Edward Hughes.

Liverpool, 14th Sept. 1880.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—The general competitors have much reason to complain of Mr. Barry's report. Instead of choosing the best design, he simply selects the cheapest! He says he felt bound to base his award on the condition that the building could be erected for £150,000. Yet the magistrates at their meeting had said they knew this sum was insufficient, and were willing to give more; the competitors knew this, and they acted accordingly. They, and Mr. Barry also, of course, saw the impossibility of a building of such a size, with any reasonable kind of exterior, being executed for the sum named. It was an admitted absurdity; yet on such baseless conditions he founds his report!

As a practical man, too, he ought to know—must know—that a building with four ornate elevations cannot be done at a shilling a foot, at which he calculated. The stone which will be used is a hard sandstone, and I expect the elevations in the courtyard, as well as those to the streets, will be expected to be of stone. It is not, however, that eight fronts cannot be done for a shilling a foot; I limit the assertion to four, and say that Mr. Barry ought to know better. What he paid for the Art Union building in the Strand I should like to know. If four fronts cost a shilling, the Strand building, with one front and lighter construction, should have been done for ninepence. Was it so?

I notice two acts of unfairness in the first prize design. The windows are tinted, contrary to the instructions, which says no tinting will be allowed, and the author most unfairly ignores, in the elevations, the necessary flues for his fireplaces.—I am, &c., M.

COMPETITIONS AND THE PROFESSIONAL ARBITRATOR.

Sir,—Mr. Charles Barry seems to have done his best, in making his awards in the Glasgow and Westminster competitions, to convince the 1,300 or 1,400 architects who signed the recent memorial to the Institute that even with the benefit of a professional arbitrator competitions are not rendered any more pleasant or satisfactory to any of the parties concerned than they would be were those persons by whom the buildings are required left to select for themselves.

The reports appear to me most astounding productions, and the selections such as no board or committee could ever have arrived at. In the case of the Glasgow competition, Mr. Barry commences his report by saying he was bound, in the first place, to consider the cost named by the Corporation (£150,000), and to make his award accordingly; in other words, I presume, to give the premiums to the best designs which could be executed for something like the sum proposed to be expended, and to set aside even better designs if more costly. In this the fairness, I think, everyone will agree. Mr. Barry then proceeds to award the first premium to a design which, he says, will cost at least £220,000. He afterwards tells the sorely-perplexed Corporation that there are some much better designs ranging from £180,000 upwards. Why pay £220,000, if a superior building can be had for £180,000?

In the Westminster competition he seems to have forgotten that he was in any way bound to consider the cost named in instructions to architects (£15,000), or, perhaps, he has given it the same *consideration* as he has at Glasgow; for in this case he has selected three of the most costly designs, ranging from £21,000 to nearly £24,000.

He also says the designs submitted "may be roughly divided into two principles of treatment, as far as plan and bulk of building is concerned, viz., those which are so arranged as to obtain their window-lights wholly and only over the area shown on the plan of ground issued with the instructions, and the other, those who depend more or less largely on lights obtained over the adjacent land to the east"; and in the next paragraph says, "It will be obvious that the first class avoid any interference with the ancient lights of the schools on the west side." This may be very obvious to Mr. Barry, but, I must confess, I am so obtuse as to fail to see what the east wall of the new building has to do with the ancient lights of the schools on the west side, or why, when pierced with windows, it should interfere with them, but when built as a blank wall it should not do so. Of course, as Mr. Barry justly observes, it is desirable not to depend upon light from the vestry's adjacent land on the east, because to do so would diminish its value (*and thus practically increase the cost of the building*). Do none of the designs recommended for premiums depend more or less largely on lights obtained over the adjacent land to the east—the very thing he condemns? If the public are at last permitted to inspect the designs, we shall see.

Mr. Barry further recommends that the author of the design he places first should receive a present of £100, because it will be necessary for him to prepare "entirely new plans"! Such are the benefits to be obtained by the vestry with the aid of a professional arbitrator. I, for my part, declined signing this memorial to the Institute, for of what benefit can it be to any board or individual to have a number of designs submitted, and then not be able to select that which they think best? In choosing an arbitrator they must be prepared to have a design selected which it is ten chances to one they do not like, and endure all the annoyance and vexation of setting aside others which they do approve of. Surely this is absurd, for if they are not to be allowed to judge for themselves, it would be far better for them to abandon competitions altogether, and instead of choosing an arbitrator, or allowing the Institute to choose one for them, to select an architect in whom they have confidence, and instruct him to prepare a design. In this way they would have some chance of getting what they require. Who would think of inviting a number of tradesmen to submit samples of goods, and then asking another of the same trade to select for them? Or who would think of taking the advice of a number of physicians or solicitors, and then calling in another to say whose advice or opinion they should take? There may be some who do such things, but they are not over wise, I think, for, as it is evident, it is the one who is called in to finally advise in whom they have confidence; they might as well go to him in the first instance, and thus save time and money. If, on the other hand, they feel that they are themselves the best judges of what they require, let them select for themselves. Those who do not like competitions on these terms are not bound to enter into them. Doubtless many mistakes occur, and the best design is not always chosen, either by board or professional arbitrator; but this is the case in all kinds of competitions. Can anyone pretend to suppose, say, in a Civil Service examination, that those who obtain the highest number of marks are always those the best qualified for the posts they are to occupy? No; if we are to have competitions at all, we must be content to take them as they are. There is much to be said both for and against the system.

A young or unknown man, with his reputation yet to make, would argue in favour of the system; but one who has already made his name would be glad to see it abolished tomorrow. In fact, all the argument for and against the system resolves itself into this: that it is a good thing for men unknown to the public, as it often enables them to make a name, which otherwise they might have little chance of doing, whilst, on the other hand, it deprives those who are known of many a good piece of business.—I am, &c.,

Hugh Roumieu Gough.

THE ALEXANDRA PALACE INDUSTRIAL EXHIBITION.

Sir,—Having read your review of the Industrial Exhibition at the Alexandra Palace, I beg to make certain corrections so far as regards my own work, "classed No. 2," in your description of Sept. 10. The satinwood bordering of the walnut fireplace and over-mantel is entirely painted by hand, not stencilled as described.—I am, &c.,

John Beauchamp.

OLD FARM-HOUSE AT SALTFORD.

Sir,—As remains of buildings of the Norman Transition period are very rapidly disappearing from this country, I beg to call the attention of your readers to an old farm-house near the church at Saltford, Bath. A large Transition window remains, very perfect, with several Norman fragments in the walls below it; the large window has been partially blocked up by a modern buttress, but enough remains exposed to show the design, and a careful examination would, I think, probably prove the ground floor and one piece of the main house to be Norman strengthened in the early 15th century by angle buttresses. The wing of the house is either Jacobean or later date. Upon the eastern gable a lion is carved upon the apex stone, or rather, probably, upon examination, it would prove to have been removed there from the earlier building below. In the parlour is a late-period Gothic chimney-piece with a Jacobean top of arms, and a date not of the same date as the chimney-piece. Altogether, the house is very well worthy a visit from any antiquarian travelling that way; it is reported to have belonged to the Abbey of Keynsham, and may possibly have been the Grange.

My visit was a hurried one before breakfast, so that I had not time to examine it carefully. Situated just below the scene of the battle of Lansdown, the house must have witnessed some exciting scenes in that eventful day, but my object in writing is to preserve the recollection of a very early house.—I am, &c.

T. S. Pope.

JUSTICE TO IRELAND.

Sir,—Your correspondent, "Vitruvius Caledonius," in visiting this country, and giving your readers his decidedly favourable impressions, has offered no small share of that "justice to Ireland," which all so largely and loudly demand, and it is to be hoped that many others, profiting by his example, will come and "do likewise." In speaking of the picturesque situations of Irish towns, he makes a special exception against Belfast, and, though taste is notoriously a matter of individual caprice, I am at a loss to imagine how he could have entered that town, either by rail or steamboat, without being struck by its surroundings, there being seven or eight hills, all over 1,000ft. above the sea-level, and most of them precipitous, within a radius of five or six miles from the centre of the town; nor, how he could have walked through its streets without being impressed by the mountain wall which forms, apparently, the terminus of so many of them. As an Englishman who has seen most of them, I would incline to say that Belfast will compare favourably with any town of the same size in the British Islands, except, of course, Edinburgh, which is, admittedly, both in picturesque beauty, and in learned fame, the *true* "Northern Athens." It is a little surprising that your correspondent, who seems to have been on the quest for good specimens of modern Gothic, should have overlooked, whilst in Belfast, Mr. Lyun's fine Carlisle Memorial Church, and also the late Mr. Hevey's Catholic Church (especially the spire) in Donegall-street; also when in Dublin, whilst noticing the Findlater Church, in Rutland-square, he should not have somewhat to say in praise of Pugin's Church in Thomas-street, which, if anything, would have reminded him of Continental specimens.

It is also a pity, though, no doubt, time may have been limited, that, as he so justly admires Mr. Street's restoration of Christ Church Cathedral, Dublin, that he did not visit the extremely interesting restoration of the old 13th-century Cathedral at Kildare, now far advanced, under the direction of the same architect. Your correspondent has shown that there are many modern buildings of importance to attract architectural tourists to Ireland; may I, through you, remind them of Mr. E. A. Freeman's statement, that, of the minor Romanesque styles, Ireland possesses the most interesting, the remains of which cover a period hardly represented in England, and that, moreover, it has been so grafted on to native and original Celtic style, that the two appear now to be one single growth, and offer a field of study to be found nowhere else in Europe.—I am, &c.,

F. W. Lockwood.

5, Corn Market, Belfast.

GLASGOW MUNICIPAL BUILDINGS.

Sir,—In your article of last Friday's date, an error has occurred; the designs described by you under the motto "St. Kentigern," are mine, and I will be glad that you correct this in your issue of next Saturday.—I am, &c.,

William Landless.

227, West George-street, Glasgow.
Sept. 11, 1880.

CHIPS.

A number of Roman remains have just been discovered at Risehow, near Flimby, during the construction of a colliery railway. Mr. Joseph Robinson, of Maryport, in a letter to a local antiquarian society, states that at first he thought they had come upon the Roman road to Maryport camp, for which he has made many tries at Flimby. The stones proved, however, to be parts of foundation of a building. The masonry is of fine blocks of grey freestone, well set, forming a 3ft. thickness of wall, and extending 13ft. 7in. each way, from an angle. Near by, a water-bottle with handle on one side, and charcoal 9in. deep, and containing small pieces of bone, proved that a burial had taken place. The proprietor of the Flimby Colliery has arranged for the deviation of the proposed railway, and has adopted means for the investigation of the remains, which are presumed to be those of a watch-tower.

An extensive fire occurred on Friday evening at the workshops of Messrs. J. Brass and Co., builders, situate between Old-street and Willow-grove, St. Luke's, and before the flames could be extinguished, a building of two floors 100ft. by 30ft. was almost destroyed. The cause of the outbreak is unknown. On the following night the workshops of Mr. Coad, builder, situate between High-street and George-street, Camberwell, were burnt down.

The bells in the parish of Dawlish are being re-hung with new framing, fittings, and chiming apparatus; the contract is in the hands of Mr. W. Aggett, of Chagford, Devon.

There has been recently patented in Germany a varnish for roofs, which is composed of 35 parts of clay slate, 30 parts mica slate, and 35 parts rosin, all finely powdered and heated with 50 parts of tar.

On Saturday the Mayor of Liverpool presented to a brickmaker, named Edward Parr, a silver watch and about £4 in money, in recognition of gallantry displayed in saving a little boy from drowning in a deep clay pit. The memorial was subscribed to by the Bishop of Liverpool, Lord Sandon, Mr. Whitley, M.P., Lord C. J. Hamilton, and about 200 others. Parr has been instrumental in saving a number of lives.

Intercommunication.

QUESTIONS.

[6222.]—**Ancient Lights.**—What is the present law in relation to ancient lights? An answer to this and to "Chips" (6207, Aug. 27th, 1880), would be gladly welcomed by many readers.—Walter T. Feldon.

[6223.]—**Mounting Drawings.**—What is the best method of mounting drawings on strainers? Should the mount paper be pasted on the linen before or after straining? If the former, should the drawing be pasted on before or after? Should the drawings be pasted all over, or only on the edges? Is the best material paste or starch?—B. D.

[6224.]—**New Roads.**—I should feel much obliged if some one could inform me whether a decision has been given respecting new roads, that "frontage" did not include sideage? I understand such a case was reported in your paper a few months ago.—Dot.

[6225.]—**Smokeless Stoves.**—Will some one conversant with stoves kindly answer the following questions:—1. What are the best smoke-consuming stoves? 2. Are they absolutely smoke-consuming, or only comparatively? 3. What is the principle upon which they are constructed? and, 4, what is the best method of converting ordinary register stoves so as to consume their own smoke?—B. J. D.

[6226.]—**Architects' Commission.**—In the absence of any written agreement between architect and proprietor as to charges, can the architect claim by law the usual 5 per cent. commission upon the outlay?—B. E. E.

[6227.]—**Burning Ballast.**—Having a large quantity of clay to burn for ballast, we should feel obliged by some of your readers' opinions as to the best way of doing same, with the probable cost, and the quantity of coal required per cubic yard; labour 3s. 4d. per day, coal 16s. per ton.—Constant Reader.

[6228.]—**Examinations.**—Could any of your readers give me the following information:—1. A list of the examinations that are beneficial to the student in a borough engineer's office? 2. Where could I obtain particulars of the several examinations? 3. What books would you recommend?—Nemo.

[6229.]—**Indentures.**—Will some reader kindly tell me whether, if I have my indentures cancelled, it will be any detriment to me in my future career? The architect I am articled to is giving up his business, and offers to cancel them. I have served a little more than 7-12ths of my time. There was no premium paid.—Pupil.

[6230.]—**Gas for Drawing Office.**—What is the best way of lighting a drawing table? The following points seem to be important:—1, kind of burner; 2, fixed or movable; 3, if movable, whether a jointed bracket or a burner on a weighted stand connected to the gas-pipe by a flexible tube is best; 4, height above drawing-board; 5, shade, if any.—X. X.

[6231.]—**Duke of Devonshire's Cottages.**—I notice in your issue of the 10th inst. some remarks upon the cottages erected by the Duke of Devonshire on his estate at Garrauribeen, Co. Cork, in which the R. Society advise every gentleman about to build cottages to study these plans. Can any one kindly inform me where the plans can be seen, and if published in any form?—W. Herring.

[6232.]—**Sloping Church Floor.**—While taking some photographs of Badingham Church, near Framlingham, Suffolk, last week, I observed that the floor of church slopes from east end to west door 6ft. The local tradition, as related to me by the rector, is that there is but one other instance of such an inclined plane to east in the kingdom. Is this so? Can any reader give the other example, or correct the assertion?—J. D. P.

[6233.]—**Glass Painting.**—I should be obliged if some kind reader, practically acquainted with the subject, would inform me if it is possible for an amateur to make the metallic colours used in the above with satisfactory results. Are professional glass painters in the habit of making their own pigments? If so, are the said pigments in any way superior to those procurable at the colourman's?—Architect Interested.

[6234.]—**Architects' Rights.**—Will any one inform me as to the legal aspect of the following:—After tenders have been procured for a house the proprietor desires the cost reduced; the lowest tender and the work are "cut down" to meet the pecuniary requirements. When the house is ready for slating the proprietor objects to some of the work as not being strong enough, expecting to find this portion as in the previous estimates. 1. Is the architect legally responsible for the so-called defective work? 2. Can the architect resign his position; and, if so, can he claim the percentage arranged for? 3. What is the legal and right way to proceed in the case?—J. D.

[6235.]—**Sub-Contracts.**—I am building some villas and sublet the brickwork, the bricklayer finding his own scaffolding, and agreeing to let me have use of same for other trades until roofed in and pointed down and his contract completed, he undertaking not to remove, or cause to be removed, same until his contract is finished. He overdraws and threatens to take his plant away. I serve him with a notice to say if I require I shall carry on his work and charge him with any extra expense. What step can I take to detain the scaffolding?—Old Subscriber.

[6236.]—**Ordnance Survey.**—Will someone please give the title and publisher of any work which fully explains the ordnance survey?—J. P.

[6237.]—**Dividing School Room.**—I am anxious to divide a girl's school-room from the infants' room by means of a movable partition or doors which, when away will allow the two rooms to be used as one for meetings or lectures. Will any of your readers kindly suggest the construction of the partition that it may be sound-proof? The width of opening is 20ft., and height to fitch beam 12ft. 6in. I have space for doors if folded back, but not for them to slide.—Z.

REPLIES.

[6217.]—**Band Saws.**—In reply to "An Estate Steward" for cutting hard, close-grained woods such as oak, beech, ash, &c., the gauge of the band saws employed should be as follows:—

Saws up to	14ft.	long	of any width	21	gauge.
,,	17ft.	,,	,,	20	,,
,,	20ft.	,,	,,	19	,,
,,	24ft.	,,	,,	18	,,
,,	30ft.	,,	,,	18	,,

The teeth of the saw should be more upright, and spaced finer, and the set-gauge less, than those used for cutting soft wood, such as pine. For woods of a woolly fibre, such as poplar, the teeth of the saw would be coarse in space and set. The saw-wheels should not be of too small diameter, say, not less than 30in., as the saw blades are more likely to fracture over small wheels than large, owing to the more acute angle at which they impinge on the periphery of the wheel. The saws should be set with a blow in preference to bending, as the teeth stand better to their work. As regards the amount of set necessary, no arbitrary rules can be laid down; but, roughly speaking, the harder the wood the less the set required. As regards the correct speed for the saw to run at, about 4,000 feet per minute is the speed given by Powis Bale, who is considered an authority. In conclusion, I can strongly recommend "An Estate Steward" to get a recently published book, entitled "Woodworking Machinery, Management of Saw Mills," &c, by M. Powis Bale, M. Inst. M.E., published by Crosby Lockwood and Co. He will find in it a large amount of useful information.—An Old Chopstick.

WATER SUPPLY AND SANITARY MATTERS.

Bromley.—Mr. J. T. Harrison, C.E., an inspector of the Local Government Board, held an inquiry on Tuesday into an application made by the Local Board of Bromley, Kent, for sanction to borrow £10,500 to enable them to construct the Ravensbourne Valley Sewer, designed to drain Bromley and Shortlands, in the parish of Beckenham. It was explained that it was proposed to construct the sewer of an egg-shape, 3ft. by 2ft., and it would extend from Streamlet-place, near the station of the London, Chatham, and Dover Railway, to the West Kent sewer in the Bromley-road, Lewisham. Mr. Harrison intimated at the close of the inquiry that he should present a favourable report to the Local Government Board.

Cropstone.—For some time past, two new filter beds have been in course of construction at Cropstone in connection with the Waterworks belonging to the Leicester Corporation. One of these beds was completed on Thursday week, and about sixty gentlemen assembled to inspect the works. The filters are of stone from the Duke's quarry, Whatstandwell, Derbyshire, the materials used for filtering purposes consisting of stone from Swithland, upon which is placed sand, from the bed of the Trent, after undergoing a washing process. Mr. Thomas Hawksley, C.E., the engineer for the Waterworks Company previous to the transfer of the works to the Corporation, in 1878, has acted as consulting engineer to the latter body during the formation of the new filters, Mr. F. Griffith having discharged the duties of resident engineer and manager; the contractors being Messrs. John Wood and Sons, of Leeds. The total cost is about £8,000.

Parisian Sewers.—At the end of last year Paris possessed 156 leagues of canalisation for sewage, comprising the large sewer, the medium sewer, and ordinary sewers; besides 65 leagues of ramification of secondary importance. To complete the work, nearly 100 leagues in addition are needed; that is to say, the complete system of Paris sewers, once achieved, will exceed 300 leagues in total length. The Prefectoral Administration has prepared a long report on the project of effecting this completion; and this document will shortly be considered at a séance of the principal council.

River-Pollution in Sussex.—On Wednesday the question of the serious pollution of the river Arun and its adjacent streams was brought before the Horsham Guardians (as the rural sanitary authority) by Dr. Kelley, of Worthing, district medical officer of health. The report, which was a long and elaborate analysis of the sewage contamination of the Arun, stated, as the result of Dr. Kelley's investigation, that the pollution of the river, streams, and mill-ponds near the Broadbridge conjunctions of the above watercourse could be traced unmistakably to the defective outfall of the Horsham new sewage farm. Along the river, some distance west of the town, all the water had become a black, thick, offensive fluid, exhaling dangerous gases; and this was evidently the cause of the death of the preserved fish on Mr. Standford's estate. Dr. Kelley pronounced the sewage pollution of the river very serious as regards local public health, and detailed the results of his technical inspection as district officer of health. He had also found that the stench was unbearable in those branches of the River Arun agitated by the mill-wheels, and he called upon the Horsham Rural Sanitary Authority to lose no time in dealing with the pollution of the above waters. The guardians decided to co-operate with the Horsham Local Board in steps to be taken for remedying the evil.

LEGAL INTELLIGENCE.

How Suburban Dwellings are Built.—Heavy Penalties.—At the Edmonton Petty Sessions on Monday last, before Messrs. Abbiss and Howard, divisional justices, Mr. George Preedy, builder, of 69, Mayfield-road, Dalston, appeared to answer four summonses obtained at the instance of the Edmonton Local Board, which charged him with infringing the by-laws of the said Board, which provided that the walls of new buildings "shall be efficiently and solidly bonded and put together with mortar or cement." Mr. Houlder, solicitor and clerk to the Board, conducted the proceedings, and having briefly mentioned the facts, called Mr. Johnson, assistant surveyor, who deposed that in the course of his duties he visited certain houses which were being erected by the defendant at Jeremy's-green, Lower Edmonton. He noticed a heap of substance containing about 82 yards covered with sand. He obtained a spade and dug into the heap, and found that, with the exception of a slight coating of sand, it was common mould. He called the attention of the defendant to it, and he said he had purchased the heap as it stood. Witness told him that it must not be used for building purposes, and he asked to be allowed to scrape off the sand, promising not to use the soil. Witness visited the place the next day and found that it was not being used. On a subsequent visit witness noticed that the heap had been removed from the spot where he first discovered it to another place about five yards off. He went again the next day, and found that the mould had been covered with sand as before, simply as a blind. Witness remonstrated, and defendant said it had been covered by mistake. He was warned that the material must not on any account be used as mortar, and he said it should not. On the 23rd of August witness found the mould and sand being screened together; on the 24th being mixed; and on the 25th being used as mortar in the construction of four dwelling-houses. [Samples of the material were produced, and were easily reduced to dust between the fingers.] Mr. Houlder: Can walls be solidly bonded together with that stuff? Witness: No; I could easily knock the work down with my hand. Mr. Houlder: What do you say the stuff consists of? Witness: Of about eight parts of mould to one of sand and very little lime. In reply to other questions, witness said that loam is not a proper thing to be used at all in mortar. It must be something in which there was grit. He also stated that the material had been used as mortar to the height of from four to five feet over the whole area of the four houses. Mr. Grindle, chief surveyor to the Board, said he visited the buildings on the 25th of August with last witness, and took three of the four samples which had been produced. Being aware that they were watched, witness had driven sharply up by the back way of the buildings, and came upon the defendant actually mixing the mould and sand together. Mortar should consist of sand and lime, the protions varying according to the sharpness of the sand. With good sand the proportions might be 6 to 1. Mr. Houlder: Do the samples contain six of sand to one of lime? Witness: I should say one lime to sixty of foreign material. (Laughter.) Defendant said as soon as his attention was called to the bad material he pulled the work down and built it up with better stuff. Mr. Abbiss: I suppose it would have remained if you had not been found out? Defendant: It would. Mr. Abbiss: Pulling down the work, under such circumstances, is no answer to the charge. You should have used proper material at first. You were cautioned more than once; but you went on notwithstanding. You knew you were doing wrong. Defendant called a witness who said he was employed to manage the brickwork, and that he had used worse material in larger jobs. The mortar man was also examined, and said his instructions were to use all sand. It was his fault that any of the mould had been used. Mr. Abbiss said the case had been fully made out, and that the Local Board were simply doing their duty in seeing that houses were built that would be safe and sound. Defendant must pay the full penalty of £5 in respect of each house—£20, together with £1 12s. costs, and in default, a distress warrant would issue.

* * *

On Wednesday week the foundation-stone of the new Government offices which are in course of erection at the Docks, Cardiff, was laid by Sir Edward Reed, M.P., in the presence of a numerous assembly. The buildings, which will be in the Doric style of architecture, will contain accommodation for the Board of Trade, Mercantile Marine, Post-office, and Telegraph Departments. The total cost, inclusive of the land, will be about £20,000

Our Office Table.

A considerable revival has lately taken place throughout Norway in all departments of the timber and planed-wood trades, which have suffered severely from a protracted depression. The wood pulp manufacture, however, has fared better, the demand from Great Britain and France being persistently on the increase. At the commencement of the year there were 21 factories at work, the production for the last three years being as follows:—1877, 295,700cwt., value £78,300; 1878, 386,482cwt., value £96,000; 1879, 400,000cwt., value £90,000. Although the production in 1879 exceeded that of the previous years, prices were lower, from the great local competition; but as esparto grass has risen in value, it will very soon favourably influence the price of wood pulp, the more as the English paper-makers contracted pretty largely for paper pulp during the winter to the amount of 2,000 tons in excess of the ordinary demand. The wood pulp used in England contains about 50 per cent. of moisture, but the French paper-makers prefer having it air-dried, containing only 8 per cent. There are also four mills employed in making millboards from paper pulp. These are used for band-boxes, and are all sent to England. The export during 1879 was 700 tons, of the value of £7,200.

A Correspondent of the *Athenæum* says that Audley House, in Crane-street, Salisbury, dating from the early part of the fifteenth century, at one time the property of the Earls of Castlehaven, and more recently used as a workhouse, but now for some time unoccupied, is threatened with destruction, the Corporation having it in contemplation to sell it to the Dean and Chapter, on the understanding that a grammar-school should be erected on its site. It is earnestly hoped that one of the most beautiful and interesting specimens of our early domestic architecture may be saved from the fate which has unfortunately befallen so many of the old houses in Salisbury.

The revised Directory of the Science and Art Department of the Committee of Council on Education for 1880 has just been issued, and contains some important alterations and additions. With a view of avoiding any appearance of fraud in connection with the examination papers, it has been decided to appoint an officer or officers who shall be charged with the care of the papers, and who shall be personally responsible for their custody and distribution after their receipt by post. In future the teacher must give at least 28 lessons in each subject, of which, as heretofore, the student must attend at least 20. In regard to endowed schools the endowment of which exceeds £300 a year, or in which the education is wholly or principally provided by endowment, the question of earning grants on students of such schools will be specially considered in each case by the department. The syllabuses of some of the subjects have undergone modifications. In number the changes, which are not all enumerated here, are greater than have been made for some years.

On Thursday week, Mr. G. E. Street, who has had the supervision of the restoration of the south transept of York Minster, paid his last visit of inspection previous to the scaffolding being taken down from the southern façade of the transept. He expressed to Mr. Bradley, the clerk of the works, his warmest thanks for the excellent manner in which the great work had been carried out to its successful termination. Mr. Street also congratulated Mr. Milburn upon the satisfactory execution of the whole of the carvings, and especially for the artistic handling which he has displayed in catching the spirit of the old work. It is not intended to proceed with the western aisle of the transept until the question of the new Will Office is finally decided. It is nine years next November since the restoration of the south transept was commenced. The following have been the contractors:—Mr. J. Robinson, plumber, of Little Stonegate, for the leadwork of the aisle and transept roof; Mr. Rookledge, of Little Stonegate, for the new boarded ceiling, &c.; Mr. J. Thomas, painter, of Stonegate, for decorating the ceiling.

A trial of Baxter's new stone-breaker took place last week on the premises of the Atlas Ironworks, London-road, Derby. The inventor of the new machine is Mr. W. H. Baxter, of Messrs. W. H. Baxter and Co., engineers, 78, Albion-street, Leeds. Mr. Baxter's idea is what he calls a "knapping motion," and consists of quick movements which break the stones with, it is said, 50 per cent. less chippings, and makes a better sample of road-metal. Baxter's patent is worked by a radial reciprocating balance motion between the toggles and the driving shaft, which greatly relieves the driving shaft, and also gives a sudden action to the movable jaw (hence the term knapping motion), which greatly reduces the power required to work the machine. Very little oil is required to keep the working parts cool. It is calculated that two of these machines can be worked by the same power that it takes to work one of any other sort, and at the same time do double the amount of work, which, if the assertion be well founded, must mean an enormous saving to those who use this class of machine. The machine was not seen at its best at the trial, but according to a local paper it performed its work well. It was driven by the same engine which was driving all the machinery required at the Atlas Works, and the stone was slaty and bad for breaking; but notwithstanding these drawbacks, a good sample, with a small percentage of chippings, was turned out. It was stated that Baxter's patent will break six tons of stone an hour.

The northern district meeting of the association of Municipal and Sanitary Engineers and Surveyors will be held at Darlington on Friday next; the members will assemble at 11.30 in the Council Chamber. Those who purpose attending the meeting are desired to indicate the same by post-card addressed to Mr. P. W. Thomson, C.E., District Honorary Secretary, Willington Quay, Northumberland. The following papers will be read and discussed:—"Sheldon Sewage Disposal," by James Craggs; "Sanitary Appliances," by George Bell. During the day the Darlington Sewage Farm, the Darlington Ironworks, the Park, and the Darlington and Stockton Waterworks will be visited.

The Church Congress, at Leicester, opens on September 28 and continues till October 1. A hall has been erected close to the railway-station, of a size sufficient to contain the largest audience ever yet assembled on such an occasion, and specially adapted for the purposes of the meetings. Its acoustic properties are considered to be particularly promising. The town of Leicester is preparing to give the Congress a hearty welcome. The Mayor, Mr. John Bennett, is inviting the members to a *conversazione* to be held at the close of the proceedings. Offers of hospitality have come in from Churchmen and Nonconformists alike to an extent sufficient to provide for a considerable proportion of the expected visitors. An abundant supply of lodgings has been secured by the committee in addition to the accommodation supplied in the ordinary way.

Mr. Ford Madox Brown has all but completed his second fresco at the Town-hall, Manchester. The first historical event in connection with Manchester which can be either known or conjectured is depicted. The subject is the building of the Roman fort at Mancunium—the present Manchester—under the supervision of the Roman Governor of Britain. Due attention has been paid to archæological details, the legion whose name is inscribed on the sack (Leg. vi. victricis) being the one for whose stay at Manchester there is positive epigraphic evidence. The colours range through all shades of red, from a light vermilion to the scarlet of the governor's *paludamentum.* The wall is of the light red sandstone, which is still found in the neighbourhood of Manchester, its tint contrasting pleasantly with the brighter red of the brick tiles which cap it. There are one or two minor changes and additions still to make, but in a few days the fresco will, no doubt, be open to inspection.

On Wednesday the Yorkshire Fine Art Society opened its doors, in the Athenæum Buildings, Leeds, for the autumn exhibition. On the present occasion several works are shown by artists who have already established or are certainly making a reputation. Some of them are of very great excellence; and in the case of others, great progress is shown, as will be evident on a comparison between the examples hung now and in the summer. The hanging has been carried out by Mr. Thos. J. Gullick, himself an artist. Every work either above or beneath "the line" is so placed that it can be seen with little sacrifice of the beauty of detail. The new curator, Mr. James Dallas, has also done his work well. The arrangements have been so fully completed that at the press view on Saturday all the pictures were in their places, and copies of the catalogue were presented to those who attended.

The Science and Art Department of the Committee of Council on Education has published the following list of candidates successful in the Competition for the Whitworth Scholarships, 1880:—Arthur L. Jones, 20, engineer's apprentice, Carnarvon, value of scholarship, £150; Benjamin Angwin, 21, engine-fitter, St. Just, £150; Fred. R. G. Cockey, 20, engineer student, Frome, £100; Christopher J. Whittaker, 20, pattern-maker, Accrington, £100; William J. Tilbrook, 21, mechanical engineer, London, £100; J. W. M'Kenzie, 21, engineering student, Dublin, £100; William H. Potter, 19, engineer's apprentice, Nottingham, £100; Albert Frankish, 19, engineer, Manchester, £100; Charles Symons, 19, engineer, Dublin, £100. The following is the result of the examination for Whitworth Scholarship Prizes, 1880:—1. Scholars appointed in 1877;—William I. Last, first prize, £100; Fred. Ogden, second prize, £60; David A. Low, third prize, £50; William S. M'Kenzie, fourth prize, £40; Alfred D. Ottewell, fifth prize, £30. 2. Scholars appointed in 1878:—William Groves, first prize, £100; Joseph E. Needham, second prize, £60; William H. Tozer, third prize, £50; Zachary H. Kingdon, fourth prize, £40; Thomas Mather, fifth prize, £30; Thomas Duckworth, sixth prize, £20. 3. Final Competition of Scholars appointed in 1877:—W. I. Last, total marks, 8,602, first prize, £200; Fred. Ogden, 7,788, second prize, £100.

A piece of linen has been found at Memphis, containing 540 picks to the inch, and it is recorded that one of the Pharaohs sent to the Lydian king, Crœsus, a corslet made of linen and wrought with gold, each fine thread of which was composed of 360 smaller threads twisted together! The ancient Egyptians wove a fabric called the "linen of justice," or "justification." So beautiful and valuable was it that it was esteemed the most acceptable offering to the "Restorer of Life." A few handlooms can still be seen at work in the Eastern bazaars of Cairo, the cloth woven in which rivals in texture, colour, and design the finest glass screens of Munich.

A Leather Trades Exhibition, which is to last a week, was opened at the Agricultural Hall, Islington, on Wednesday morning, the object being to give the public as practical an idea as possible of an article which is used in close upon three hundred industries, and in the preparation and manufacture of which considerably over 300,000 of our workpeople are employed. There are on view a large assortment of manufactured articles, such as leather portmanteaus, hand-bags, cigar-cases, &c. Among the exhibits connected, however slightly, with leather, may be mentioned Whight's musical cabinetto, warranted to play any tune, requiring absolutely no knowledge on the part of the performer, and Humphreys' church and house building stall, the erector by the way of the recent Workmen's Exhibition Building in Victoria-street. A beautiful suite of Roman furniture, valued at £100, is exhibited by Mr. Rawlings, accountant, of London-bridge.

Mr. T. J. Gawthorp, of Long Acre, has sent us a copy of the fifth edition of his book of "Designs and Examples for Metal Work for Ecclesiastical and Domestic Purposes." It will be found useful to clergymen, architects, and others, by giving some general idea of the work he produces, and in also furnishing a list of prices at which this class of manufacture may be obtained from him. The book has been revised and enlarged, and will be found to contain a considerable number of new designs, upon which care and time seem to have been bestowed in the endeavour to furnish only such as shall be correct in point of taste and consistent with the true principles of art, and at the same time of a generally useful character.

On Wednesday a letter of some importance, as affecting the quinquennial assessments now in progress, was received by the Hackney Board of Guardians from the Local Government Board. The Board find that in some instances the Metropolitan Workhouses and Infirmaries are altogether omitted from the valuation lists, while in others the amounts inserted are considerably below the assessable value of the property, the result being that the contributions of the unions and parishes in question to the metropolitan common poor fund are necessarily based upon lower totals than they would otherwise be. With a view, therefore, of remedying this anomaly in future, the Board feel it to be their duty to impress upon the assessment committees the necessity of taking steps during the pending revision of the metropolitan valuation lists for insuring that all workhouse and infirmary buildings and other property used for Poorlaw purposes within the parish or union for which they act shall be duly entered in the valuation lists and assessed therein at their proper value. The Board remind the assessment committee that under the provisions of section 32 of the statute 32 and 33 Vict., cap. 67, it is competent for any board of guardians or assessment committee in the metropolis to appeal to the Assessment Sessions, if they should feel aggrieved at the total amount of the gross or rateable value of any parish being too high or too low. In the course of the discussion which followed, the chairman said the local assessment committee had made a valuation of the union premises, and always had done so, on what they considered an equitable basis; and Mr. Charles Kemp, the nominee guardian, expressed his opinion that it was a very great pity that workhouse and infirmary buildings should be required to be rated at all. The letter was handed to the assessment committee, to take such action upon it as might be deemed desirable; and they were further empowered to consult a professional valuer in the case of large properties such as those of the gas, railway, water, and cemetery companies.

Might not the society journals keep to their own attractive themes, and leave "engineering work" alone? Wednesday's *World* has the following:—"There is one improvement at the Lakes to which I confess that I am helplessly blind—that which the Manchester Corporation is supposed or supposes itself to have made in Thirlmere. The beauty of the little lake—let what may be said, one of the wildest and most romantic of them all—is gone. I saw the new embankment only from the main road at the 'Nag's Head' at Wythburn, whither I had gone for the purpose of climbing Helvellyn, and from the sides of Helvellyn itself, as long as it was possible to see anything; not near enough to appraise it as a bit of engineering work, but quite near enough to judge of its general effect." The writer of this, remarks the *Manchester Guardian*, has evidently been up in a balloon. Not a sod has yet been turned, nor a stone laid, of the intended embankment; nor, from all we hear, is the beauty of Thirlmere likely to be "spoiled" for some years to come.

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◆

CHIPS.

On Saturday, a new hall, built by, and intended for the use of, the miners of Ryhope, was formally opened. The dimensions of the structure are 70ft. long by 43ft., and accommodation is provided within its walls for 700 persons. The architect was Mr. Greener, of Sunderland, and the cost will be about £1,100.

The foundation-stone of a new parish-church, for Revelstoke, near Plymouth, was laid on Friday. The architect is Mr. J. Piers St. Aubyn, of the Temple, London.

In connection with a bazaar and exhibition for the benefit of the Cottage Hospital at North Ormesby, Middlesbrough, opened on Wednesday, there was a double exhibition of pottery of a novel description. The ceramic ware coming from Linthorpe, Middlesbrough, is now extensively known throughout the country. In addition to it there were exhibited articles of terra-cotta manufacture in artistic designs, which are perhaps a novelty to many. They were shown in two colours, buff and red, the former having a smooth, silky surface, which, relieved with turquoise enamel, produces a very artistic ceramic example of pottery. Flower vases, biscuit jars, teapots, candlesticks, and other articles were exhibited, and elicited considerable admiration. They are made at Commondale, near Whitby, by Mr. Crossley, formerly of Middlesbrough.

During a thunderstorm that passed over Stockport on Tuesday evening, the lightning wrought considerable havoc to the Teviotdale Wesleyan Chapel. A chimney-stack was knocked down, and several yards of roof torn away; a gas-pipe in the vestry was pierced, and the gas ignited.

A large turret clock is being made for the new town-hall at Kingstown, by Messrs. Chancellor and Son, of Dublin, whose tender has been accepted by the town commissioners. Every part of the clock will be completed in Dublin, from the casting of the bed-plate to the cutting of the wheels. The clock has four dark blue dials, 6ft. diameter, with gilt figures and hands, and is constructed on the new bed-plate system, with separate movements, and with a dead-heat escapement. The bells by which the hours and quarters will be struck have been cast by Mr. Sheridan, of Church-street, Dublin.

The foundation-stone of Kitching's memorial reading-rooms, Milnthorpe, was laid on Friday, the 3rd inst. The building will cost over £2,000, and will contain reading-room, 21ft. by 15ft., coffee-rooms, 16ft. by 14ft.; spacious entrance-hall and staircase. On first floor will be a lecture-room or concert-room, 37ft. by 21ft., approached by a handsome staircase of pitch-pine; on the same floor will be a library and retiring-rooms, &c. Above will be rooms for playing chess and bagatelle, &c. The building has been designed, and will be carried out under the personal supervision of Mr. Eli Cox, architect, Kendal.

The twenty-third annual report of the Hampstead Vestry, just printed, furnishes some interesting particulars respecting the growth and the sanitary condition of this favourite residential suburb. The period embraced is the year ended March, 1880. Mr. Charles H. Lowe, the surveyor, states in his annual report that the length of roads, streets, courts, alleys, and footpaths under the control of the vestry is 34 miles 552 yards. The total expenditure on account of highways, including special works, was £31,434 17s. $0\frac{1}{4}$d. The charges on account of sewers was £17,074 5s. $4\frac{3}{4}$d. The removal of slop, &c., from the parish roads cost £2,444 5s.; and the removal of dust and ashes from houses cost £1,256 4s.; road-watering cost £1,081 14s. 9d. The report of Dr. Gwynn, medical officer of health, estimates the present population of the parish at 45,500, and the approximate number of inhabited houses at 5,600. The birth-rate was 22·98 per 1,000, that of the preceding year having been 21·4. The death-rate was 13·07, or, deducting non-residents, the low figure of 12·4, as against 13·25 for the preceding year. The death-rate in 1879 for the whole of London was 23·3.

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THE BUILDING NEWS.

LONDON, FRIDAY, SEPTEMBER 24, 1880.

CLASSIC ARCHITECTURE IN GLASGOW AND LONDON.

THE North of England has, from various causes, favoured the growth of Classic architecture. Its soil of rock, igneous and stratified, has promoted solidarity, restricted the forms of construction, and methodised and regulated the laws governing architectural composition. The climate of the North has induced regard to security and comfort; while the national habit of thought has impressed the buildings of the great towns with a dignified decorum, and a sobriety of effect, we seldom see in the South. Going northwards, the traveller from London loses sight of the flexible and varied methods of construction common where brick and stone, stucco, slate and tile, timber and thatch, prevail; he becomes aware of a totally different style and feeling in the buildings after he passes Rugby or Stafford, and enters the red sandstone districts of Cheshire, Yorkshire, Shropshire, and Cumberland—indeed, he quickly perceives that the architecture of the districts in a great measure becomes identified with their geological strata. A truthful and localised architecture is invariably influenced by this fundamental difference; but there is clearly an influence of another kind which is gradually tending towards breaking through these local peculiarities, and this is mainly the facilities of intercommunication by railway and the press. It is not surprising to find sometimes a rather unmeaning use made of features in stone districts which have taken their rise in the South; windows constructed in close imitation of those found in brick and timber localities, and chimneys designed with forms only suited for brickwork. On the other hand, in the southern districts, where building stone is scarce, imitation has done a great deal to adopt forms which can only be suitably used in a stone country. Stucco-work has largely favoured the imitation of features which can only be justifiably introduced in localities where stone of large dimensions is to be found to hand; but it is a plastic material—a kind of cast work, that hardly justifies the name of architecture.

There are also differences in the treatment of Classic buildings discernible by anyone who has studied the great towns of the North and the South. Take, for instance, Edinburgh or Glasgow, and compare its buildings with those of London. Geological conditions have impressed themselves upon the style. Large blocks of sandstone and granite take the place of the thin veneering of ashlar we find in London and the South; and these blocks of material form a part of the solidity of the walls, and do not merely mask a wall of brickwork behind. The stones go through, and form the plinths, jambs, and lintels of the façades, naturally imparting to them a thoroughness and massiveness of character we do not find in façades which are merely faced with stone. This is especially evident if we look at the buildings erected in Glasgow and other towns, and examine the reveals of the openings, where the difference of treatment may be at once observed. The sandstones, such as Giffneuk, Humbie, the grits, the Bramley Fall stone, used in large blocks, and the several kinds of sandstone found in Yorkshire, favour the solid modes of construction which the Classic style expresses; and we cannot wonder that these forms of architecture have found intelligent admirers and sympathisers in the North. The very hardness, stratification, and cleavage of the stones seem to suggest the horizontal lines of the Classic models in preference to Gothic or Renaissance; the size of the stones procurable also lend a massive homogeneous and monolithic character to the structures, and favour the development of those sterner and severer types of Classic expression into which the late Alexander Thomson so ably succeeded in imparting a freshness and spirit of his own. It is impossible to deny also that a stone locality eminently favours those qualities most conducive to good Classic work. The designer can make his basements solid, his columns large and dignified, his entablatures bold and massive; they can be made to project and be cut, if necessary, out of solid blocks of Craigleith, Penrith, or Dunmore; he feels that he is not stinted to thin quoins, and a breadth of handling soon characterises his work. It is impossible for a designer accustomed to the brick architecture of the South and to the cutting-down practices resorted to in the use of stone in façades in London, to work with the same freedom as the architect who can use solid stone in his work. The exigencies of the mason's work is constantly before him, and any projecting masses of stone have to be cut down to meet the bill of quantities, or schemed rather ingeniously round a core of brickwork to which they are attached.

It is next to impossible to expect good masonry under such conditions; and the ordinary London architectural decorations in stonework more frequently weaken the work than add to its durability. Much of the ashlar work in London is a mere skin of stone four to five inches thick, held on to the walls by bonding-stones at rare intervals. Good architecture is impossible under such conditions. With the exception of a few great public buildings, designed and erected in a spirit of liberal thoroughness, under circumstances which forbade the employment of flimsy materials, London is not rich in examples of the more solid types of Classic design. St. Paul's, and some of Wren's churches, the Royal Exchange, the Bank, the Post Office, National Gallery, London and Waterloo Bridges, a few of the club-houses in Pall Mall, and about a dozen other buildings devoted to civic and public uses in the City, are the only monumental edifices in which the material has not been begrudged in the conception. And this question of solidity lies at the very root of good architecture of the Classic styles. We can only attain to a superficial semblance when we imitate the columnar orders and features in brick, or face with stone. Mr. Gibson's new bank in Fleet-street, the Bow-street police-courts, and the Liberal Club, by Mr. Grayson, in Walbrook, are, perhaps, as successful in their way as any recent buildings of this class, and yet we feel that in the columnar façades of those buildings a great deal of costly material has been expended (not ineffectually) in the perfection of one front, for the sake of assuming a dignified exterior. The same expenditure might have produced a whole building of more thoroughness in brick and terra-cotta, and this thought rather tends to take away the satisfaction and pleasure with which we might otherwise view these attempts to reproduce grand Classic façades in London. Where the material of the locality is stone, and there is plenty of it to be got, there is wanting that painful evidence of great cost bestowed on one front. The Royal Institute of Edinburgh, with its massive Greek Doric porticoes and side colonnades, or the High School, are instances of thorough monumental effects, obtained legitimately with native material; their massive treatments we feel to be the natural outcome of a city of granite. Turning to Glasgow, this thoroughness in the buildings is equally evident, though they are of a different order from those of "Modern Athens." In Buchanan-street, itself a fine promenade, we need only allude to the Western Club-house, a stately Italian building; among others, to the Commercial Bank of Scotland, in Gordon-street, a structure based upon the Farnese Palace; the new Clydesdale Bank, by Mr. J. Burnet; and the recent offices of the Amicable Life Assurance, by Messrs. Campbell, Douglas, and Sellars. The Greek Church in St. Vincent-street, of the United Presbyterians, is a splendid example of the genius of the late Mr. Thomson, and its hilly site gives a dignity and meaning to the severe and grand, yet pleasing, outlines of the portico and tower. In this example, the fine sandstone of the locality is massively used, and the architect has wisely made the most of it, by adopting a severe trabeate form of structure, as solid in the flank and rear as it is in front. The Ionic portico rests upon a solid basement of the material, and the detail and outline are as characteristic of the hard stone employed as they are masterly and refined. The Institute and Galleries of Art, Sauchiehall-street, by the same architect, is another grandly-treated composition of considerable breadth, and of a monumental character. Instead of windows, its front is a plain surface of sandstone, relieved by sculptured friezes in the upper story, and by a dignified columnar entrance; the detail is semi-Greek in feeling, and thoroughly imbued with the true Classic spirit when left untrammelled. The Royal Exchange, the Union Bank, and other buildings may be cited to show what an abundant supply of good sandstone has done for Glasgow, in imparting a solidity and meaning to the Classic edifices with which it abounds. On this account, we hope the new Municipal Buildings will be equal to the site and the occasion, and that a dignified scale be given to the main façades. It would be an irretrievable mistake to select a design in which the parts or ordinances are small or repeated; for this reason we should prefer a single order of columns to a superposition of several, and a breadth of treatment in the main fronts and basements. The subject is a large one, and the question of material suggests the particular kind of Classic or Italian design suitable.

From what we have said it may be inferred that architects in London would wisely consult their art by adopting the more flexible forms of the style, examples of which are furnished by the Renaissance in abundance. The Queen Anne is one manifestation of the style, and its strong point is that it is a brick style, very free, and may be advantageously used for house building; but it is certainly not the style suitable for any great public or monumental purpose. Other and purer types of Classic admixtures abound in which brick and terra-cotta might play the *rôle* of stone, and it is this destiny which awaits the architecture of the future in this country.

FALL OF A HOUSE IN OXFORD-STREET.

THE fall of a house last Friday morning in Oxford-street serves rather as an incentive to increased watchfulness and care in building operations than as indicating a risk to be wholly avoided. That the utmost vigilance is sometimes of no avail to avert an accident we have had painful experience of late in connection with railway casualties, and so long as buildings are pulled down in old streets, there will be, in spite of Building Acts, and Dangerous Structures clauses, a liability to unforeseen dangers. The particulars of the accident in Oxford-street already published in the daily papers, give little satisfactory evidence of the real state of the case. It appears that the Princess's Theatre in Oxford-street is being rebuilt, and that for the purpose of widening the entrance from that thoroughfare, the house on the east side of the old entrance was purchased and pulled down. Soon afterwards, the next house to the eastwards, No. 72, in the occupation of Messrs. Cooke and Burchett, jewellers, exhibited symptoms of weakness, and on the evening previous to the fall, signs of the approaching failure were heard, and the assistants left in charge felt it necessary to make arrangements during the night so that they should not be overtaken by what they rightly conjectured as an impending danger. About four o'clock, those who were watching roused the others, as the signs of collapse became more threatening, and the assistants retreated by a side-door just in time to save themselves. It is not difficult to conjecture the cause of the fall. The house that had been pulled down had evidently been the main prop and support of the building, and notwithstanding that raking shores and struts had been put up, the house fell in from inherent rottenness of the side wall, which had been temporarily shored. We have had occasion before to speak of some of the sources of danger to which all old premises are exposed. The present instance rather points to a source of weakness which lateral shoring is almost powerless to prevent, but which, by reason of alteration or removal of adjacent premises often exists. It is pretty evident that many of the old street houses are literally hung up, so to speak, and receive as much vertical as lateral support from the adjacent premises. In the case mentioned, we understand upon good authority, that the wall between the houses was perfectly rotten, that openings existed in it which had been filled up in a careless manner with rubble, and that the bond was completely destroyed. Before the fall, a large mass of rubble fell out between the ground and first-floor levels, and the foundation of the wall had apparently become much impaired. In short, from the facts we have been able to gather, the lower part of the wall was quite unable to sustain the building, and its fall proves that it was a vertical subsidence which the cross struts above and the raking shores were useless to arrest; the wall, in fact, collapsed below, and the shores and struts fell with it. As long as the adjoining house stood, the wall clung to it, and the bond was sufficient to keep the wall up; but directly the other house was taken down it lost the support derived from the partial bonding and adhesion. The operations of shoring tended perhaps to shake the wall. From what we hear blame cannot be attached to any one, and the shoring appears to have been sufficient for the purpose. Besides raking shores against the house at the front and back corners, there were two tiers of cross struts, three deep, between the upper walls of the adjoining premises, so that it is clear there could have been no possibility of the house giving way laterally if the wall and foundations had been sound. Nor do we find that any operations in any manner affecting the footings of the fallen house had been made by the workmen employed by the contractor, Mr. Manley, who is engaged in carrying out the rebuilding of the Princess's Theatre under the supervision of Mr. Phipps. From our inspection of the premises to the eastward of the fallen house, it is clear that they too have been jeopardised by the fall, as the window-openings show a settlement, and the surveyor of the district has, we believe, condemned the house immediately adjoining the wrecked one.

This case adds another to the list of accidents due to worn-out party walls we have lately had to chronicle, and we may inquire whether the law is not rather imperfect in its operation. We have been told by a good authority that in some parts of London there is scarcely a sound party-wall in a whole street, and our own observations have quite convinced us of the truth of the observation. In the recent instance in Tottenham-court-road the party-wall was in a rotten state; but it had been improperly tampered with below, and we might point to innumerable instances where party-walls are found riddled with old openings, and which are scarcely in a fit state to touch, but which, notwithstanding, undergo hacking about. There is a natural reluctance on the part of adjoining owners to have their party-walls removed and rebuilt when old buildings are taken down, as the proceeding entails considerable inconvenience and loss of business in many cases; but it is clearly a duty the Metropolitan Board of Works owes to the public safety to see that these walls are in a fit state to remain. Some time ago we recorded the decision of a Metropolitan magistrate in a well-known case that has acquired an almost historic interest in connection with dangerous structures, where a wall, though insecure, was pronounced to be safe from falling by shores. But there are numerous instances, and the Oxford-street case furnishes a useful proof, that shores do not always render buildings safe. In nine cases out of ten, it will be found that the rotten part of a party-wall—often caused by openings made, and filled loosely up in the lower part of the wall—is beyond the reach of shores. Unless such walls are closely examined at the bottom, it seems almost a farce to introduce them. The clauses in the Metropolitan Building Act relating to insecure walls, are limited to part II. of the Act, and, unfortunately, the working of the law is not at present very satisfactory. Directly a house is pulled down there should be an official inspection made of the adjacent party-walls; now the clauses of the Act are not put into operation till after the Board of Works have been informed of the danger of the structure, which may be too late for any useful precautions to be taken. The Board, by Clause 72, has power, on the certificate of the district surveyor, to cause the building to be "shored up and otherwise secured;" but this operation may be really inadequate to meet the emergency: the shoring might rather facilitate than prevent the fall, and there is no guarantee that the proper means of security has been carried out. Temporary shoring, however inadequate, is a compliance with the law, and no doubt saves hundreds of houses from falling; but we contend that the meaning of the Act is not fully carried out till the wall has been repaired or secured to the satisfaction of the surveyor, till every source of weakness has been discovered, and means taken to prevent danger. Unfortunately, all the recent instances of accidents of this kind have arisen during the temporary shoring of the premises, or during the operations of pulling down and rebuilding of the adjoining premises, and there seems to be no guarantee given to an adjoining neighbour that when the next-door house is being taken down or has been removed, he may rest assured of the safety of his own, without fear of impending destruction to his life and property. Surely, if the rights of citizens are to be protected, the security of one's house might be readily provided for by the law, without entailing more cost or inconvenience upon the building or adjoining owner than the occasion demands.

MODERN CONCRETE.

THE name concrete has been long and beneficially associated with the Roman works in this and other countries, so much so, indeed, as to claim for the products of the old builder properties and excellences which modern experience has to some extent modified. There can, however, be no doubt that the care bestowed in concrete making by the Romans has bequeathed to us examples of this mode of construction worthy of imitation. It was for a long time imagined that the more durable remains of such ruins as are now capable of profitable examination owed their stability to a peculiar treatment of the mortar used in their construction. That this ingredient of the concrete was used in a hot liquid state came to be recognised as one of the canons controlling the production of Roman concrete, and even to this day we hear some writers bewailing the loss of the "Roman art" of both concrete and mortar making. The Roman builders were not always lucky in building imperishable structures, for the climate of their location had, as now, a marked influence on their longevity. Roman buildings in the Nile Delta have disappeared, while the Egyptian monuments built many centuries earlier still defy the destroying agencies of climate. But in a more northerly situation, Roman buildings continue to exist after the climatic destruction of the buildings of our own feudal period.

It may be said with all reverence that a too rigid or literal adherence to Roman examples of concrete is calculated to mislead, for the aids and circumstances which called forth and controlled these ancient structures are not forthcoming at the present time. The main factor undoubtedly in the production of the good examples of ancient concrete, was time, which in modern works cannot be realised until long after those who reared the structure have passed away. The concrete works of the Roman builders was limited to structural efforts only, for their roadways were built of substantial blocks, whether obtained from the lava deposits on the shores of the Mediterranean, or from those of Andernach on the Rhine. For road purposes, however, the modern engineer employs a variety of materials and means, and concrete-forming has now become a most important ingredient in the best laid streets.

The simple concrete of the ancients, however, admits of but little difficulty of examination compared with the many varieties of the present day, a short account of which we will now endeavour to give in the following remarks:—The subject is now becoming a most important one, not only from the improved character of the cementing or binding agents, but also from a more sensible knowledge of the materials to be bound, thus resulting in a much bolder use of the compound itself. The difficulty, however, has always appeared to us of really understanding what concrete is, and what are the best rules for observance in its production. If we examine any amount of engineers' or architects' specifications guiding the preparation of concrete, we become puzzled at the routine character of the prescriptions, and the utter want of technical rules or instructions. So much lime or cement, as the case may be, added to a certain proportion of sand, gravel, stones, or anything else, is about all the amount of information derivable from such sources, and if we look around us and endeavour to get instruction from an examination of concrete works in progress, we are equally, if not more unfortunate, in obtaining reliable information. If we cannot find quality of concrete, we certainly have no reason to complain of the quantity and varieties patent to the most casual observer in and around London. We will endeavour to give the subject a little coherency by an enumeration of the various concretes now in common use in the metropolis, and for their more profitable study divide them into something like a tangible category: 1st, structural; 2nd, substructural; and 3rd, semi-substructural. Of the first we may render it into many classes, such as concrete used in walls either in a monolithic or block form, of which there are an unlimited number of varied degrees and quality. Of the second, we may define it as concrete used in foundations of buildings for the purpose of resisting the vertical thrust of the superincumbent structure, or preventing the rise of damp in the lower walls. Of the third, we may say that under its head can be classed the numerous concretes used as foundations for pavements and roadways, which would include the advanced form of concrete used as paving for footpaths. Let us first examine No. 1 division, and see what comfort or information we can reach through its agency. The purposes for which this class of concrete is generally used ought to secure the best results, and no doubt should exist as to its capacity to resist the damaging influences which, from its circumstances and position, it is liable to. The oldest examples of this more recent or modern class of concrete in the block form is to be found at the College of Surgeons in Lincoln's Inn-fields, built when the knowledge of Portland cement was in a very confused and unsatisfactory state. The cementing agent used was in this case grey lime, in the slaking of which hot water was used. The result, considering all the circumstances of its surroundings, may be regarded as a successful one, and certainly for the time of its execution, a remarkable and creditable one. The merest tyro would not, in these times, resort to such a plan, however, for building a house unless he was beyond the influence and supply of Portland cement. Considerable progress has been made in the retaining-wall direction of railways, and Portland cement concrete has been used with much advantage in some of the Metropolitan railway works. During the last ten years many houses have been built with frames, and the advancing or increasing demand for buildings of this class indicates that the comforts and conveniences which the quality and character of a well-built concrete house secure is becoming appreciated. The concrete used for this purpose may be regarded as good in quality from the unavoidable necessity of being compelled to use for such a purpose cement and aggregate of the best kinds. We may look forward to a great increase in the quantity of work to be done in houses of concrete, both on the monolithic and block plans, while its free use in the construction of floors and roofs, in conjunction with iron, opens a wide and important field to the architect especially.

The substructural concrete is not of a high class character, and lime of the hydraulic type is most frequently used for such purposes in conjunction with river and pit gravels or sand. The quantity used in the foundations of say one of our modern city warehouses or offices is considerable, and it is almost surprising to see with what rapidity it is concocted and consigned to its resting-place. Where in such deep foundations water from springs or river sources does not preclude the use of lime, a tolerably good and sound foundation is thus obtained; but it is a question whether lime concrete, even in its best form, is cheapest, and we are certain it is not the best. Recently, the relative values of lime and cement concretes have been put to a satisfactory test in the works connected with the extensive dock operations at Chatham. The original contract was let under a specification which required the concrete to be of lias lime, and in the proportions of 1 part of blue lias lime to 6 parts of river ballast. During the early progress of these important works, however, it was found that the concrete so compounded "did not always set well under water," and it was resolved to substitute for it Portland cement concrete. The contract was not to be disturbed under the new arrangement, and therefore, the contractor was to supply a Portland cement concrete which would not cost more than that which was to be paid for the lime concrete. The concrete, therefore, had to be fined down in strength, and 1 of Portland cement to 12 of river ballast was used, much to the comfort of the engineer and all others concerned in the dock works. Of course, the values of the two concretes would fluctuate occasionally from the changing character of the cost of the lime and cement, but these works of undoubted excellence prove how much even a poor Portland cement concrete is superior to a comparatively fat lime one, and it is fortunate that the problem was thus solved under such favourable conditions and guidance.

Concretes of a semi-substructural character are unhappily of too great and fluctuating variety for us to derive much, if any, amount of comfort from their study. They exert, however, so considerable an amount of influence for good or evil to the community at large as to warrant us in giving a somewhat lengthened description of their kinds and varieties. They are of such a character, also, from their position being in public places, as to enable us with considerable advantage to point out their merits and demerits from a sensible or common-sense concrete point of view. We will, for the purpose of more clear description, resort to an increased classification in something like the following heads, viz.:—

1st, Metropolitan Board concretes.
2nd, City of London ,,
3rd, Vestry Board ,,
4th, Tramway ,,

Of the first we cannot speak too highly, for it has always been made of the best materials which engineering skill could select, and their careful examination and test before being used, secured that both cement and aggregate were unexceptionable. We have only to examine specimens of this concrete to feel assured that it is of a high character, and continues to improve in quality, a property inherent in all good and well-balanced cements. When "The Board" had completed their first new street (Southwark), and a few days after its dedication to public use, the gas and water companies (after having refused to use the convenient subway specially designed and built, at great cost, to receive their pipes) entered upon the work of demolition, they, happily, met with a state of things for which, from their past experience, they were quite unprepared. The ordinary "pick" of the stalwart navvy was of little use in penetrating the concrete under the granite paving "setts," and they had to employ steel tools of the best quality to get trench room enough to lay their pipes in. A good example of this concrete might have been seen when the excavation was made on the Victoria Embankment, wherein to place the "Cleopatra Needle." Such concrete was purposely intended to stand, and all the conditions necessary to secure that desirable end were forthcoming in its preparation and deposition.

The second, or City of London concrete, is perhaps most familiar to the City pedestrian whose walks range from Temple Bar to Aldgate, for the streets are, unfortunately frequently "up," either to put down some new paving or to repair the old. The modern asphalte covering to many of the City streets involved the use of a good and substantial foundation on which it could securely rest, for the bituminous compound had no inherent quality of rigididity, or, rather, not enough to withstand the damaging influences of a traffic such as that of London. There are a great many examples of concretes under both wood and asphalte, and a careful examination of their composition will show that both wood-paviors and asphalte layers appreciate the importance of supporting their several coverings on good and substantial beds. Portland cement is more generally used for City street purposes, and when mixed with good and suitable river ballast, the concrete for such work may be regarded as of undoubtedly excellent quality. We are occasionally charmed with a look at this quality of concrete when some gas or water communication has to be made, and we rather delight in seeing the very hard work the labourers have to get room enough to lay their pipes.

No. 3, or Vestry Board concrete, is, unhappily, not very much worthy of any lengthened description, except that it may be profitable to describe its general shortcomings and imperfections. Vestrydom does not yet seem to have profited much by its association with "The Metropolitan Board" in the cement direction, for the vestry concrete of to-day is much like what it was half-a-century ago — lime and river ballast, the former sometimes in lump and sometimes ground, according to the caprice and whim of the controlling authority; proportions specified are somewhat disproportionate, but generally too much lime is used, or at least, is supposed to be used. In old foundations of the paving we fail to see any good examples of concrete, probably owing to the unfavourable conditions which surrounded its original deposition. Before lime concrete in such situations could possibly have become indurated, or even before any beneficial effort of setting had taken place, the work of the paviour in ramming home the "setts" or cubes destroyed any chance of its ever becoming hard. We are glad to see that a little more sensible attention is given even to vestry concretes, and we still hope that our associated governors in the various metropolitan parishes will awaken to the importance of having a good base on which to rest their costly granite paving. Liverpool has, perhaps, next to "The Metropolitan Board," given good heed to the concrete question; and the authorities of that city not only provide for the best materials, but secure their use by buying and mixing them under their own supervision. The concrete at Liverpool is sent out ready mixed (water and all) in the corporation carts, and, in addition to this wholesome precaution, the concrete is not allowed to be covered by the paving setts until it is at least a fortnight old.

The 4th division of our sub-classification, or Tramway concrete, is, perhaps, the lowest in quality which we have referred to. The best or most suitable cementing agent is not generally used, and the aggregate with which it is mixed is a doubtful compound of the dirty "macadam" or other objectionable material excavated from the ground on which the tram is laid. The enlightened engineers controlling this sort of work imagine we suppose that the weight of the tramway and the loaded carriages will keep the concrete so ingeniously laid quiet and comfortable in the future. We should have thought that the vestry or parish authorities had some power of controlment over such reprehensible doings. Tramways form part of our leading thoroughfares, and their state during wet weather, caused by the ruts of the tram rails, is simply disgraceful to all concerned. We would recommend a visit to Glasgow, to both tramway and vestry authorities, for in that city they would find a very different system from that prevailing in the midst of the great aggregation of London parishes.

In all these varieties of concrete, good, bad, and indifferent, which we have thus referred to, there are none what may be called produced on accurate technical lines. The best secure the most satisfactory results from the fact of great care being exercised in the selection of the materials, but all of them fail to realise the best products from an utter absence of careful admixture or manipulation of their several parts. The heaps of gravel covered by the fluctuating modicum of cement, or lime are under the best condition of general practice prevented from being brought into intimate enough contact from the unsatisfactory manner in which the water is applied. In some of the more advanced concrete works the materials are first mixed together in a dry state, when, under such circumstances, the water, however carelessly applied, fails to disturb the accurate relationship of the cement and aggregate. In large dock or harbour works, or other important examples of concrete making, the materials are mixed by machine, and thus all the concrete particles, with the smallest amount of moisture, are economically and successfully brought into the closest contact. Some engineers, such as the gentleman in charge of the Chatham Docks, prefer mixing the cement and ballast by hand twice in a dry state before applying the water; while the engineer conducting the operations at Dublin Harbour mixes his concrete in a simple machine before it passes into the moulds in which he fabricates his monster monoliths of 350 tons' weight.

Concrete is a suitable material with which to construct sewers; but a recent attempt in this direction has not proved satisfactory, for, before the sewer can be dedicated to its destined use, the concrete of which it is composed has been required to undergo a process of *waterproofing*, not only to fit it for the work it has to perform, but to prevent its absorbing the water of the brooks and wells in the land through which it passes. That concrete, so signally unsuitable, was made of good materials; but the guiding intelligence was absent, and, hence, the blundering and unsatisfactory results we have described. Such failures, however, will, in the end, lead to a better knowledge of the concrete question; for the financial loss which such a misapplication of men and means occasions will be a good lesson for engineers to read.

That the art of concrete-making is not lost, but rather gradually disentangling itself from the ignorant bonds with which it has been for so long a time fettered, is apparent from the satisfactory progress in the prosecution of scientific concrete-making, in the direction of silicated paving and pipes. In these now well-known industries all the required conditions of success are applied in producing a quality of concrete all but irreproachable in character and quality. Accuracy of quality in materials, and strict attention to their mixture and proportions, combined with the best means of rendering them homogeneous in texture, succeeds in producing a concrete of great density, having the capacity of withstanding frictional wear underfoot, and proof against the insidious action of abnormal atmospheres. It is fortunate for the future of concrete that the commercial success of these industries keeps before us the knowledge of what a good concrete should be, and we cannot do better, in conclusion, than direct attention to these modern high-class concretes as examples to study by all and sundry interested in this most important question.

Concrete may be made of anything: old plaster, rotten and foul brickbats, or worse, according to some would-be authorities; but when so made, there is no better value derived than what might be expected under such circumstances. The cementing agent, of whatever quality or kind, is simply thrown away in the futile attempt to render profitably coherent a mass of such unsuitable materials. We do not despond as to the concrete's future, while advancing science helps its progress on true lines; neither do we despair lest the art should die out while the miles of Victoria paving continue to resist the wear which a York landing or flag succumbs to.

ORIGINAL SKETCHES FOR ART FURNITURE.*

WE have received the second edition of "Original Sketches for Art Furniture" by A. Jonquet, a work which we noticed about a year ago, published by Mr. B. T. Batsford, of High Holborn. For many of the plates of designs in the first edition have been substituted others, and upwards of twenty new plates have been added in all, making a slight addition to the present volume. The styles selected are those which still command the appreciation of purchasers and others of taste and judgment, and the author has taken care to avoid the extremes of fashion. The designs are printed in brown ink in a rather sketchy style. Sideboards, chimney-pieces, bookcases, cabinets, and overmantels occupy a large space, and many of these designs indicate a quiet and sensible mode of ornamentation, though it would be needless to say we cannot admire them in all cases. Plate 2, a chimney-piece with over-mantel in a kind of Jacobean style, is a trifle over-done in the panels, if we are right in supposing them carvings; perhaps painted china is intended, in which case the same objection would apply. We do not like the long bracket over the mantel, where a mirror would be more usefully placed, and the small side brackets on the jambs look meaningless if not rather in the way. Plate 3, a fireplace, treated in a mixed or 18th-century style, is better, except the bracket below the mirror, which leaves a rather meaningless space between it and the mantelshelf. The design at the bottom of plate 4 is unpleasing. Why break up the space for decoration by a flat arch? It is a distracting element in the design. The panels are intended to be decorated with Wedgwood. We like the upper design the best, and one on the following page conceived in a sensible Adams style, though a close imitation. In fact, whenever the artist seeks to introduce an innovation in this style he is on dangerous ground, for it is not one which can be handled with any freedom. The buffet in Queen Anne style, plate 6, is a common-sense piece of furniture, though the line-drawing hardly shows it to advantage. Plate 7 is also simple and unpretending, but the design on plate 8 a little broken and incoherent at the top, and the pediment sprawling. Quiet in treatment are the designs on plates 9, 10, and 11. The last is simple and effective, and would make a useful sideboard for a dining-room of moderate size. The cove and panelling at the top in the sideboard, plate 12, are disproportionate and heavy: the upper part on the following plate is better. Dinner-waggons should be simply framed, and the ornamentation limited to outline and moulded work. The designs shown for this class of furniture are unique; we particularly note one of very simple construction on plate 16 finished at the top with a broken pediment, but without surface enrichment. Chairs are illustrated by several sketches in the Adams and Jacobean styles, but the drawings do scant justice to some of them. Good chair and sofa design is not often met with, and perhaps with the whims of buyers and the interests and crotchets of upholsterers, it is really difficult for an artist to design anything of merit. A few of those shown exhibit marked improvement upon the ordinary ugly shapes seen in the bazaars. The chairs on plate 42, in a plain Adams style, are neat; others in a freer style (plates 38 and 39) have backs rather too elaborated to be distinguished for comfortable sitting, and the lounges and couches are all in the newer styles. Those seeking new designs for furniture will find ample materials in Mr. Jonquet's book in every style. Of course it is impossible to avoid commonplace in works of this kind, and a few of the sketches are chargeable with the repetition of some of the more objectionable features and tawdry ornamentation of the ages sought to be reproduced. Those who like plenty of glass will admire the over-mantels, pages 29 and 32; the admirer of natural ornament will not object to the sprays introduced in small panels and coves, and the connoisseur in French elegancies and refined decoration will find his taste suited on pages 26, 28, 35, 36, and the plates at the latter part of the book where designs will be found for a variety of furniture of the Chippendale, Sheraton, and Hepplewhite periods. The small and light tables for cards and coffee, composed of turned moulded rails on plate 44, the table and chairs, plate 48, and the bed-room furniture in the Chippendale style, plates 50 to 62, are all designed with reference to the requirements of modern house-furnishing and taste, and the inclination of the most fastidious purchaser cannot fail to find something that will suit in the large collection of sketch designs brought together. The sketches would have been more useful if plans had in some cases been added, and a few pages of description would have enhanced Mr. Jonquet's useful book of designs.

SANITARY SCIENCE IN AMERICA.

IN the United States the sanitary construction of houses is beginning to be made a special subject of inquiry and investigation, and Mr. Edwin Chadwick, in a paper contributed to the *Journal* of the Society of Arts, throws a little light upon the errors committed in Boston and other towns in the United States. A report recently made to the Massachusetts State Board of Health, by Mr. Elliot G. Clarke, assistant engineer of sewerage works at Boston, clearly shows that the old mistakes in the construction of sewers and drains under which we so long suffered have been revealed in the States. In the woodcuts accompanying the report we find sections of conduits discovered in Boston which, in all respects, resemble those which long disgraced the sewerage system of London and other towns. The writer instances the non-existence of drains, as where a drain-pipe from a dwelling ran through the walls and there ended, and where a block of six expensive houses, occupied for months, with all the usual paraphernalia of plumbery and waste-pipes, had no drains beyond the walls. We have heard of such cases in London, and it is a clear justification of the old adage, that what is everybody's business is nobody's. One engraving tells its own tale rather amusingly. It shows a house-drain stopping against a log of wood which the drainlayer had mistaken (?) for the sewer. The log was chopped and found to be hollow, and the drain was connected to it. Drains of various sizes were found, a few of 4in. diameter, but the largest number from 8 to 12in. diameter. Many that have been met with in forming new sewers are square in section, made of plank. With respect to size, the author of the paper alludes to the different opinions on large drains, and he says truly that in building a drain the object should be to prevent the beginning of a deposit, one much easier to accomplish in a small than a large drain. Three-quarters of the house-drains of Boston are said to be too large, and the forms illustrated represent a variety of brick and timber conduits, from a plain square section, made with a stone bottom and top and brick sides, to the ordinary barrel, oval, and angular sewer of brick. Half-cylinders, with the bottom made of flat stone, and another showing the same reversed, are among the kinds of construction. It is curious to find that even in America the first constructors of sewers adopted the flat bottom, without thinking of the result of spreading out the water into a thin sluggish stream, which filled the angles with solid matters, and never had sufficient depth to remove solid obstacles. The result of this mode of building is strikingly explained in the sequel. Out of 113 house-drains, 45 had flat bottoms, and of these 26 were choked with sludge, while of the remaining 68 with round inverts, only 12 were choked, and 56 reasonably clean.

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* Original Sketches for Art Furniture in the Jacobean, Queen Anne, Adams, and other Styles. By A. Jonquet Second Edition. London: B. T. Batsford, 52, High Holborn, W.C.

A useful hint on brick-constructed sewers is worth noticing here—namely, the desirability of leaving the lower half of a brick drain free from mortar droppings. After the supporting centres are removed, portions of the mortar fall and adhere to the bottom, and cause obstructions to the flow of sewage. In many drains of brick the mortar is found left projecting into the drain from the joints; these should be carefully struck in the lower half. In pipe-drains the mortar used to unite the sections often exudes into the interior, forming a series of little dams; and it is necessary to clean the interior of each pipe with a hoe. With respect to inclination of house-drains, less than half an inch to the foot is not considered safe, though many instances of level drains are recorded at Boston, and some pitched the wrong way. Tight drains are strongly insisted upon, and the author mentions that 55 per cent. of house-drains in Boston were defective from not being tight. The settling of the ground below drain-pipes, and the consequent fracture and leakage at the joints, is a prolific source of mischief not always to be avoided by careful laying and jointing; and, as Mr. Theodore Clark observes, even where drains have been laid with the greatest care, water will often in course of time make its way out around the joints between the pipe and the ring of cement. The cement may have taken a perfect mould of the pipe, but, either from some greasiness or dust on the pipe at the time of laying, it has failed to adhere, and water has ultimately forced its way through. Mr. T. Clark remarks that defects are more common from this cause than leaks in soil-pipes, imperfect traps, &c., and he advises that the earthenware drain-pipes should be first examined in searching for the cause of unpleasant smells in any part of the house. Cases are even mentioned where leaks in the drain have directly communicated with the cold air supply-pipes of the warming apparatus, and by this means the gas has been distributed. A common place for a leak to occur is the point where the pipe-drain passes through the wall of house into made ground, which of course settles, and cracks or dislocates the pipe, causing leakage into the cellar and foundation walls. The superintendent of the Boston sewers says the number of drains leaking under houses and into foundations is very large, and the same might be said in London and other towns.

ANCIENT LIGHTS.—I.

THE law as to ancient lights is so burdened with legal learning, and so complicated by conflicting decisions that it is difficult to give a brief sketch of its present position. Still, much can be done to aid men of business in judging of these matters by setting forth a few of its plainest principles, and pointing out how they are applied to practical purposes in our courts of law and equity. But, in the first place, it is well to understand what we mean by ancient lights, and to grasp the idea upon which the right to the free access of light and air by certain windows is really founded. Any man may build as and where he likes upon his own land; but so also may any other man. If, therefore, he chooses to build a house at the edge of his own property, then also may the other do likewise and block up his windows. The right to light and air is a natural right, and thus we see that the right to the admission of light and air through specific windows can only arise when, by some means or another, a similar and equal right has been lost by the owner of the adjoining property, for the right itself means nothing more nor less than the power of preventing someone else from doing as he likes upon his own land. In law, therefore, this right is spoken of as an easement, which is defined to be "a privilege without profit, which the owner of one neighbouring tenement hath of another, existing in respect of their several tenements, by which the servient owner is obliged to suffer, or not to do, something in his own land for the benefit of the dominant owner." That definition cannot be improved, and thus we see that to constitute the right there must be two tenements; one, the dominant, to which the right belongs; the other, the servient, upon which the obligation is imposed, if not interfering with the enjoyment of that right. Now, in the first place, it must clearly be understood that the law will have nothing to do with questions of prospect or privacy. It is true that property may be injured by the erection of a building which overlooks its gardens, and so ruins its former privacy, or still more, by the destruction of a pleasant prospect, as where, in one case, a hideous black gasometer shut out a lovely view. But there is no legal right of easement in such matters, and the Court cannot order damages or grant injunctions whenever they may happen, or however great may be the injury to property. These remedies are only applicable to the obstruction of ancient lights and other similar rights acquired by one man over the tenement of another.

This right to certain window lights may be acquired in three ways—by occupancy, by express agreement, and by implied agreement. Strictly speaking, the first of these is the only one coming within the meaning of ancient lights, but the others will be briefly considered. In early days, the right to window-lights by occupancy was founded on prescription, and followed upon proof that the lights in question had been enjoyed since the beginning of legal memory. This was a very vague rule, and got worse as time went on, so, in the Statute of Limitations of James I., it was practically enacted that twenty years' occupancy gave a title to ancient lights. But this was only presumptive evidence that might be upset by the finding of a jury, and it led to some strange results. In 1832, however, the Prescription Act (2 and 3 Will. IV., c. 71) was passed, by which twenty years' possession became of itself a title, without the need of any jury to make it so. This is done by the third section, which is so important that we cannot do better than quote it entirely. "When the access and use of light to and from any dwelling-house, workshop, or other building shall have been actually enjoyed therewith for the full period of twenty years without interruption, the right thereto shall be deemed absolute and indefeasible, any local usage to the contrary notwithstanding, unless it shall appear that the same was enjoyed by some consent or agreement expressly made or given for that purpose by deed or writing."

In the great case of "Tapling v. Jones" (34, *Law J.*, N.S. C.P., 342) in the House of Lords, the effect of this statute was considered, and it was decided that, by the Prescription Act, after twenty years' user of lights, the owner of them acquires an absolute and indefeasible right, which so far restricts the adjoining owner in the use of his own property, that he can do nothing upon his premises which may have the effect of interrupting them. In other words, a house having certain windows for over twenty years, acquires the right to use them as ancient lights, and becomes the dominant tenement, so that the owner of the servient tenement, over which the light passes to those windows, is under the obligation not to raise any obstruction upon his own property. But this result only follows upon the happening of certain conditions. First, the enjoyment mentioned in the statute must have been in the character of an easement; that is, that it must be distinct from the enjoyment of the land itself. If, for instance, a man occupy a house for over twenty years, and, at the same time, rent the adjoining garden, he will not have acquired a right to window lights over that garden when it passes into the possession of another, because the tenements have not been in that position of dominant and servient, out of which alone the right can spring. Secondly, the occupation will count for nothing if it has taken place under some deed or agreement *in writing*, as the statute provides; but a verbal consent will make no difference. In the third place the occupation must be, as the Act says, without interruption; but this interruption to stop the right must have lasted for one year after it came to the notice of the party claiming, and it must be an interruption in the nature of an adverse obstruction, and not merely a cessation by the dominant owner of the user of the ancient lights claimed. The last condition follows as a matter of course, and is that the twenty years relied upon must be the years next before the action being brought. For the rest, it is obvious that the right to window-light may be acquired, not only without the consent, but also without the knowledge of the servient owner, as in cases where the tenement is let, and more than twenty years pass away before it returns to the ground landlord or falls to the reversioner. The right to window-lights can also be acquired by express agreement, as where the owner of an adjoining piece of land covenants that he will not in any way obstruct the access of light and air to the windows of his neighbour's tenement; but the more usual form of covenant is that such an owner will not build above a certain height, which comes to the same thing. An implied agreement not to obstruct window-lights arises where a man sells a house, but keeps the surrounding land, and the sale of the house, as it stands, gives the purchaser a right to the lights coming in at the windows, over the vendor's land, without the necessity for proving a twenty years' possession.

The right to ancient lights does not mean in law, that the servient owner can be restrained from any and every obstruction. There must be such an interference with diminution of the light as trenches upon the comfort of its occupants, or as injures the premises for business purposes. A mere speculative exclusion of light will give no ground of action, and the plaintiff must prove that his light has been so far lessened as to lower the value of his property; for this is the legal standard of damage, and not the owner's personal comfort. After many conflicting cases upon the point, it seems to be now decided that the extent of the right to window-lights is the same—whether the tenement be in town or country; as, by the Prescription Act, all local customs have been abolished.

Another question of even greater importance is whether the right to light and air is limited to the extent required by the state of the tenement for the time being, or can be enlarged to an extent sufficient for purposes to which it may hereafter be applied.

Here, again, there is great conflict amongst the authorities. Some eminent judges have held that the possible future of premises cannot be taken into account, and that the only thing the law can restrain is an obstruction of the light as then being used. But later decisions, and especially that of "Yates *v.* Jack," in the House of Lords (L.R. 1, Ch. 295), rule otherwise. Lord Cranworth, holding in this case that, as the Prescription Act confers an absolute right in ancient lights, the defence could not succeed unless it were shown that there had been no interference with the plaintiff's light for whatever purpose it might by him be used. Nor can it be set up in answer to a claim to restrain from blocking-up the plaintiff's lights, that the obstruction leaves him as much light and air as other men in the same trade find sufficient; for that is by no means the question. Neither can it be said by the defendant that as the plaintiff has sometimes chosen to darken his own light by blinds or otherwise, therefore, an obstruction which does no more is illegal; for because he reduces his light as occasion may require, is no reason why it should be permanently lessened by another. Of the remedies for obstructing ancient lights, and of the defences that can be raised, we shall speak on another occasion.

THE UNHEALTHINESS OF PUBLIC INSTITUTIONS.*

In a paper read at the Sanitary Congress at Croydon last year, I drew attention to the sanitary defects which had been found to exist in some of the older public institutions in this country. Special reference was made to the Manchester Royal Infirmary, which had been reported by Mr. Netten Radcliffe, of the Local Government Board, to be unhealthy from cellar to garret. The defective health arrangements at the large lunatic asylums were referred to, and the condition of the County Asylum, at Frome, was selected as a typical example of the insanitary condition of the majority of such buildings. At neither Manchester nor Frome could reliable information as to the drainage arrangements of the buildings be obtained, and no proper plans could be found. It was further stated that investigation had brought to light the startling fact, that not 10, and possibly not 5 per cent. of all the hospitals throughout Great Britain and Ireland, possess any reliable plan of their drainage arrangements. Even some of the most important hospitals in the kingdom had no such plans, and it would be easy to give instance after instance of the culpable ignorance which prevailed on this important subject. Remembering the foregoing facts, I asked what is the probable condition of the drains of all institutions built some 50 years ago?

Last year I specially referred to old institutions as opposed to recent buildings. By a sublime act of faith I took it for granted that buildings erected within the last ten years would certainly not suffer either from insanitary construction or defective drainage. From the amount of attention which questions of hygiene have excited, and the numerous and competent authorities who have written and spoken on the subject in all its branches, it might at first sight have been taken for granted that architects of more or less eminence would have brought much intelligent study to the consideration of the right construction of drains and to that of sanitary arrangements generally. Unfortunately, experience proves the reverse to be the case, and if anything, the newer the building the worse probably is its sanitary condition. Is it not time that the Royal Institute of British Architects took up this question of sanitary construction, and that its council should make regulations for the guidance, instruction, and training of the rising generation of architects? Such a course will ultimately guarantee the public against the defective, unhealthy, and discreditable condition of many public and private buildings which have been erected under the supervision and from the plans of some of the most eminent men in the profession. It is quite certain that the Royal Institute of British Architects must declare, either that the profession repudiate all responsibility for insanitary defects in dwelling-houses and large public institutions, because hygienic arrangements are no part of an architect's business, or they must promptly offer adequate guarantees to the public which will protect it from the disastrous results which now too frequently follow the occupation of a newly-erected edifice. Suppose a wealthy client pays a large sum for the erection of a new house, which he has been assured by his architect is planned and arranged upon the most perfect system known to modern science. The professional adviser cannot expect that such a client, however much he may be reconciled to the anxieties and increasing expense of each addition to his family, will, without remonstrance, submit to an annual and increasing outlay for sanitary alterations and drainage improvements, rendered necessary by the carelessness or ignorance of the architect himself. It may be thought that new buildings are as a rule carefully erected, and that there is no justification for the foregoing remarks. Unfortunately for architect and client, such is not the case.

I hold myself responsible for the accuracy of the following descriptions of three new buildings, a hospital, a convalescent institution, and a lunatic-asylum, all of which have been built, opened, and occupied within the last seven years. All names are purposely withheld.

The Hospital had not been in occupation for more than 18 months, when the atmosphere of the building and the health of the inmates pointed to defective drainage and construction. An examination of all the drains, baths, and other conveniences, proved the sanitary condition of the building to be most unsatisfactory. It soon became evident that very considerable alterations were needed to remedy the defects. This new hospital had therefore to be closed within three years of the date on which it was opened. A thorough investigation brought to light the following facts:—The cisterns were placed so high that the pressure from the main was seldom or never sufficient to fill them. In consequence there was a gradual choking of the drains throughout the hospital, and an admission of sewer-gas to all parts of the building. No manholes or means of inspection were provided, and the plans of the drains were found to be unreliable. With four exceptions, the drains were laid outside the building, but the levels were very irregular. Thus: the level at the lower end of a drain was 1 in 60, higher up it was 1 in 24, and above this again 1 in 125. No wonder the drains were found to be choked. The pipes were also badly laid. In some places they were leaky, and very foul excrementitious matter was discovered in the soil near them. All pipes were pointed with clay, not embedded in cement, and few were water-tight. In fact, the defects were serious enough to guarantee the admission of sewer-gas to all parts of the building. The hospital drains were in direct communication with the town sewer. The rain-water pipes opened directly into the drains, they were untrapped, and as they were only carried to a level with the upper part of the windows of the top wards, they conducted volumes of gas from the sewer to the wards. The soil-pipes were all inside the building, and were trapped at the foot, and ventilated by smaller pipes carried up a certain height and then bent over. These traps were quite inaccessible, and the soil-pipes were not properly ventilated, as they were only open at the top, so that no current of air could pass through them. As there was no inlet at the ground-level, foul air was forced out through the lower closets into the hospital, whenever any considerable volume of water passed into the soil-pipe from the upper floors. The slop-sinks discharged into the soil-pipes, and were practically untrapped, so that by their means sewer-gas was laid on to every ward in the hospital. There were other defects, and no one will be suprised that the sufferings of the surgical patients and the general unhealthiness soon compelled the committee to close the hospital.

The Convalescent Institution stands in its own grounds of 8 acres. It is beautifully situated. It has extensive gardens and every convenience, not to say luxury, that modern taste could suggest. The cost of the site, buildings, &c., was upwards of £50,000, there is accommodation for some 200 patients, and it has been occupied for less than five years. Within a year of its being opened there was a sharp outbreak of erysipelas amongst the patients, and the institution was closed and fumigated. It was noticed at the time that all the conveniences opened into the building, directly opposite the wards, and a suspicion of defective drainage arose, but was not credited, owing to the fact that the building had been occupied for barely one year. A few months ago the unhealthiness of the institution was so marked, that the committee gave instructions for a complete examination of the drainage system. No plan of the drainage could be found, but one was ultimately furnished by the architect which proved to be incorrect in many particulars. All drain-pipes, &c., were found to be in and beneath the building. The baths, lavatories, and sinks opened directly into the sewer, and many were untrapped. In that portion of the building allotted to the officers, owing to an ingenious arrangement of the lavatories and the pipes connected with them, sewer gas was admitted at both ends of each floor. The ventilation of the drains and sewers was so defective, that during certain winds the sewer gas was driven through and into the building by means of the ventilators. Some of the drains were laid up-hill, all were pointed with clay, and not imbedded in cement, all leaked, and the main sewer, as it passed from the building, was laid at irregular levels, and in more than one place, owing to imperfect workmanship and improperly-made ground, the pipes of which it was composed were not in contact with one another. The main sewer had to be entirely relaid. All the drains were taken up, and, with the soil-pipes, were placed outside the building. It is not to be wondered at, in the face of the foregoing facts, that instead of being a convalescent institution, these defects of construction compelled the convalescents to return, not to their own homes, but to the hospitals from which they came; whilst the majority of the resident staff were placed on the sick-list. Yet the architect had, in this case, unlimited funds at his disposal, and the fullest liberty to do all that he thought necessary or desirable.

The County Lunatic Asylum has been opened for the reception of patients for five years. Built regardless of expense, it was supposed to contain all the most recent improvements in lunatic-hospital construction. Almost from the date of its occupation it has been the scene of outbreaks of dysentery and erysipelas. During the first eight months of 1879, cases of these diseases were of constant occurrence on both sides of the asylum. There were twelve fresh cases of dysentery and four of erysipelas every month. Suspicion having fallen on the state of the drains, ultimately a competent engineer was appointed to examine them. Numerous faulty points in the system were detected, and their rectification has been followed by the disappearance of dysentery and erysipelas from the establishment.

I have here given positive proof, from the experience of the past twelve months alone, that the architects who have been entrusted with the erection of these large public buildings devoted to medical purposes, have shown an ignorance, or, if you prefer it, a total disregard, of sanitary laws and requirements. I refrain from comment, but I appeal to the Royal Institute of British Architects to apply a remedy which will prevent like abuses for the future. If they fail to do this, then let them boldly hand over all matters affecting drainage and sanitary construction to the engineer. By this means they can readily avoid a heavy responsibility, and save their profession from much discredit.

It behoves the public to take the question up from a different point of view entirely. Private houses and public institutions are not free, as they ought to be free, from preventible impurities, and they are too often highly dangerous abodes for anyone who has a tendency to zymotic disease. No permanent prevention is likely to be secured without a thorough, an independent, and a periodical inspection of all the structural and drainage arrangements of these buildings. A central office for the safe custody and registration of the drainage and other plans of all public buildings, hospitals, and private houses is a much-needed reform. Competent inspectors and a central repository might be secured for a reasonable outlay, which would be over and over again repaid to those who were sensible enough to avail themselves of its facilities. At the present time no one seems to think of drainage arrangements. Nearly everyone is contented with a taking exterior. Yet the magnificent elevation of the block of new buildings known as the new Foreign Office did not protect its inmates from the inconvenience attending the presence of several inches of liquid sewage, which was found in the basement of the Home Office within a few weeks of its occupation. Could the Congress better employ its time, than in appointing an influential deputation to the Local Government Board, who would strongly recommend the adoption of the necessary remedies for the removal of the evils brought out by the facts detailed in the paper ?

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* A paper, by H. C. Burdett, read at the Sanitary Congress, Exeter, Wednesday, Sept. 22, 1880. (See p. 367.)

THE CHATHAM DOCKYARD EXTENSION WORKS.

TO the northward of the Royal Dockyard at Chatham lies what is generally known as St. Mary's Island, which was formerly separated from the mainland by a creek of considerable width and depth, opening at either end into the river Medway, which here makes a sharp curve. Taking advantage of the excavations already effected by nature, a series of basins for repairing and fitting out vessels belonging to the Royal Navy have been designed and partially constructed on the Island. These basins, which with their adjuncts are known as the Chatham Dockyard extension works, were on Tuesday visited by about 80 of the members and associates of the Society of Engineers. The visitors were received by Mr. Edwin A. Bernays, the superintendent civil engineer, who, with Mr. T. W. Newton, the executive officer in charge of the works, showed them over that portion of the dockyard extension in course of construction.

Although the undertaking is of but comparatively recent date, the necessity for these docks has long existed, and has as long been recognised. In 1850, the Admiralty purchased the land lying between the dockyard and St. Mary's Creek, and in 1854 they bought St. Mary's Island. In 1861 an Act was passed giving the necessary powers for carrying out the works proposed by the Government, according to the original designs of Colonel Greene, then Director of Works to the Admiralty. In 1864 the general design of the works was finally settled by Colonel (now Sir) Andrew Clarke, who succeeded Colonel Greene at the Admiralty, and the works were forthwith ordered to be carried out. They consist of three main basins, communicating with each other, together with four large graving docks. The first basin opens out of Upnor Reach, and is called the repairing basin. It has a mean length of 1,270ft., a width of 700ft., and an area of about 21 acres, and is mainly used for the reception of newly launched ships or of those stripped for repair after return from commission. At the eastern end of this basin is a passage opening into the second or factory basin, which is used for the reception of vessels while their engines and machinery are being fitted and placed on board, or are in course of removal. This basin has a mean length of 1,245ft., and a width of 700ft., with an area of 20 acres. This basin will open into the third or fitting-out basin, now in course of construction. It is of irregular shape, and will have an area of about 27 acres. Its breadth is the same as that of the other basins —viz., 700ft., and this dimension was fixed with regard to the advantageous working of the basins, the usefulness of a basin depending upon its available wharf accommodation, rather than upon its mere superficial area.

The repairing basin has but one entrance—that in Upnor Reach, which is closed by a caisson. The fitting-out basin, however, which opens into the river at Gillingham Reach, has two entrances. Each of these entrances forms a lock closed at both ends by a caisson, and of sufficient length to receive vessels of the greatest length in use in the Royal Navy. There will be arrangements for pumping out these locks, so as to allow the examination of a ship's bottom to be made if necessary. Provision is made for adjusting the level of the water between the river and the basins, docks, and locks, by means of large culverts closed by sluices, worked by hydraulic power. Opening from the repairing basin on the south side are situate the four graving docks, which are all of the uniform length of 469ft. 6in. Two of these docks are sufficiently wide to take any but the latest of our ironclads, while the other two will accommodate the *Inflexible*. The floor of each dock within the entrance is 41ft. below the coping level, rising 1ft. in the length of the floor. The docks can be emptied of their contained water down to low-water level in the river, below which point the water has to be removed by pumping. The pumps are driven by compound engines of 250-horse-power, and in the building containing the pumping machinery is the machinery for working by hydraulic power the capstans, sluices, &c., connected with the docks and basins. The cranes and sheers are worked by steam power. The sheers on the south side of the repairing basin are 140ft. in height, and will carry 100 tons. In the factory basin are sheers of similar construction, but of smaller power. As the machinery-shops in the existing dockyard are not adapted for the execution of a greatly increased quantity of work, and as they are, moreover, situate at an inconvenient distance from the new docks, one of the large iron slip roofs formerly standing in Woolwich Dockyard has been erected and fitted as a machinery-shop at the head of the two western graving docks, and will serve for the execution of repairs to iron ships in the docks. A similar shed has been erected at the head of the two eastern docks, and serves as a boilermakers' shop. There are, besides, several sheds and buildings for similar purposes at various points at the sides of the docks. In the fitting-out basin concrete has been extensively used throughout the whole of these works, and Mr. Bernays has largely availed himself of convict labour with satisfactory results. The men of course work in gangs, and different gangs engaged on similar classes of work vie with each other in its execution. From 10 to 15 per cent. of free labour is also employed upon the works, but this is of a higher class and is designed to keep a check upon the work performed by the convicts. The concrete walls of the fitting-out basin are about 20ft. wide at the base and are gradually reduced, by being stepped, to 8ft. at the top. Their construction, however is slightly modified at various points to suit special requirements. These walls have been completed, and the chief scene of operations at present is the two entrance locks. Of these, the north lock is all but completed, while the south lock approaches completion. The concrete foundations for the engines and machinery here are also well advanced, and it is expected that the works will be completed and the basin ready for occupation by the end of next year.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

MR. GEORGE CORSON, of Leeds, has addressed a letter to the Lord Provost and Town Council of Glasgow, in which he defends his estimate of cost against Mr. Barry's, and describes the municipal buildings he is now erecting for the Leeds Corporation, in very similar style (Palladian) to his design which received the first premium at Glasgow; these cost 10d. per foot, although the stone used is at least 40 per cent. more expensive than that employed in Glasgow. To this price per cube foot he added, in his competition estimate, 20 per cent., although Glasgow prices are slightly lower than those of Leeds. He therefore submits that he has fulfilled the conditions of the competition, and that it would be unfair to select for execution, in preference to his, any of the designs that have broken the condition as to cost.

Mr. Edward Clarke has addressed the following letter to the Lord Provost and Corporation of Glasgow :—

"6, Adam-street, Adelphi, London, W.C., September 15th, 1880.—To the Lord Provost and the Corporation of the City of Glasgow.—Gentlemen.—As the author of design 'Let Glasgow Flourish for Ever,' placed third of the premiated designs by Mr. Barry, permit me to refer you to Clauses 7 and 8 of the printed conditions issued to competitors, which make it imperative—(1) 'That all drawings must be made to a scale of one inch in ten feet, and be made on sheets of plain paper, and mounted on plain stretchers without frames or borders.' (2) 'The elevations are to be shown in geometrical form only, in line, without colour or etching. No drawings in perspective will be received.' With regard to the above clauses, both 'Carton' and 'Fidelity,' in violation of the condition No. 7, have mounted their plans on coloured borders ; and with regard to condition No. 8, have both etched and coloured in their drawings, and consequently obtain a very great effect, and render them not line drawings, but drawings shaded and coloured. I have, therefore, to inquire whether, in your opinion, Mr. Barry, in the face of these clauses, has complied with your conditions in his placing of the premiated designs? I am not of the opinion that he has done so, and many agree with me that I may fairly claim for design 'Let Glasgow Flourish for Ever' that it has fulfilled all the requirements of the 'conditions' ; and further, that the estimated cost accompanying this design, as also the cost as estimated by Mr. Carrick and Mr. Barry, more nearly approaches the amount proposed to be expended by the Corporation than the designs marked 'Carton' and 'Fidelity.' I may also add I am fully prepared to guarantee that my design can be carried out for the amount of my estimated cost. In these circumstances, my Lord Provost and gentlemen, I beg most respectfully to protest against Mr. Barry's award, and to claim first place and premium for my design.—I am, my Lord Provost and gentlemen, your most obedient servant, Edwd. Clarke, Gold Medallist in Architecture, Royal Academy of Arts, London ; Author of design 'Let Glasgow Flourish for Ever.'"

THE LONGEST BRIDGES OF THE WORLD.

THE new bridge which has been built for the Orenburg Railway over the Volga, at a distance of 17 versts from Syzran, in the Saratov government, is now completed, and exceeds in length all other bridges yet constructed, with the exception of the Victoria Bridge over the St. Lawrence at Montreal, which is very nearly 1¾ miles long. The great bridge at Sloerdyk, over the Hollandsch Diep, near the mouth of the Maas, in the Netherlands, which now takes third instead of second rank amongst the longer bridges of the world, is shorter than this Volga bridge by six mètres. The length of this new bridge is stated to be 696 saschenes, or 1,485 métres (=1623·986 yards). Its building was commenced on August 17, 1877, so that it has taken just three years to finish. The cost has been 4,630,000 roubles, or nearly £694,500. Four hundred thousand puds of iron, or 6,552,400 kilogrammes (=5,149 tons very nearly), have been employed in the construction. The bridge rests on 13 arches, and the plans were prepared by Professor Beleloubsky, of St. Petersburg. After this new Volga bridge and the Dutch bridge, at Sloerdyk, over the Hollandsch Diep, already mentioned, the next longest bridges in Europe are the two over the Dnieper, Kiev and Krementschok respectively, in the government of Pultova, the former of which is 1081·68 métres (=about 1,182 yards), and the latter 975 métres (=1,065 yards 2¼ft.) long. Then comes the bridge over the Waal, at Bommel, in the Dutch province of Gelderland, 917·4 métres (=1,002 yards 2ft.) in length. Next in length is the great Mississippi bridge, connecting East St. Louis with St. Louis, which was built between 1869 and 1874, and cost ten millions of dollars, or almost three times as much as the new Russian bridge ; it is 772·32 métres (844 yards) long, and rests on three arches, the middle one having a span of 158 métres. The bridge near the mouth of the Vistula, at Dirschan, in East Prussia, follows, and the Dutch railway bridge over the Lek, at Kuilenburg, on the line between Utrecht and Boxtel, which are 706·19 mètres (=761 yards 2½ft.) long. Next comes the Britannia Tubular Bridge, which is more remarkable for its admirable construction than its length of 556·84 mètres (=almost 608 yards 2ft.). The bridge between Praga and Warsaw, 507·77 mètres (=555 yards) long, comes next ; and then the fine Alexander Bridge, only finished last year, between the Finland bank of the Neva and St. Petersburg, which is 405·36 metres (=447 yards) long, considerably less than a third of the length of the new Volga bridge, and about a seventh of that of the Victoria Bridge.

The greater portion of the old block of buildings on the east side of Tanfield-court, Inner Temple, is now in course of demolition, to make way for the extensive additions about to be made to the library of this society. Plans have been prepared by Mr. Robert W. Edis, F.S.A., architect, of Fitzroy-square, and approved by the Benchers, and the works will be commenced immediately. The new buildings, which will be of Perpendicular Gothic character, will comprise a small lecture-hall and several new sets of chambers as well as large additions to the library, with librarian's rooms, &c., and will be entirely of fireproof construction.

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SKETCHES IN PARIS. — J. SALMON AND SON'S DESIGN FOR THE NEW MUNICIPAL BUILDINGS, GLASGOW.—HOUSE AT STONEYGATE, LEICESTER. — CLUB DESIGN FOR BRIDGE OVER PARK STREAM.

OUR LITHOGRAPHIC ILLUSTRATIONS.

FRENCH SKETCHES.

We reproduce a series of Parisian and other sketches, by M. Adolphe Giraldon, of Paris, which were hung at the recent Black and White Exhibition at the Egyptian Hall. Beginning at the left-hand side, the upper drawing shows the Fontaine Louvois, in the Rue Richelieu, Paris, and beneath it is the well-known tower of St. Jacques de la Boucherie, as seen from the Rue Rivoli. In the centre is a south-east view of Notre Dame, from the Quai Montebello, and below is the Pavillon de Flore in the Tuileries, where the Municipal Council holds its sittings. All these are Parisian sketches; but to the right are a street in Commines, on the Belgian border of France; the principal bridge at Orthez, Basses-Pyrenees, and at the foot of page, a view of Como from the pier.

COMPETITION DESIGN FOR THE NEW MUNICIPAL BUILDINGS, GLASGOW.

This design, by Messrs. J. Salmon and Son, of Glasgow, was submitted under the motto "Progress," and is one of the three or four best sets prepared for the recent competition. It will be observed that a Roman type of Classic has been selected as the style; the basements and ground-floors on each front are kept absolutely plain, with the aim of increasing the effect of the colonnade, and it was proposed by the authors to introduce no decorations but such as possessed some historic or emblematic interest beyond their beauty. A tower was considered unsuitable to the style, and was therefore omitted, the central feature being the domical roof. The plans in the main follow those suggested by Mr. Carrick, the City architect, with a few modifications of position of entrances, and of the height of saloons on second floor. The cost was estimated by the authors, "at the present market rates," at the sum stated in the instructions, £150,000.

HOUSE AT STONEYGATE, NEAR LEICESTER.

We hope to publish next week some particulars as to this residence, which has been erected for Mr. Charles Brown, from the designs of Mr. Isaac Barradale, of Leicester.

BUILDING NEWS DESIGNING CLUB—A FOOT-BRIDGE.

One of our recent subjects for competition in design was a foot-bridge, to be suitable for a park over a small running stream. By some delay in the post, "Sub-Silentio's" design, which we publish to-day, came to hand after date, so that it was too late to be included in the competition. We think, however, that the design is certainly well worthy of illustration, and so have made room for it. The Japanese modo of treatment in the framing is perhaps rather fresh, though a little over-done in parts. With this drawing the published series of designs for the last session of the Designing Club closes.

◆

PERIGUEUX CATHEDRAL.

The rebuilding of the Cathedral of S. Front, at Perigueux, and the works in connection with it (except those to western tower), are now advanced almost to completion. So long ago as 1852, the restoration of this interesting monument, so curiously deviating in form and style from the prevailing type of Western Europe, was projected, and, to some extent, put into execution. But it was a work of considerable magnitude, particularly as, in the opinion of the architects, it was necessary that by far the greater part should be entirely rebuilt; and it has been carried on deliberately, by successive portions.

The plan of the building is in the form of a Greek cross, each of the five squares composing it having also a cruciform character, in the plan of their vaults and domes. These five divisions, with their internal and external domes and cupolas, are of almost identical dimensions and design, the principal differences being those occasioned by the apse to the eastern bay, and chapels, or secondary apses, to the north and south transepts. Those who wish for detailed descriptions of this extremely interesting structure will readily find them in the works of Fergusson, Sharpe, and other writers.

Four of the five dome-roofed bays, namely, the east, north, south, and central, or crossing, with the apses, &c., have been rebuilt and reopened for public service. The western arm of the cross—the part corresponding to the usual nave, which was the last portion undertaken—will shortly be ready for the demolition of the temporary wall which now separates it from the crossing, and then the true effect of the interior will again be appreciated. At present, with the nave cut off from the rest, the plan presents itself in a confused manner. The transepts give the longest vista, and, as the principal entrance is into the north transept, while, in the south, immediately opposite, there is a large and elaborate retable and altar, it is difficult to properly realise the value of the eastern choir and apse. This retable is an unfortunate intruder of the Renaissance age, and has been moved and removed, as the works have progressed, from one position to another in the church, and will probably be taken away altogether upon their final completion. It is an elaborate work of wood-carving, and is worthy of notice, even from those who do not appreciate the vagaries of its style.

Upon the other side of the temporary wall, which is a solid structure of stone, there is still the confusion and noise of building operations. But the masonry, which comprises nearly the whole of the work, is completed, except for a small remaining portion of the carving, now in hand; and the scaffolding is all down, save the few spars necessary for the carvers. Some of the best preserved fragments of the ancient carving have here been built in with the new work, thus certifying its correctness; but in the previously reconstructed bays there are some details which have a very modern air. The windows are without glass; but that will not be long delayed. The removal of the screen-wall, the clearing away of the débris and materials, &c., and reinstating of the pavement of floor, need not occupy more than a few weeks.

Externally, the scaffolding is entirely removed, and the group of scale-worked domes and interposed cupolas over the piers, is now seen once more in its complete composition.

The works to this last portion of the Cathedral have occupied nearly five years.

At the north-east angle, workmen have been engaged, for the last two months, upon the demolition of certain buildings which had been appended to the church at various times, and which, of no great architectural value themselves, masked the main structure at one of its best aspects. These were principally massive walls, and vaults of heavy Renaissance design, so far as can be judged by the débris. There are also some fragments of the Geometrical Gothic period, and of other dates. This group of buildings is already levelled to the plinth line, and the clearance reveals the east end of the cathedral standing upon the slope, with the crypt, here, considerably above the ground-floor.

The tower, which is contiguous to the church at the west end, yet remains in its picturesque state of decay. Some features—the corbel tables to upper stages, the capitals of attached shafts, &c.—are almost unrecognisable. They seem to have been worked in a softer stone than other parts, probably because of their greater elaboration. The upper story of closely-placed shafts, bearing the high-pitched, scale-covered, domical roof, is also very dilapidated, and much disarranged by successive repairs, &c.

There is an archway under a house in the Place Marcillac—one of the row which conceals the cathedral from the Place—giving access to a small yard in front of the tower, and thence to the church by a tunnel-like entrance under it. Probably this was the position of the principal entrance to the more ancient church, some traces of which still remain. The doorway under the house is of Transition style, with freely-used dogtooth ornament. The approaching works will perhaps improve and reopen this approach.

It has been determined that the tower shall be restored only, not rebuilt, as were the other parts. No doubt the effect, artistically speaking, will be much the same, as the decay is so considerable that almost all the decorative detail will have to be renewed.

The works are under the direction of M. Lambert, architect, with the supervision of M. Abadie.

R. W. G.

◆

ARCHÆOLOGICAL.

Discovery of a Roman Villa near Brading.—An addition has recently been made to the historical attractions of the Isle of Wight by the finding of a Roman villa at Morton Farm, near Brading, the result of investigations by Captain Thorpe, of Yarbridge, near Brading. The external walls, as at present cleared, measure about 52ft. by 37ft., and enclose about six or seven chambers, with passages, &c., connected, there is reason to believe, with many other. In addition to tesselated floors, remains of hypocausts, flues, fresco paintings, roofing tiles, coins, pottery, and other interesting relics, there are the remains of a mosaic pavement, with a design upon it of unusual character. The design, though grotesque, appears to be symbolical. Other decorated floors are believed to exist in the vicinity. The remains evidently cover a large area of ground, much of which is under cultivation; but every facility for investigation has been accorded by Lady Oglander, the owner of the land, and Mr. Cooper, the present occupier. Excavations have been accordingly renewed, and are at present under the direction of Mr. John E. Price, F.S.A., and Mr. F. G. Hilton Price, F.G.S. Work was recommenced last week, and already a new chamber has been opened up, enclosing mosaic, the central design of which is a representative of Orpheus playing on the lyre, and surrounded as usual by animals. The border is an unusually good example of the guilloche pattern. Pottery, glass, and coins have been also found; among the latter several examples in brass of the reign of Victorinus, A.D. 268. These investigations are important in their relation to the occupation of the island by the Romans. Its annexation to the Imperial power, due to Vespasian, in the first century, and its association in the third century with the fortunes of Carausius and Allectus, are indications of a prolonged connection with the Empire, yet the historians of the island are silent as to the finding of Roman remains, or speak of them as unknown. Inscriptions or other *data* may yet be found which may shed considerable light on what is already known of the history of the Isle of Wight during the Roman occupation of Britain.

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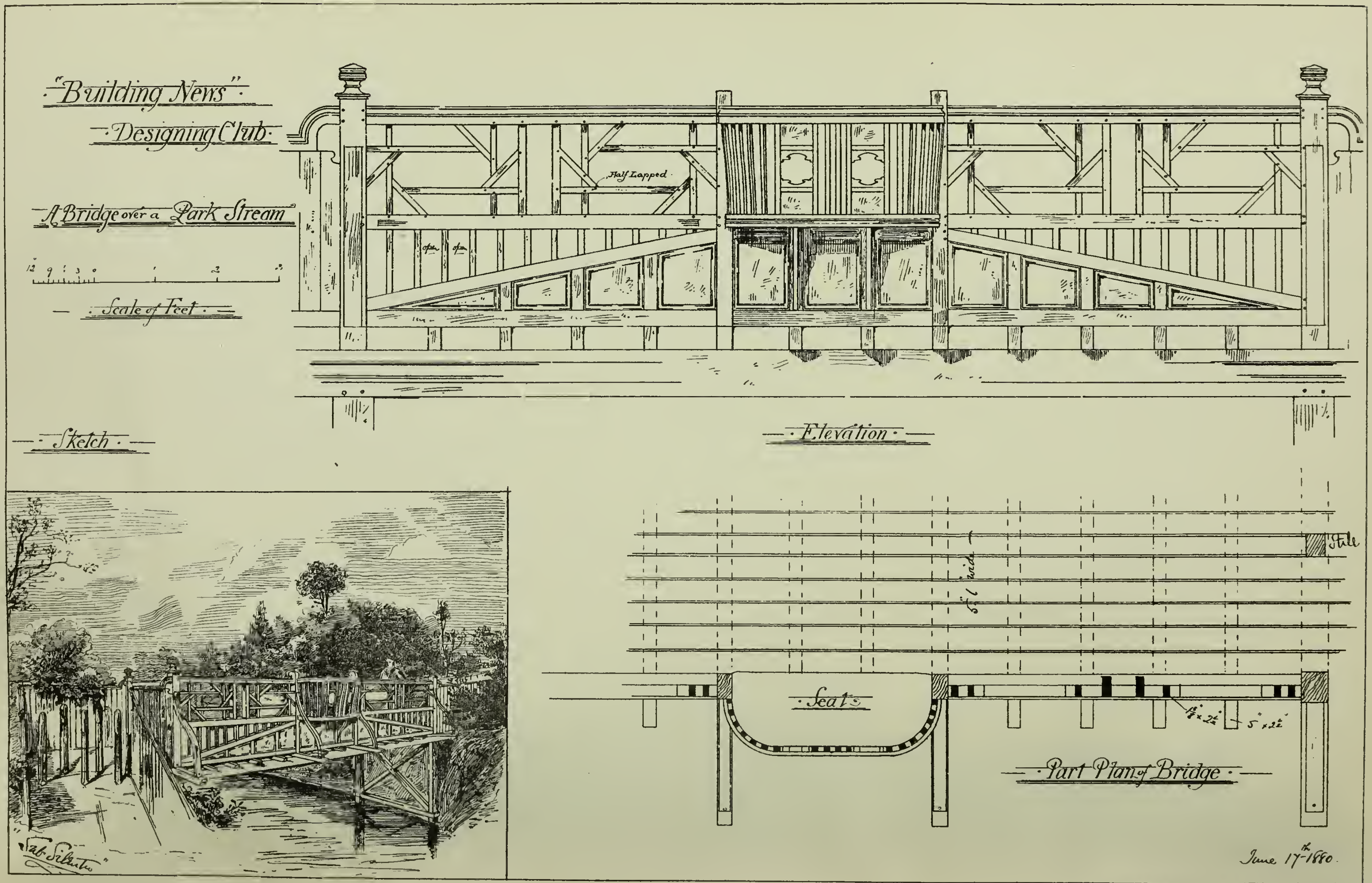
The new town-hall and market at Royston, near Manchester, erected at a cost of £7,000, was opened on the 16th inst.

At a meeting of the general committee for the rebuilding of St. Finn Barr's Cathedral, Cork, held on the 15th inst., the Bishop of Cork, in the name of the committee, presented Mr. John Delany, contractor, with an illuminated address, expressing their sense of the skill and ability with which he had carried out the contract for building the three towers and spires of the cathedral, under the instructions of their architect, Mr. Wm. Burges, of London.



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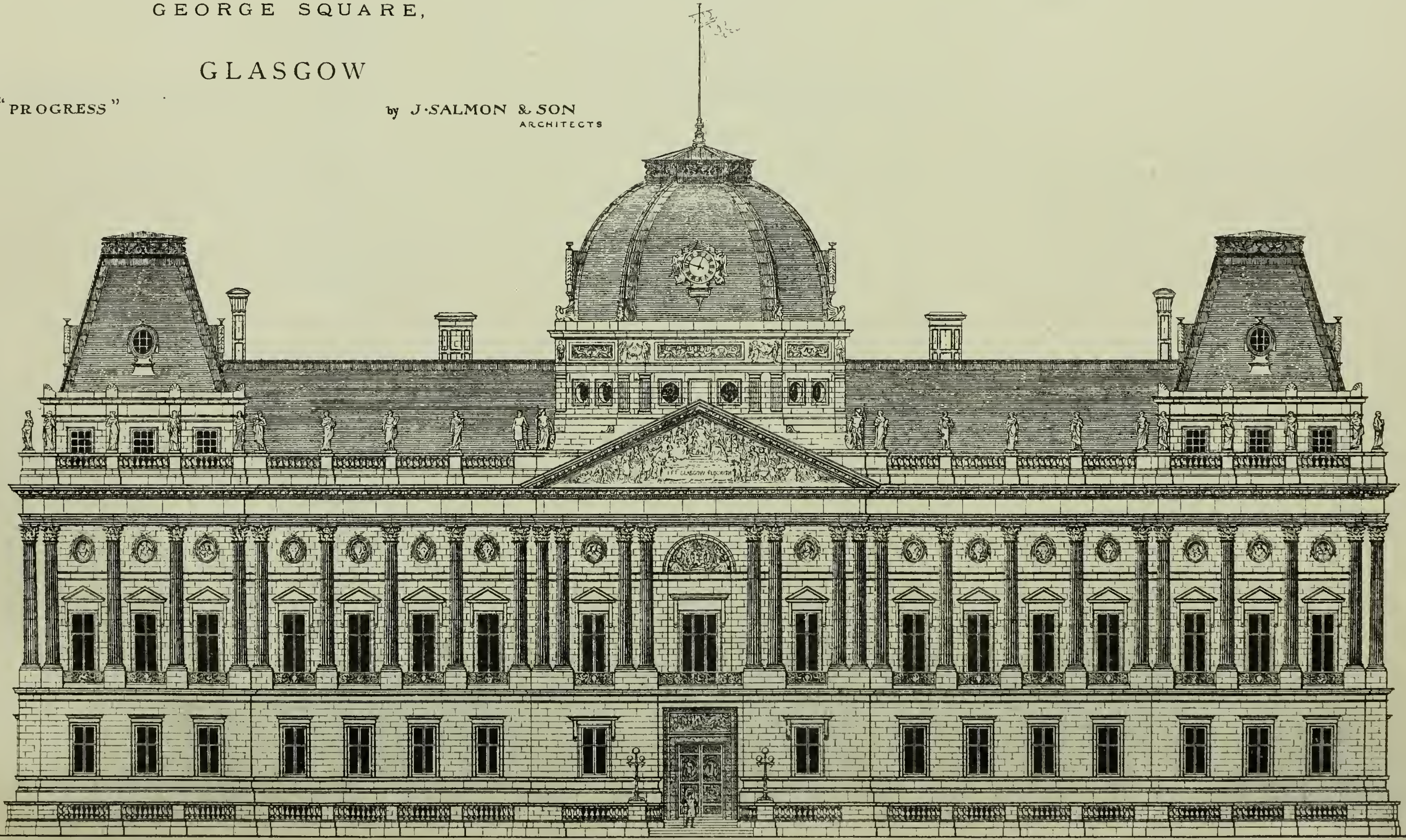
NEW MUNICIPAL BUILDINGS,

GEORGE SQUARE,

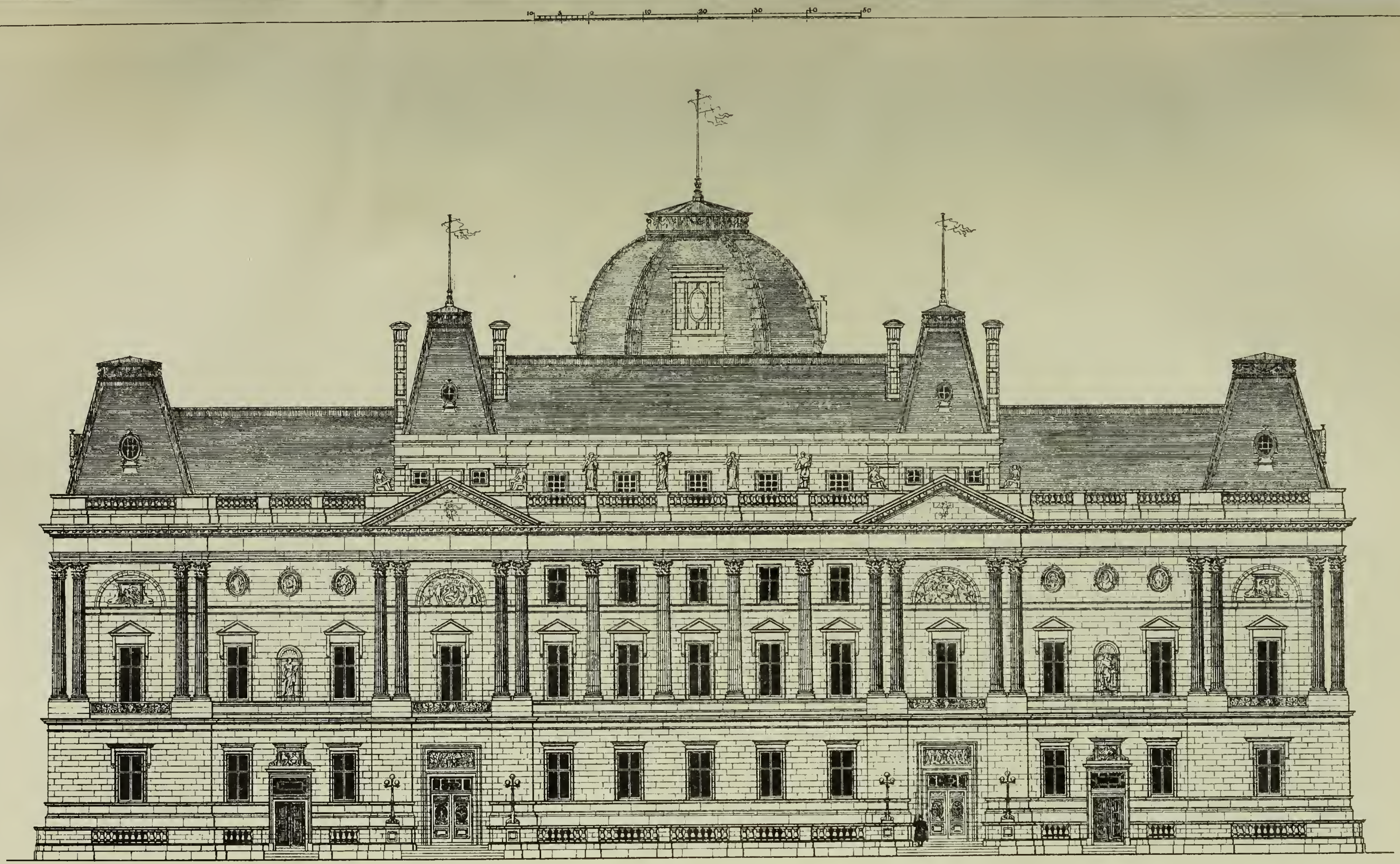
GLASGOW

"PROGRESS"

by J. SALMON & SON
ARCHITECTS

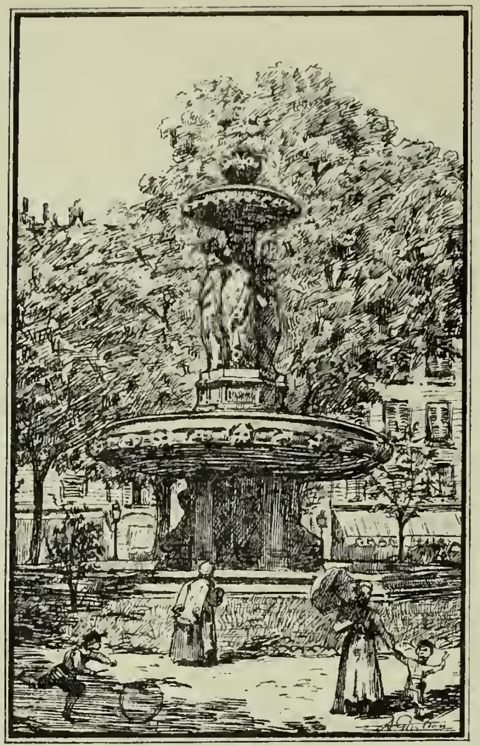


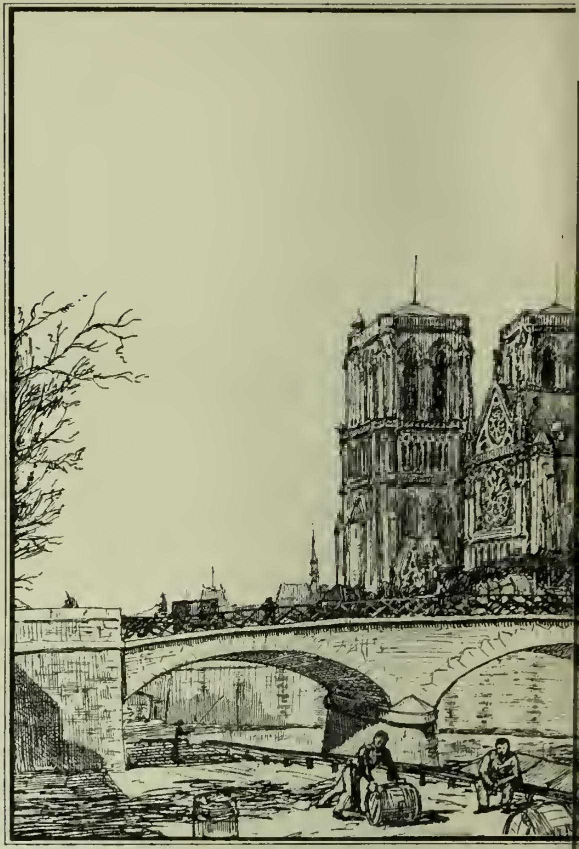
Principal Elevation

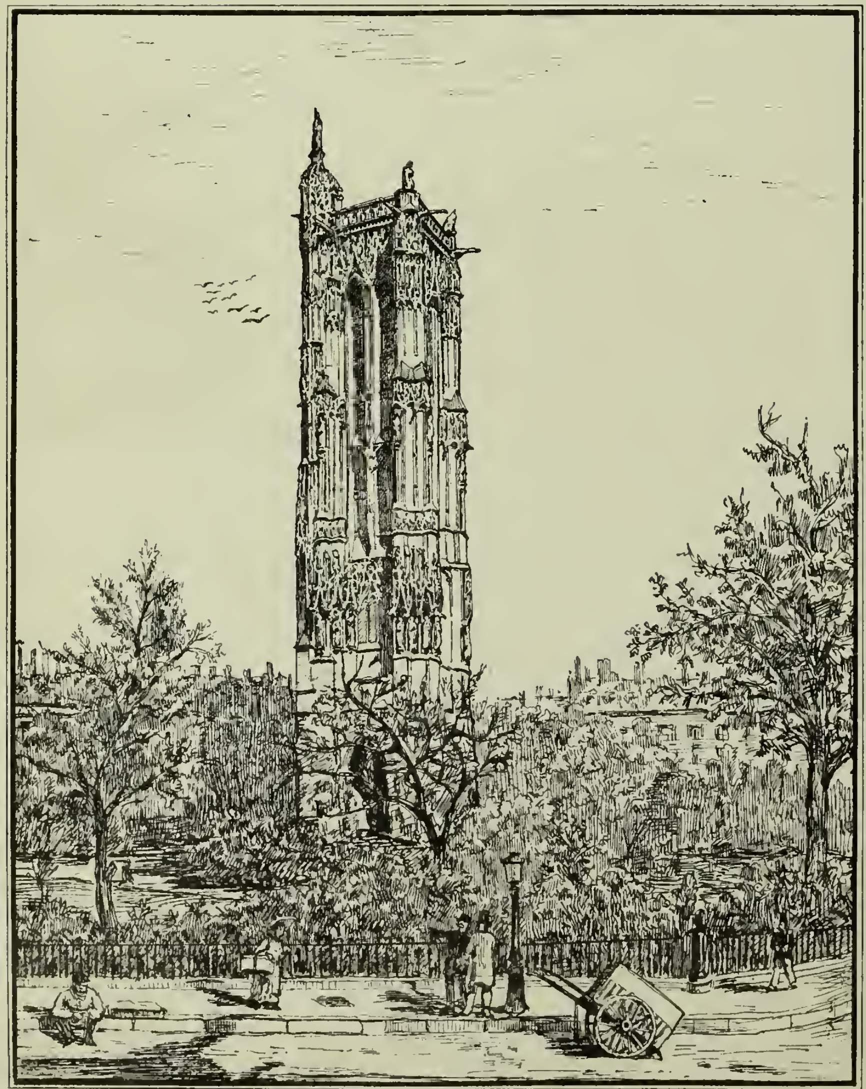


Elevation to John Street.

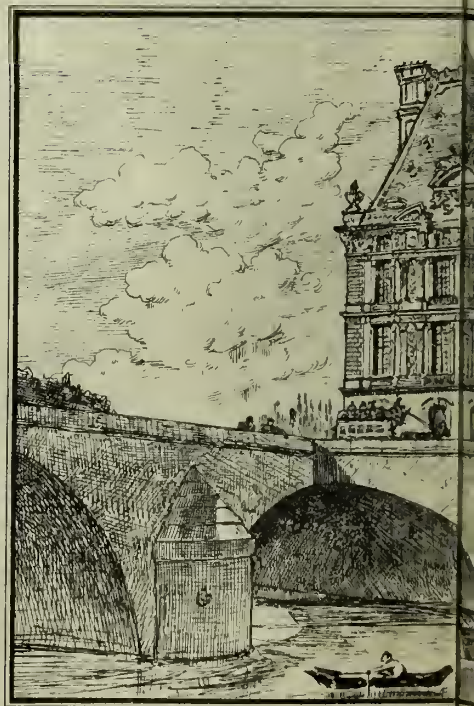
Photo-Lithographed & Printed by James Akerman 6, Queen Square W C

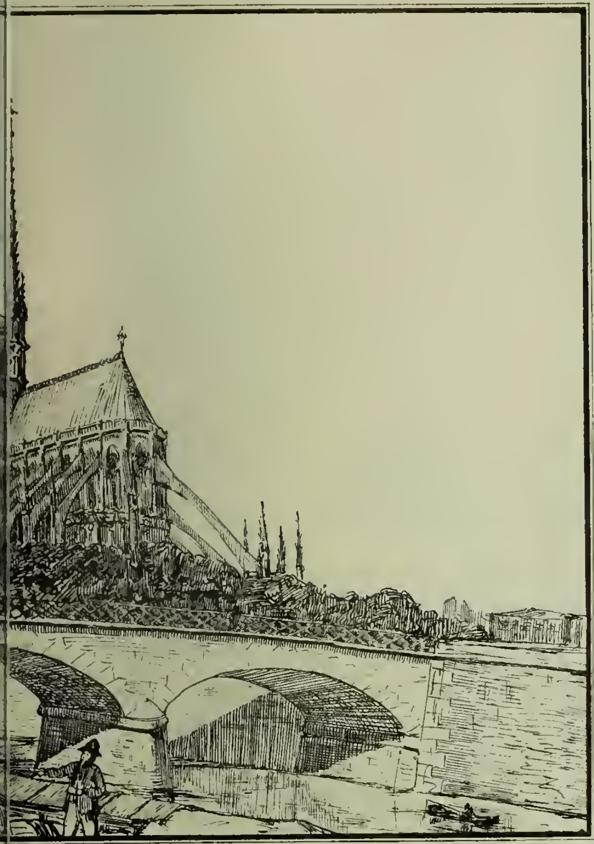


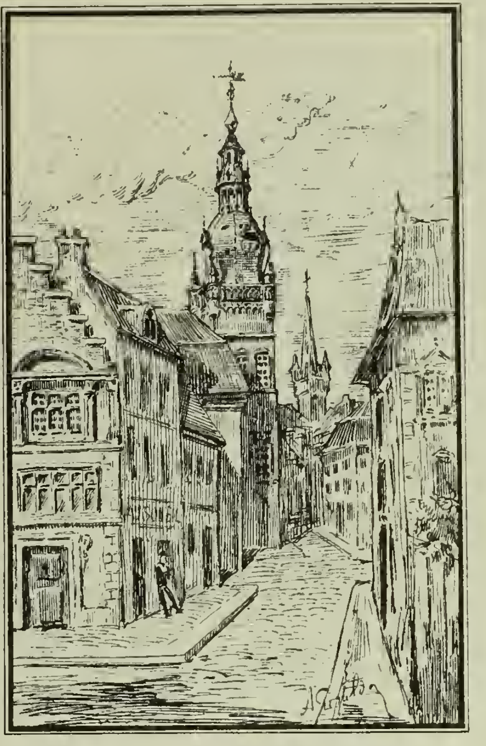


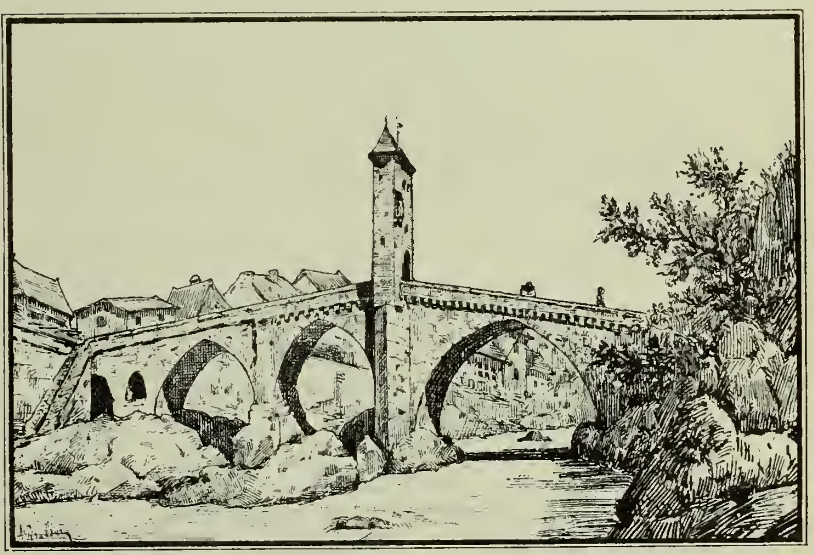


Sketches in Paris

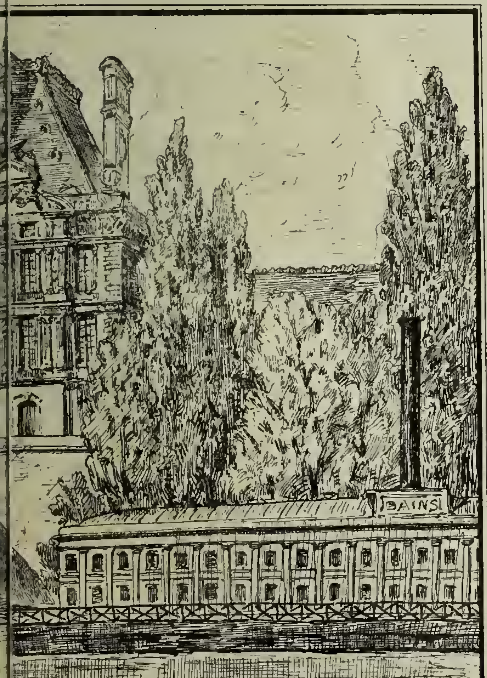


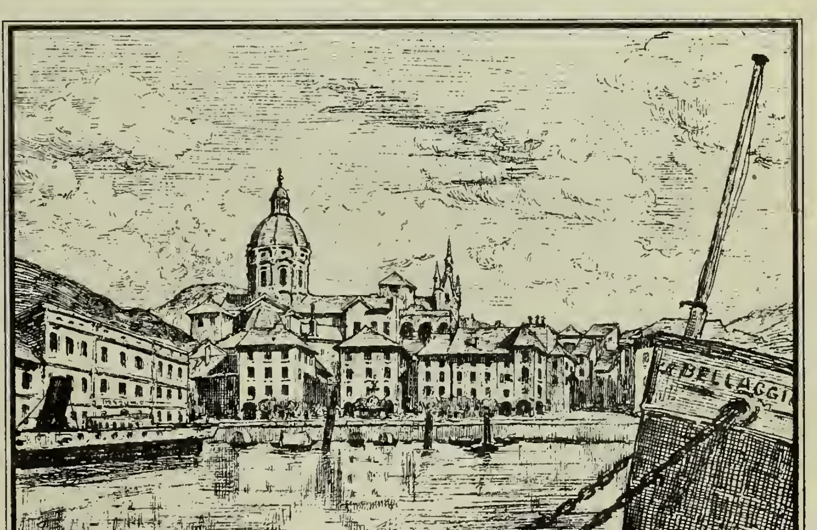






Adolphe Giraldon





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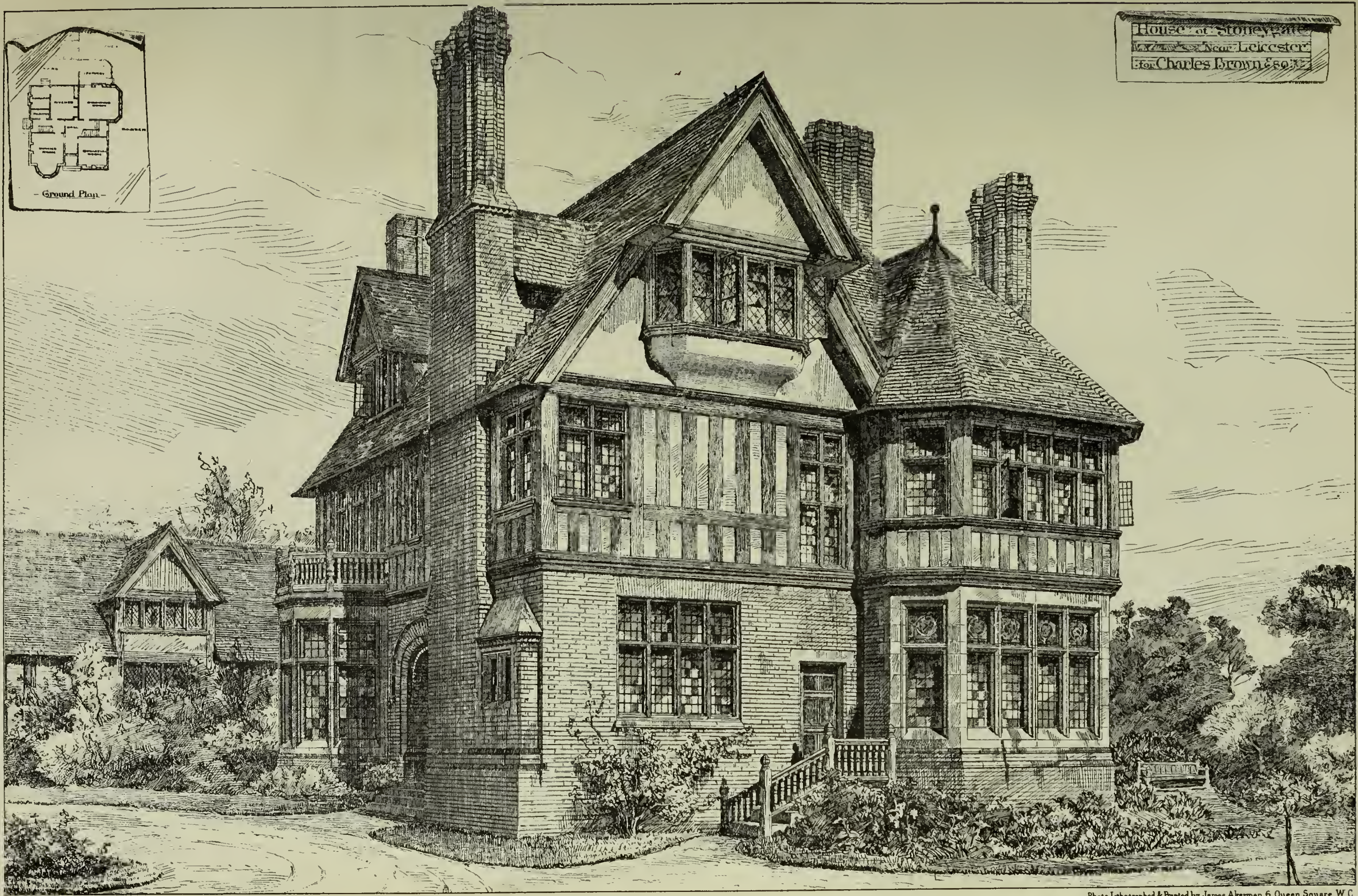

Isaac Barradale, Archt.

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THE SANITARY CONGRESS.

[FROM OUR OWN CORRESPONDENT.]

THE Sanitary Institute of Great Britain has held its fourth Congress this week: at Leamington in 1877, Stafford in 1878, and at Croydon last year, the present meeting has been held at Exeter. The Congress opened on Tuesday, and upon that day fellows, members, associates, subscribers, together with not a few outsiders, met at the ancient city of the West, which scarcely put on her pleasantest face wherewith to greet them, for the weather was not particularly fine. Still, wet or dry, Exeter has an individuality of its own, sufficient to arrest and maintain the interest of the passing stranger, whilst the Sanitary Exhibition itself—although situated in not one of the best chosen spots perhaps—offers a wide field of thought and study for the scientific mind, as well as for all those who make such useful matters as sanitary affairs their hobby.

Exeter Cathedral, with its massive Norman towers and long unbroken run of ridge from west end to eastern gable cross, is neither as lofty nor as imposing, from an exterior point of view, as are some of its fellows. One thinks of York, of Peterborough, and of Gloucester, and for the moment is disappointed. It is upon entering, especially from the west door, that the majesty, the glorious effect as a whole, and the delicate manipulation of every item of decoration, first bursts, and then fixes itself, to remain impressed for ever, upon the admiring eye. The long continuous lines of groined roofing, and the beautiful perspectives that offer themselves from every point of view, are scarcely second in architecturally artistic power to anything else in England. Apart from the cathedral, the ancient civil and domestic architecture of Exeter is also particularly interesting. The old Guildhall butts out over the High-street's pavement in a curious fashion. It is, in the main, Elizabethan, and most of our readers will remember the clever set of measured drawings that appeared in this journal some time ago,* illustrating this building. They were executed by Mr. James Crocker, F.R.I.B.A. It is worthy of note that the columns supporting its front are not only each worked out of one stone, but the moulded caps and bases are wrought from the continuous block also. That is, from the bed of each base to the top mould of the abacus above the capitals is, in each instance, one piece of granite. The High street runs through the city from east to west, and is about a mile long. It reminds one of the high streets of Winchester and of Southampton, but has rather more of the old world about it than either of them. At the very bottom of this main thoroughfare, in the part where the oldest and most curious, and the—yes, we must fain admit it—the dirtiest of those quaint old buildings are that belong to three or four centuries ago, the present exhibition is held. It is down in a locality known as the Exe Island, and in a building to be used as the slaughter-house, which has been christened for the occasion the "New Abattoirs." Close by it, and amongst several other pleasant old buildings, may be noticed with advantage an ancient house, showing a front of particularly quaint and ornamental slatework. It is of Tudor date, and altogether unlike anything else we know anywhere.

The abattoirs have been recently erected, at a cost of £4,000, and are not yet handed over to the city butchers for slaughtering purposes. Designed by the city surveyor (Mr. H. Percy Boulnois), they seem well adapted for the purposes for which they are intended; although, if, as appears to be the case, the refuse from the slaughtering will go into a drain which almost immediately afterwards empties itself into the adjacent river, we are not sure that the sanitary arrangements connected with it are by any means perfect in that particular respect.

There was a touch of the old world in the opening ceremony. In stately array, from the Guildhall to the place of exhibition (about a mile), walked the Mayor and Corporation; and a number of those met in Congress. And preceding them marched—like West Country beefeaters—the Sergeants-at-Mace, each over-hatted, and carrying the gold maces that the first George presented to the city. Then came the swords that King Edward IV. and Henry VII. gave the citizens, weapons of singular beauty and value. Altogether the grouping was odd, and as the cortége passed by the old houses, whose gabled roofs towered one over the other, the thought occurred that similar pageants had oft been witnessed in days of yore from those self-same windows.

In the evening Earl Fortescue delivered his presidential address in the Victoria Hall. He passed in review the progress of the cause of sanitation from the time of the report by Mr. Edwin Chadwick in 1842, admitting that he, together with Mr. Chadwick and other early sanitary reformers, underrated the strength of the opposition they had to encounter. He spoke of the reports made by the Board of Health of 1848 in the metropolis, and, remarking upon the recommendations of that Board in regard to interments, sewerage, and water-supply, said that the adoption of these reports, if it had not been unfortunately prevented by the ignorance and apathy of successive Governments and Parliaments, and the active opposition of interested parties, would have not only saved millions to the inhabitants of London, since pocketed by trading water and cemetery companies, but would also have added immensely to the wealth, comfort, and security of all classes. His lordship expressed some dissatisfaction with the proceedings of the Metropolitan Board of Works, and concluded by suggesting the kind of representative government which in his judgment should be given to London for the management of its own local affairs. The address, though concerned to a considerable extent with the remote subject of the government of London, was nevertheless listened to with great attention by a large audience, who seemed thoroughly to appreciate the difficulties presented in the question.

On Wednesday Mr. Rawlinson, C.B., offered some valuable suggestions for the sewering of the city, founded on a somewhat cursory inspection the previous day, but having all the weight of his wide and long experience as the senior inspector of the Local Government Board. He intimated that, standing as Exeter does on a hill, it ought to be easily sewered, and at no very large outlay, and he dwelt upon the importance of carrying out the sewering, when it should be decided upon, as expeditiously as possible. Professor de Chaumont, of Netley, afterwards read his presidential address, in No. 1 section, in which he contrasted the cleanliness of both Jew and Pagan with the carelessness and dirt introduced by the misguided and ignorant early Christians, but expressed a hope that the science of preventive medicine was now being understood, and was beginning to be acted upon. Mr. H. C. Burdett, of Greenwich Hospital, then read a paper on the "Unhealthiness of Public Institutions," reprinted elsewhere, which aroused an animated discussion; the architects being energetically defended by Messrs. E. Turner, Robins, W. White, and others; while the author's views were supported by Lord Fortescue, Drs. A. Carpenter, of Croydon; B. W. Richardson, Domenichetti, and others. The scheme of the R.I.B.A. for an examination of candidates for associateship in knowledge of sanitary requirements. A paper was also read by Mr. Burdett, on "Mortuaries," which we reproduce in summarised form. In the evening the members of the congress had a welcome rest from their labours, being entertained by the Bishop of Exeter and Mrs. Temple at a *conversazione* at the Palace, the grounds of which were illuminated.

Of the exhibition itself, which is larger and more complete than that held at Croydon last year, although the individual exhibitors are less numerous, space does not admit of our saying much this week. Local talent comes out strong, and some well-known names exhibit also. We observed that Mr. William White, F.S.A., architect, of Wimpole-street, W., shows his excellent water-closet, and Messrs. Doulton, of Lambeth, have some good things on view. Mr. W. H. Lascelles, of Bunhill-row, E C., exhibits some of his concrete. The judges are Dr. Bartlett, of Grosvenor-square; Dr. W. H. Corfield, of Mayfair; Mr. Rogers Field, C.E., Westminster; and Mr. W. Eassie, C.E., of Argyle-street, W. Dr. Richardson is the retiring president, and the Earl of Fortescue the president elect. It is rather curious that although the local committee is very strong, there is not the name of a single Exeter architect upon it. How is this? Have architects in the West no interest in sanitary matters? Perhaps someone will say. The Congress closes to-day.

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* See the Building News for April 23, 1875.

MORTUARIES FOR TOWNS AND VILLAGES.*

THE subject of mortuaries is one that has received by far too little attention at the hands not only of those who are responsible for the practical carrying out of the public health laws of the kingdom, but even of ardent sanitary reformers. Yet it holds, or ought to hold, a prominent place in preventive medicine; and it differs from other sanitary appliances in having an important moral and social office as well as a hygienic one.

After quoting Mr. Chadwick's Report on the Results of a Special Inquiry into the Practice of Interment in Towns, 1843, the author proceeds to cite cases:—

In a speech made in January, 1876, Dr. Joseph Rogers stated that an old man died in a house in St. James's let out to lodgers. As it was thought his friends would bury the body, it was allowed to remain several days; indeed, until decomposition had so far advanced as to fill the house with effluvia. The sanitary inspector was then applied to, who, in his turn, applied to the master of the Westminster Workhouse for permission to take the body to the workhouse deadhouse. The body was so putrescent that the workhouse attendants had to fill the shell with charcoal ere they dared to take it through the streets.

At a meeting of the West Derby Local Board in March, 1876, the sanitary inspector reported that in the course of his duties he had visited a house on the 23rd, and had found the body of a woman who had died on the 19th, lying in one of the rooms which was used as the sleeping-room of the family. The husband stated that as he was too poor to inter the body, he had applied to the relieving officer to have it buried, but the request had been declined by the Board of Guardians. He then went to the clerk to the Local Board, who, after some delay, got an order from a magistrate, and the body was buried six days after death. The husband, who was represented to be given to drink, and indifferent as to whether the body was buried or not, had slept, it was said, in the same bed in which the corpse lay.

The corpse of an unhappy youth at Milton-next-Sittingbourne, who died in a barge from typhoid fever, contracted through drinking polluted water, was brought to his parents' house through the streets in an open van. On the arrival of the body, the coffin was unscrewed, and remained so for two days before the burial. An outbreak of typhoid fever, confined to the street in which the body lay, subsequently broke out, and may possibly have been due to infection from the corpse.

M. Kœchlin Schwartz recently narrated to a commission of the French Society of Public Medicine—a society which has lately devoted much attention to the subject of mortuaries—a very painful case. In a small room rented by a workman, the father, attacked by small-pox, lay dying on the only bed, and round him, his wife and his five children, without fire or food, were waiting in despair till their turn came to be struck down by the disease. The mother, indeed, was in the anguish of child-birth while her husband was *in extremis*.

The author next drew attention to the remedy, viz., the provision of reception or dead-houses, in which corpses may remain pending interment. He said the able and comprehensive report by Mr. Chadwick may fairly be considered as the starting-point, amongst other things, of mortuaries. The report was published in 1843, and evoked much attention and discussion. With the more comprehensive report which preceded it, on the sanitary state of the labouring population of Great Britain, it unquestionably paved the way for the passing of the Public Health Act of 1848. In that Act there was a section which provided that for the regulation of interments in districts to which that Act applied, Local Boards might provide reception-houses for the dead, and make by-laws with respect to the management of the same, and on application, make arrangements for the interment of any corpses contained therein. This clause was practically superseded by section 27 of the Sanitary Act, 1866, but was not formally repealed until the Consolidating Act of 1875. The law remained in this state for nearly twenty years, but meanwhile the subject had received a certain amount of attention both at home and abroad. In 1852 there was a general Sanitary Congress at Brussels, and part of the third question for discussion was: "What can be the usefulness of mortuaries, and, for the cases in which this usefulness is recognised, what should be their organisation?" After discussion, the Congress declared the usefulness of mortuaries in each parish; and on the motion of our president, then Lord Ebrington, it was resolved that: "Convinced of the great inconvenience of the keeping of corpses in inhabited rooms, the Congress declares the usefulness and earnestly recommends the establishment of mortuaries." The Sanitary Act of 1866 improved the state of the English law as to mortuaries. By section 27 of this Act "nuisance authorities" (equivalent to our existing local authorities) were empowered to provide a proper place for the reception of dead bodies, and thereupon a justice, with a medical certificate, might order bodies to be removed to it, and cause removal if the relations failed to obey, charging them with the cost. The authorities were also empowered to provide places for post-mortem examinations.

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*The Necessity and Importance of Mortuaries for Towns and Villages, with some Suggestions for their Establishment and Management. A paper read by Henry C. Burdett, Member of Council, at the Sanitary Congress Exeter, on Wednesday, Sept. 22.

The Royal Sanitary Commission, commenting upon section 27, observed that "although there is this power by law, it appears to be very little exercised, and the evils of keeping the dead in the same room with the living exists very extensively amongst the poor, and this evil is aggravated by the general practice of wakes among the lower classes of the Irish Roman Catholics, who are very numerous in some large towns, such as Liverpool."

The Commissioners suggested that power should be given to the Central Authority to compel a Local Authority to provide a mortuary; and that, even where there was no mortuary, the justice should be enabled, in the cases specified in section 27 of the Sanitary Act, to give an order for the removal of the body from the house. To facilitate the acquisition of parts of closed burial-grounds, or of land in cemeteries for mortuaries, the Commissioners suggested that the Local Authority should be empowered in the case of any closed burial-ground, to purchase by contract any part of such burial-ground from those in whom the site and control were vested, for the purpose of erecting thereon a mortuary, and (if needful) a residence for the keeper. The Commissioners, formulated, however, certain provisoes to this transfer, and as these provisoes contain much suggestive matter in a small compass, I give them in full:—

"1. This shall not authorise the purchase of any piece of land if it necessitates the disturbance of bodies already buried. 2. Nor if the piece to be purchased cannot be approached without passing through any other part of the closed burial ground. 3. No religious service shall be held or celebrated in any mortuary erected in any closed burial-ground. 4. Such mortuary and residence-house (if any) shall be separated by a wall or fence from the rest of the burial-ground."

The Consolidated Public Health Act of 1875, whilst re-enacting the sections of the Act of 1866 as to mortuaries, made their provision by the local authority compulsory in cases where the Local Government Board required. The Act of 1875 does not, however, extend to the Metropolis, which, in this respect, is worse off than the country, for the Local Government Board have not the power, even if they felt inclined to exercise it, to compel the erection of a mortuary in London. In Scotland legal power is given by section 43 of the Public Health Act of 1867 to provide a place for the reception of dead bodies, and to remove bodies to it in certain cases. Nothing is said, however, with regard to post-mortem rooms. In Ireland provisions similar to those in the English Act are contained in sections 157, 158, and 159 of the Public Health (Ireland) Act, 1878, and there is this important addition: "The body of any person who has died of any dangerous infectious disease in any hospital or place for the treatment of the sick shall not be removed from such hospital, until removed direct to a mortuary or cemetery, and any person violating, or any officer of an hospital or other person who knowingly permits the violation of this provision, shall be liable to a penalty not exceeding five pounds."

(*To be continued.*)

THE TAY BRIDGE BILL.

(REPORT OF THE SELECT COMMITTEE.)

THE report of the Select Committee on the North British Railway (Tay Bridge) Bill was issued in the form of a Blue-book on Friday morning. The Committee were instructed that they have power to inquire and report as to whether the Tay Bridge should be rebuilt in its present position, or whether there is any situation more suitable, having due regard to the safety of the travelling public and the convenience of the locality; they were also instructed to pay special attention to the interests of the navigation, and that the height of the bridge should be so fixed as not injuriously to interfere with the river navigation; and to consider generally in what way any bridge that may be authorised should be constructed so as to secure its permanent safety. The following is the main portion of their report:—

Having carefully considered the details of the scheme proposed by the Bill, as well as the evidence which has been adduced by the promoters, they have arrived at the following conclusions on the points referred to them: (*a*) That the Bridge over the river Tay should, in the interests of the public and of the railway company, be reconstructed. (*b*) That the present site of the bridge is, on the whole, the most suitable. (*c*) That the reconstruction of the bridge at the lower elevation of 77ft. over four spans of 245ft. from centre to centre of piers, instead of 88ft. above high-water spring tides, will occasion no undue interference with the navigation of the river, more especially as the promoters have signified their intention, in case the bridge is rebuilt at the lower level, to provide a tug gratuitously for all vessels of and above 70 tons register passing up and down within a mile of the bride, and to keep the navigable channel clear. The Committee are of opinion that the safety of the public might best be consulted by the bridge being rebuilt upon entirely new foundations; but evidence was adduced that, subject to certain conditions, by sheet piling or otherwise, the existing caissons might be secured and utilised. This opinion might be open to reconsideration, if hereafter it should be proved that the existing caissons had been thoroughly tested and found trustworthy, or a carefully-considered plan brought forward for rendering them secure. 7. The committee have no doubt that a bridge properly constructed would resist the lateral pressure of any wind; but they have not taken direct evidence as to wind-pressure, as this subject was fully considered before the Court of Inquiry on the Tay Bridge disaster, and is now under the consideration of a committee of the Board of Trade. 8. No provision for giving any shelter to the train from the wind during its passage over the bridge was included in the scheme before the committee. This subject they consider most important, and it will no doubt receive the attention of the company's engineer in preparing plans for the reconstruction of the bridge. 9. The committee are of opinion that the undertaking given by the promoters to remove the existing railway junction from off the bridge should be embodied in any future scheme; that the gradient on the north side should be reduced, as proposed, from 1 in 74 to 1 in 101, and that it should be a statutory obligation on the part of the railway company to maintain a tug-boat in the manner proposed by them for the gratuitous use of all vessels of 70 tons and upwards, for a mile on each side of the bridge, and also to maintain a clear waterway under the four spans of the bridge. 10 In deciding to reject the Bill, the committee have also been in some measure influenced by the want of independent engineering evidence adduced in its favour, and by the great discrepancy between the plans and estimates submitted to them and those deposited in the offices of Parliament. 11. In the event of the promoters coming to Parliament next session, the committee are of opinion that the passage of the Bill would be much facilitated and the interest of the public best promoted, if the company had obtained the previous approval of their scheme by two or three independent engineers of unquestionable standing and experience. The Select Committee further report that they have examined the allegations contained in the preamble of the Bill, but the same have not been proved to their satisfaction.

Building Intelligence.

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Leeds.—Emmanuel Church, Leeds, was consecrated on Wednesday week. Messrs. Adams and Kelly, architects, Leeds, prepared the designs. The church, which is built in the Early English style, comprises a clerestoried nave, with north aisles and chancel. The church is built of stone, faced externally with pitch-faced stone, with bosted sandstone dressings. The cost of the church as at present is nearly £9,000. The following are the contractors for the several works:—Masonry, Messrs. Bentley and Burn; carpenter and joiner, Mr. William Britton; slater, Messrs. Watson and Worsnop; plumber, Mr. Thomas Story; ironfounders, Messrs. Heaps and Robinson; plasterer, Mr. Henry Eastwood; painter, Mr. Joseph Walker. Mr. Thorp executed the pulpit and font; the gas-fittings are by Messrs. Thomason and Co., of Birmingham; who also provided the lectern and other metal work. The whole of the works have been carried out from the designs and under the superintendence of Messrs. Adams and Kelly, and Mr. Brotherton acted as clerk of works.

Monmouth.—St. Thomas's Church was reopened last week after restoration, carried out by Mr. William Simmonds, builder, of Monmouth. The west and north doorways have been rebuilt in local red stone. The old tower has been removed, and a stone one in keeping with the nave erected in its place, the old bell being rehung in it. The roof has been stripped of the old stone tiles and Cadbury's silver grey slates substituted. A new window has been inserted in the east gable end. In the interior the ceiling has been raised three feet, and has been boarded with red deal, in which is worked a V sinking. This has been polished and stencilled by the contractor's men. The plaster has been stencilled to the level of the window heads by Mr. Robarts, of London. The nave is lighted by three new sun gaseliers, there being another in the chancel, in addition to 27 lights round the chancel arch. New altar rails have been also fixed in the chancel. The work has been done at a cost of £700.

Newton Heath.—Dedication services of a new Wesleyan chapel were commenced on Thursday week. The chapel stands on a plot of ground adjoining the main road, immediately opposite the old chapel. The body of the new building is a parallelogram, 69ft. by 47ft., and is surrounded by a gallery three pews deep. Accommodation has been provided for 890 worshippers. The minister's vestry and other rooms occupy the rear of the chapel. The choir apse is octagonal, defined in the chapel by a moulded arch, supported on richly carved caps, with shafts and bases. The chapel roof is octagonal, in one span, without the beams or rods. The roof and interior fittings are of pitch-pine, varnished. A sycamore band surmounts the wall boarding, and is inlaid with designs in oak and ebony. The external elevation is faced with Burnley parpoints and Yorkshire stone dressings. A tower and spire rise to a height of 125ft. at the west of the building. The chapel has been erected by Mr. Brown, of Hollinwood, from the designs of Mr. A. W. Smith, architect, of Manchester and Liverpool. The contract was let for £6,300, and the cost of the land, together with the extension of the schoolrooms, will raise the total expenditure to £9,000.

Penrith.—New premises are in course of erection here for Messrs. Graham in the Market-square. The front is of local red stone, the roofing being broken with half-timber gables. The new building, designed in the Old English style, will present a picturesque appearance. The work is being carried out by Mr. W. Grisenthwaite, of Penrith, from the design of Messrs. Hetherington and Oliver, of Carlisle.

South Hornsey.—Local Board offices are about to be erected for South Hornsey, on a freehold site in Milton-road, purchased for £1,600. The plans have been prepared by Mr. Fry, surveyor to the board, and provide on the first floor a board-room, 43ft. 6in. by 23ft. 10in., and 16ft. in height, and an ante-room, and committee-room and lavatories. On one side will be the surveyor's residence, and on the other the fire-brigade station, and a mortuary will also be provided. The principal elevation will be faced with stone, and the entire cost of the block will be £6,500.

Walsall.—The venerable church of St. Matthew, Walsall, was reopened on Tuesday, after extensive alterations and restorations. In the nave, the old cumbrous "three-decker" pulpit has been removed from its place in front of the chancel-arch, and a carved oak pulpit and reading-desk are to be substituted for it; whilst the high-backed pews have been replaced by chairs. The chancel-arch has been cleared of the organ and organ-gallery which formerly blocked it up, and has been rebuilt and widened. The eastern wall, hitherto a dull blank, is now pierced with a five-light stained-glass window to the memory of the late Sister Dora; and the windows of lead and square lights in the side walls have given place to others of 14th-century type, with stone mullions and cathedral glass, being exact copies of an original window-space found blocked up by the organ. An oak roof has been erected in lieu of the whitewashed ceiling; the ancient stalls are retained, some new ones being added; and two doorways leading into the crypt, and a beautiful canopied sedilia, discovered during the progress of the works, have been restored to the original designs. The organ now opens to the chancel with a broad arch, and in its rear are new vestries for the clergy and choir. The instrument has undergone modernisation and enlargement by Messrs. Bishop and Son, Marylebone-road, London. The tracery of the upper portion of the memorial east window is filled with representations of the four Archangels, the twelve Apostles bearing a scroll inscribed with the Apostles' Creed, the Agnus Dei, and other symbols. The lower part is occupied by ten designs, the centre one in the upper row being a figure of Christ, and those to right and left figures of the Virgin and St. John; whilst the others contain representations of the seven corporal works of mercy. It is from the works of Messrs. Burlinson and Grylls, Newman-street, London. The restoration has cost £5,000. The architect is Mr. Ewan Christian, of London; and the builder and contractor, Mr. Thomas Williams, of Harrington-square, London.

SCHOOLS OF ART.

Brighton.—The annual distribution of prizes to the members of the Brighton Science and Art classes took place, on Friday, at the Royal Pavilion. Mr. Fisher, the master of the Art School, reported a decrease upon the numbers of the preceding year, the falling off from the day classes being from 183 in 1879, to 181 last session; and, in the evening classes, from 329 to 296; while there was a decrease of 38 in the number of individual students. The receipts from students' fees had shown a greater proportional decrease, indicating a less full attendance. He attributed this falling off to disappointments sustained in the examinations for 1879, and also to the general depression. Notwithstanding a diminished number of students, there had, however, been a marked improvement in the number of successes obtained; and the Government grants had increased from £234 7s. 6d. to £269 13s. Of the works forwarded to South Kensigton, 26 obtained awards in the National Competition, comparing with the previous year as follows:—Gold medal, 1879, 0; 1880, 1; increase, 1. Silver medal, 1879, 2; 1880, 0; decrease, 2. Bronze medal, 1879, 3; 1880, 1; decrease, 2. Queen's prizes, 1879, 2; 1880, 4; increase, 2. 3rd grade prizes, 1879, 20, and four supplementary awards; 1880, 20; decrease, 4. Prizes have also been awarded in the National Art competition to members of the Science Classes in Building Construction, and in Machine Drawing, namely:—One Queen's prize, six third-grade prizes, and six second-grade prizes, for Building Construction (the only first-class honours awarded to a school in this class); and one second-grade prize for Machine Drawings. Last year, no awards of this class were obtained.

COMPETITIONS.

Designs for Furniture.—The Council of the Society of Arts are trustees of the sum of £400, presented to them by the Owen Jones Memorial Committee, being the balance of the subscriptions to that fund, upon trust to expend the interest thereof in prizes to "students of the schools of art who in annual competition produce the best designs for household furniture, carpets, wall-papers and hangings, damask, chintzes, &c., regulated by the principles laid down by Owen Jones," the prizes to "consist of a bound copy of Owen Jones's 'Principles of Design,' a bronze medal, and such sums of money as the fund admits of." The prizes will be awarded on the results of the annual competition of the Science and Art Department. Competing designs must be marked "In competition for the Owen Jones prizes." The next award will be made in 1881, when six prizes are offered for competition, each prize to consist of a bound copy of Owen Jones's "Principles of Design" and the Society's bronze medal.

Swimming-Baths for Richmond, Surrey.—A special meeting of the Richmond Select Vestry was held on Tuesday week, when, after a heated discussion, the report of a committee, who unanimously recommended the adoption, with some slight modifications, of the scheme denoted by the motto "Natation," was adopted. The sealed packet bearing the same motto was then opened, and found to contain the name of Mr. Frank D. Lockwood, of 10, Lincoln's Inn Fields. Several members expressed satisfaction that the successful competitor was a resident in Richmond, and the committee was instructed to communicate with Mr. Lockwood. As the plans were estimated to cost considerably more than the £1,500 proposed, it was decided to apply to the Local Government Board for sanction to borrow an additional sum of £2,000. On Thursday, however, the select vestry was resummoned, Mr. Lockwood having explained that he was the author, not of the selected design, but of a second set of drawings bearing the same motto, and which had been dealt with by the committee as an alternative set. The seal of the second envelope entitled "Natation" was then broken, with the result that Messrs. George Elkington and Son, 95, Cannon-street, London, E.C., were found to be the premiated architects. Mr. Lockwood also wrote complaining that three weeks after the competition was announced, a second set of instructions was published, which necessitated serious alterations in plans, and also gave £1,500 as the limit of cost, to which he had strictly adhered; had he been aware more money was at the committee's disposal he could have produced a more elaborate design. The accepted design, it seems, is estimated to cost £3,200, and a long discussion ensued. It was proposed to reopen the competition on the ground that all the designs exceeded the limit of cost, but this was pronounced unfair, and the vestry clerk stated it was illegal. Mr. Clarke said they had seen certain plans and accepted them. Their neighbour, Mr. Lockwood, said they were not his, but that did not alter the plans. They had accepted a design, and they ought to accept the person who produced it. He thought they ought not to ignore a plan simply because it was not by Mr. Lockwood, a gentleman whom they all knew and respected. Eventually, it being shown that further controvery was useless, the design of "Natation" in red ink having been already accepted, the minutes were read and confirmed, and the members separated.

Westminster Vestry Offices.—A meeting of the united vestry of St. Margaret's and St. John's, Westminster, was held on Tuesday afternoon, when a report was presented by the joint parochial offices committee submitting Mr. Barry's report on the competition designs. It was proposed by Mr. Baker that Mr. Barry's report, recommending the award of the 1st, 2nd, and 3rd premiums to "Stet," "Portcullis in Circular Strap," and "Black Star" respectively, be adopted. Several members objected that none of the competitors had, according to Mr. Barry, kept within the £15,000 limit of cost, and that, therefore, no competitor deserved the premium. The general opinion was, however, that £15,000 was an insufficient sum to meet the requirements of the vestry, and that it was desirable to provide adequate and suitable offices even at a cost of from £7,000 to £8,000 more than was originally contemplated. Mr. Cooper urged that, strictly speaking, they would be justified in paying the first premium to "Stet," as he estimated the cost of the vestry offices proper at £10,032, much less than the stipulated cost, although Mr. Barry thought this part of the scheme could not be built for less than £15,779. Mr. Hamborg proposed as an amendment that Mr. Barry's report be not accepted until the vestry decide whether they will spend more than the £15,000 originally voted. On a division the amendment was defeated by 21 votes to 13, and it was decided by 23 votes to 7 to adopt the recommendations of Mr. Barry and to refer the matter back to the committee with instructions to consult the author of the first design, and report back. The sealed envelopes containing the candidates' names were then opened with the following result:—1st, "Stet," Messrs. Lee and Smith, 7, Queen Victoria-street, E.C.; 2nd, "Portcullis," Mr. John Evelyn Trollope; 3rd, "Black Star," Messrs. Hunt and Steward, 3, Victoria-street, Westminster. It was next proposed that the sealed envelopes containing the names of the unsuccessful candidates be opened, but this was strongly objected to by Mr. Trollope, senr., and Mr. T. Verity, and on a division was defeated. A further resolution that the whole of the designs be publicly exhibited was pronounced by the chairman and others to be inexpedient, and it was proposed to hang only the three premiated designs, but by a majority the members resolved to exhibit all the designs. By a subsequent resolution it was agreed to pay Mr. Barry a fee of 100 guineas for his report. It was stated that in the event of Messrs. Lee and Smith being appointed architects for the new offices, the £100 premium will, under the terms of the conditions, merge in the ordinary commission. Mr. J. E. Trollope, whose design is placed second, is a younger son of Mr. G. Trollope, builder, of Parliament-street, Westminster, an influential member of the Vestry. We understand that Mr. J. E. Trollope was, till recently, a pupil of Mr. A. M. Blomfield. We may remark that in our review of the designs published on July 9th, before Mr. Barry had reported, we placed that by "Stet" in the first place, describing it as "unquestionably one of the boldest ink designs in the room," adding "the design marked with a 'Black Star' is also a clever English-Renaissance design."

CHIPS.

The London and North-Western Railway Company are extending their portion of the Victoria Station, Manchester. The contract has been taken by Messrs. R. Neill and Sons, of Strangeways, Manchester, and will occupy several years in execution.

Sir Henry A. Hunt, C.B., has just made his final award in respect of properties to be taken compulsorily under the Wolverhampton Artisans' Dwellings Scheme, by which about £250,000 will be expended in improvements in the centre of the town. The total value of the property arbitrated upon is about £60,000, including some valuable licensed premises and places of worship.

A new church is in course of erection in Astley-street, Blackburn-road, Bolton-le-Moors. The church, which is dedicated to All Souls, is being built at a cost of about £20,000 under the will of the late Mr. Nathaniel Greenhalgh, of Thornydikes, Sharples, near Bolton. The style of architecture adopted is Transition, between Decorated and Perpendicular, from the drawings of Messrs. Paley and Austin, architects, Lancaster. The church will contain 800 sittings.

A singular point as to the ownership of one of David Cox's pictures was decided on Thursday week in the Bangor District Court of Bankruptcy. It was whether the signboard of the Royal Hotel, Bettws-y-Coed, painted by Cox, belonged to Lady Willoughby D'Eresby, the lessor of the hotel, or to the trustees in the lessee's bankruptcy. Judgment was given in favour of the lessor. It was stated that a connoisseur was willing to give £1,000 for the picture. The signboard was painted by Cox in 1847, and was fixed to the outer wall of the hotel, being retouched by the painter in 1849. In 1866 it was removed to one of the sitting-rooms, and subsequently fastened to the wall of the hall, and had remained 14 years in that position.—A correspondent calls attention to another celebrated signboard, that at Wargrave-on-Thames, near Henley, which is supposed to be the work of two living Academicians. The sign, he says, "represents 'St. George and the Dragon;' on one side 'The Combat,' and on the other 'After the Combat,' where St. George has descended from his saddle, and is refreshing himself with a pint of presumably Wargrave ale. The pictures are by Leslie and, I think, Watts, and although rather faded, are well worth seeing."

Mr. George Rhind, superintendent of works at Arbroath Harbour, has resigned that appointment, having been elected engineer of the new harbour works at Plymouth, New Zealand.

Mr. G. Fagg, architect and surveyor, of 8, Old Jewry, has been appointed surveyor to the Capital and Counties Building Society, 2, Broad-street-buildings.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Correspondence.

To the Editor of the Building News.

COMPETITIONS AND THE PROFESSIONAL ARBITRATOR.

Sir,—My connection with the memorial presented a few months back to the President and Council of the R.I.B.A., on the subject of architectural competitions, is my sole reason for trespassing once more upon your space. Two important competitions have recently been adjudicated upon by Mr. Charles Barry, who, it is well to note, was not announced in the original instructions as the arbitrator or assessor in either case, nor had he, I believe, been consulted upon them—a course which would have been more desirable, and, in all probability, would have mitigated the severity of the tea ot-storms that his awards have called forth, though it would be hardly possible, in the case of the Westminster Vestry Hall competition, to have had better drawn instructions, or to take exception at the fairness that has characterised the conduct of the promoters throughout. I do not propose to discuss those awards, or to comment in full upon the letters that have appeared in your journal on the subject. Mr. Charles Barry is perfectly well able to defend himself, and is not likely to be shaken in his expressed opinion because his action in these matters meets with disapproval in some quarters.

It may, for aught I know, be a disappointment to the profession generally to find that Mr. Hugh Roumieu Gough did *not* sign the memorial, and to learn his reasons for so doing; I confess I do not find them convincing, but that is merely my opinion, and to any who are depressed by his letter I would say: Take heart; remember the names of the men who have signed; and they may come to the conclusion that our efforts to secure justice and unity on this important question are not likely to be shipwrecked because Mr. Hugh Roumieu Gough stands aloof.

But it is well that the public and the profession should bear in mind what the position of the Memorialists is. I believe it to be this. The competition system exists: its good as well as its bad points are too well known to need elaboration here. Our profession has so enormously increased in numbers, that it is no matter of surprise that if the public find they can obtain drawings for any public building, however insignificant, and however small the premium offered, they should resort to competition. So a traffic is created, in many cases very discreditable to promoters and architects alike; this being so, it becomes necessary to regulate this traffic.

No one acquainted with the subject supposes for a minute that the appointment of a professional expert is to cure all evils and to head all the soreness that must result from the system; but what I think the memorialists say to promoters of competition is this:—We have spent years in acquiring what knowledge we possess; if in reply to your invitation we devote our experience, time, study, and money, to the preparation of designs, we have a right to demand of you fairness in selecting from them. You doubtless know generally what you require; but special skill is required in the preparation of precise instructions, so that all may tender upon intelligent bases; this can best be done by the man who has won his laurels as an architect of established reputation; and his advice will be most useful to you here and save a world of trouble afterwards. Secure such services, announce in your circular the name of the architect you have called in to advise you. If it be asked why a professional assessor is necessary, the answer is an easy one. Are you, a body of laymen, competent to decide upon the rival merits of professional skill? Given the best intentions, will you not find it bewildering and full of difficulties? There are, perhaps, laymen fitted for such a task, but they are the exceptions that prove the rule. This work of selecting is an anxious one for the expert; how much more difficult for a body of men, not experts, but probably ignorant of architectural knowledge? One likes one thing, one another; showy drawings captivate, and trash is often chosen, and the Dogberries and Verges squabble among themselves.

But, Sir, as your columns have shown times out of number, the worst evils are those resulting from the fight being often sold; that competitions are too frequently shams; the selection is practically made before a design is sent in, and prizes are secured by unscrupulous means, employed both by promoters and architects.

We have seen that the "motto" is no protection under such a system; that touting goes on all round, and that, in case after case, premiums have been awarded, not for the merit of the designs, but because the authors of them had friends at court, local influence, and used their utmost endeavours to snatch the prizes, by foul means if not by fair.

Explosions upon paper follow the announced decision. Men fighting fairly are disheartened; but the next invitation produces another display of drawings, and more explosions to follow. *O tempora, O mores!* But what care public and irresponsible adjudicators for such explosions? Very little indeed. Now, if a well-known professional adjudicator be called in, he consults with and learns the requirements and wishes of the promoters, he formulates, in precise terms, the instructions, and when the designs are sent in, brings all the skill he possesses to bear upon his judgment. Free from local influence, unapproachable by promoters and others, he sees through shoddy work and ignorance, weighs the rival merits of plans, elevations, and sections, and then, to the best of his ability, gives his award. There are many men capable of fulfilling all these conditions, and the result of such a system would be that the public are bound to be the real gainers, as better men will compete if they know that merit and honest compliance with the instructions issued will be recognised. Incompetent men will hesitate to expose their weakness to an eye skilled in the art they but dabble in. Lastly, an assessor knows perfectly well that his own reputation for skill and fairness is at stake, and that woe be to him if caught giving an unrighteous judgment!

This safeguard of the professional assessor is demanded in the name of fairness to all concerned, as the best remedy possible to check the evils of the system; reform can only be achieved by combination, and I do not envy those who, knowing and admitting the mischief of the happy-go-lucky stylo of selecting designs, stand aloof, and will not join those whose desire is that competitions, if they are to exist, should be put on a better basis, and justice secured to the honest competitors.—I am, &c.,

Cole A. Adams.

11, Holden-terrace, Grosvenor Gardens, S.W.,
Sept. 22.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—As one of the competitors who have adhered to the condition requiring absence of colour and etching, I consider myself entitled to ask how Mr. Barry can justify evasion of this stipulation on the part of so many of the competitors. The condition was distinctly geometrical outline; and the shading of windows on first and second premiated designs, and in so many of the others, violates the spirit of that requirement. I presume this was not sanctioned in reply to any query from intending competitors, otherwise the council would have seen their way to issue amended conditions to every competitor, so that all might be on the same footing.

It is true Mr. Barry, or any professional man of skill and probity, would give no weight to the adventitious effect thus obtained, but it is not in human nature to avoid being influenced by effect as well as merit, and we all know there is such a matter as the art of putting things, which in this age of superficial judgment is by no means to be ignored.

However this may be, the fact remains that the first and second premiated designs have taken advantages which were by the conditions inferentially forbidden. Another and more important point of objection to Mr. Barry's award consists in the architecture of Mr. Corson's design, which I should imagine scarcely seconds the wish of the Council, that the style employed should be of a broad and dignified, rather than florid, character. The style chosen may be appropriate for a comparatively small building, but, his own design being witness, does not easily lend itself to an extensive subject.

Note the repetition of stories, none being in reality dominant; the absence of breadth, the repetition of similar parts, which of itself is calculated to destroy interest; the fact that there is neither base or crown in the proper sense; the fact that the style does not afford a tower of the form employed, and Mr. Corson, therefore, has had to touch the borderland of Gothic architecture with a resulting incongruity.

The fact, however, that Mr. Corson has followed Mr. Carrick's plan in its chief features is, I think, a merit in the light of the conditions issued, apart from the question whether that plan was the best or not: with this, as competitors accepting certain conditions, we had nothing to do. Undoubtedly a finer plan can be produced, and has been, by some of the competitors (to whom it would be invidious to refer), and so afforded them opportunity of conceiving most excellent elevations.

It is gratifying that Mr. Barry has recognised these conditions, and limited himself in choosing to those designs which adhered to it; for it is evident that those who disregarded this stipulation working free of its fetters, enjoyed an advantage not really conferred by the conditions, however desirable it may have been.—I am, &c.,

Mendelssohn.

Sir,—The award by Mr. Barry has called forth a good deal of disappointment and discontent. One good, however, it has done, is that it has given *information*, and as "knowledge is power," the citizens of Glasgow are in a better position now to be able to judge the sort of building to be erected that would be both a credit to them and an honour to the city—a city which aims at being considered "the second city in the empire."

That the design which has got the first prize is not worthy of Glasgow seems to be pretty clearly set forth in Mr. Barry's report, and for it, therefore, to be accepted, would, I consider, be anything but either a credit or an honour to it citizens or to the city.

Mr. Corson says, in a letter to the *Glasgow Herald*, that because he has stuck to the £ s. d., that, therefore, his design ought to be chosen for the proposed new buildings. That does not necessarily follow, however, and it is not included in the conditions of contest. Had Mr. Corson desired to be the author of not only the *prize* design but also of the *best* design, it was equally open to him as to others to send in two designs, viz., one for the £150,000 expenditure, and another showing what he thought worthy of Glasgow.

Not having done so, he is entitled, in my opinion, to no more than the £750, and with that payment I consider, as a Glasgow citizen, that we should bid him good-bye, and take Mr. Barry's hint to choose one of the other better designs. In regard to these, each one will have his own opinion; for my part, I thought most of those by "Civis Sum" and "Spes Dulce Malum." "Town Hall" also caught my fancy, but I fear Glasgow is rather smoky for it.

Whatever is done it is to be hoped that a better choice will be made for our new Municipal Buildings than a range of warehouses with a nondescript auld kirk steeple in the centre for ornament.—I am, &c.,

A Glasgow Burgess.

Sir,—The feelings awakened by the report of Mr. Barry on the designs submitted for the New Municipal Buildings of Glasgow have by no means yet subsided; but the tongues of the architects here are, in a measure, tied until the selection of the fortunate man who is to be intrusted with the erection of the building, since every one hopes that he may himself be chosen. The principle of *palmam qui meruit ferat* has been set aside with disdain by the arbiter whose assistance and advice the Glasgow Town Council were rash enough to call in. The designs of greatest merit, though costing no more, or even less, than that actually named for the first prize, are thrust into the background, and the premium awarded to one which is not only estimated at nearly 50 per cent. more than the allotted sum, but which violates in several other points the terms assigned to competitors! As a consequence, demoralisation has set in; disguises are thrown aside, influence is being brought to bear, and private canvasses are actively prosecuted. Provost Collins, who has been throughout the *dux et auspex* of the Council, and who evinces much determination of character, has erected workshops and offices for his wholesale stationery and school-book business little inferior in architectural pretension to what the New Town Hall will be, if completed according to Mr. Corson's designs, and is probably bent upon indulging his own taste in the selection of the plans. He has not yet given any sign of willingness to make good the pledge he publicly gave of defraying the costs of the premiums out of his own pocket in the event of a failure occurring, though it is probable he may be reminded of it before the matter is concluded. How it should have happened that a gentleman wholly unconnected with the town, as Mr. Barry is, should have had power to throw everything into confusion, and humiliate the local architects, is a question which everybody is asking, but to which nobody is able to give a satisfactory answer.

But what is to be done? Here is evidently a case for the interference of the Glasgow Institute of Architects as a public body, if they should think fit so to determine. A petition to the Court of Session to set aside the award in terms of the Paper of Instructions, and ordain parties to begin again *de novo*, would be the regular and proper course of proceeding; and there is little doubt that, if such a petition were presented, the prayer would be granted. The Scotch Courts possess a discretionary power of interference in cases of violation of contract, such as is vested in the English Court of Equity. Such a case as the present, I believe, would afford good grounds for praying an "injunction," and an "interlocutor" or "decreet of Session" would answer the same purpose. A petition to the above effect might be presented by any architect who considers himself aggrieved; but this is a course open to obvious objection, and much the most dignified and effectual method would be by a public body, if there be unanimity of feeling and public spirit adequate to that end.

About the designs, there is little to be added to what I have already suggested in a previous communication. There is a grievous want of distinctive character—an absence of *motif* or "motivation"—in them all. An essential requisite for the plan of such a building is that its public character should somehow be indicated, and its style sufficiently raised above that of adjoining structures. This might be easily enough done by a colonnade and open galleries, if the design were conceived in a spirit worthy of the object, and carried out, as it should be, with generosity and munificence. The interior quadrangle would then have its colonnade, and the four sides of the prolonged façades naturally lend themselves to open galleries on the first floor, in the principal front at least. This would at once indicate the public character of the edifice, and impart to it an air of nobleness which is quite wanting in the designs sent in. I alluded, in my previous communication, to two out of the few existing old English town-halls, Abingdon and Lynn. The former of these is stated by the inhabitants (I do not know whether correctly or not) to have been designed by Inigo Jones. The plan at all events gives evidence of a municipal feeling and generous spirit existing in the corporation and their architect two centuries and a half back, for the open galleries of the front are the leading features, and are of high merit, reminding us of the buildings of Padua and Vicenza. In the same way the old Gresham Exchange, destroyed by fire in 1838, and replaced by the splendid structure of Sir William Pite, equally evinced, both in the old and new form, the existence of a liberal and really municipal spirit. The quadrangle was not jealously closed against public access, but constructed with a noble colonnade, which is, in fact, the main ornament and most valuable feature of the building. Can we and our town council, and the architect they may employ, not take a lesson from such examples?

The Council were warned by their Provost against following the precedent set by Manchester. The cost of that grand Town Hall, the noblest civic edifice yet reared in Britain, did not exceed £260,000, excluding, of course, the charge for the site, which in our case has been long since defrayed. It is evident that the Glasgow Town Council, under the guidance of their advisers, self-constituted or otherwise, is in a fair way to spend an equal or larger sum; and if the premiated design is to be proceeded with, it is much to be feared that there will really be nothing to show for it.—I am, &c.,

Glasgow, Sept. 20. Vitruvius Caledonius.

Sir,—There is a jocose old recipe given for finding the cost of a design by taking the number of the first cab that passes as representing pounds sterling. I was reminded of this by reading the recent letter of the premiated architect to the Glasgow Town Council of how his estimate was made. He takes as his basis the fact that the Leeds Town-hall was built at a shilling a foot; but that not answering his purpose, he assumes that building is done at Glasgow twopence a foot cheaper than at Leeds, and so obtains the tenpence which his design requires. This is simple and ingenious. But you may perceive, the plain fact that building operations, since the time the Town-hall was built (over twenty years), have increased in cost quite 37 per cent., is sweetly ignored. That Town-hall shilling is now 1s. 4d.; labour at that time was sixpence an hour, now it is ninepence; bricks, then 24s. per thousand, now, 45s.

As to the twopence a foot deduction, those believe who will; it is more convenient than convincing. Now, Sir, if this estimate were correct, it proves a great deal, as it must be equally true for others, and those better-class designs, referred to by Mr. Barry, ought not to be set on one side on account of cost. A more thorough muddle than this competition it is difficult to conceive.—I am, &c., M.

[Our correspondent is in error. Mr. Corson says, in his circular, that the Leeds municipal buildings now erecting—and not the town-hall built over 20 years since—cost 10d. per cube foot, and that he added to this in his estimate for the Glasgow municipal buildings 20 per cent., equal to 1s. per cube foot.—Ed. B. N.]

GREAT SPAN ROOFS.

Sir,—I hope you will give me a chance of correcting two errors in your article headed as above on p. 321.

You dispose of the rather complex question—Is it best to cover a large area by one or several spans? in less than two columns. I remember hearing a discussion on the same which occupied three nights, and then decided by members present that every case must be taken on its own merits. So much depends on the value of land, &c., and with centre columns or walls in your railway-station you lose a line or lines of rails for ever. This alone is a very grave consideration.

It is said that Paxton taught us to cover over great spaces on the ridge and furrow principle. This is wrong. A Mr. Sylvester, an engineer, taught us, and Paxton applied it, as at Sydenham; exactly as in the case of road-making—a Mr. Lockhead, of Glasgow, first taught us, and Macadam applied it largely, and, like Paxton, has had the credit tacked on to his name. Such is the luck of this life.

Again, the article says that the Birmingham New-street roof is constructed on the bow principle, with cast-iron arched girder. This is wrong, it being constructed wholly of wrought-iron.

A good detail description of the roof will be found in Mr. R. M. Bancroft's paper on King's-cross and other large station roofs, amongst the Transactions of the Civil and Mechanical Engineer's Society, and also published by the Building News ten or eleven years back.—I am, &c.,

J. Butler.

"QUANTITIES"—CRITICISM.

Sir,—It is not my intention to criticise the critic, for such would be a game scarce worth the candle; but some of Mr. Edward Reid's assertions are so wild that many besides myself will think they should not be allowed to pass without a challenge. First:—He asserts with coolness that "builders here, a year or two ago, were in the habit of '*cooking*' their tenders." Many Liverpool members of the building trade will be prepared to consider such an unwarrantable and slanderous statement as an insult to men of honour and position. I much doubt if E. R. has at any time been in a position (necessarily confidential) to afford him the means of correctly acquiring such information. Having myself had considerable experience as a builder's clerk, and having for the last dozen years assisted in the preparation of hundreds of tenders, I can confidently affirm that I have never once seen or heard of a case of combination of builders to arrange or otherwise "*cook*" a tender. Of course, I am speaking of the better-class builders; of the small fry I know nothing. Second:—Mr. Edward Hughes's remarks upon joiners graduating as quantity clerks, seems to have seriously troubled Mr. Reid. I have perused a few sets of quantities by so-called practical men, some of which contained many of the identical peculiarities and eccentricities quoted by Mr. Hughes; and there was an absence of system. Only a month ago, an eminent London surveyor was down here, engaged in measuring up an important building; whilst so engaged, he casually remarked that, although he had had 25 years' practical experience in measuring, "he was constantly acquiring additional knowledge in his particular branch." How, then, can it be expected that joiners, masons, and such like, who assume the position of quantity surveyors without having had the necessary training, can, with any degree of success, perform the necessary duties? Further, Mr. Reid asks if builders' foremen are not in the habit of measuring up work for their "employers, and so securing their pound of flesh." Very few do anything of the kind, because they are absolutely unable. I am acquainted with many foremen of all trades; very few of them are able to measure their own trade, and none are able to measure the trade of another.—I am, &c. Thomas Machell.

Liverpool, Sept. 18.

* * *

The Holywell local board decided last week to proceed with the erection of a group of public buildings, including the assembly-room and town hall, board-room, and public offices. Messrs. Scrivener and Sons, of Hanley, from whose designs the new Market-hall was recently erected in Holywell, are the architects.

Intercommunication.

QUESTIONS.

[6238.]—**Weight of Iron Rafters.**—Can any reader favour me with full particulars of the usual method taken by surveyors to ascertain the weight of iron rafters, pilasters, columns, boxes, bolts, &c., from the architect's plans and specifications?—Scotia.

[6239.]—**Tile Roof Gauge.**—I should feel obliged if some of your readers who have had experience in putting on tile roofs would kindly inform me what they consider a safe gauge to put 6¼in. by 10½in. Broseley tiles on a roof having a pitch of 45°.—Plain Tile.

[6240.]—**Books on Building Construction.**—Would someone kindly inform me what are the textbooks usually used in classes on "Building Construction" under the Science and Art Department?—Marsey.

[6241.]—**Ink-Stains on Parchment.**—Can any correspondent inform me how printer's ink (recent) may be discharged from parchment?—W. S. G.

[6242.]—**Good Freestone near Liverpool.**—Would you or any of your correspondents kindly inform me as to quality and colour of good building freestone to be had from quarries near Liverpool, and oblige?—John Comrie.

[6243.]—**Yorkshire Cistercian Abbeys.**—Will some student of Cisterian architecture give me the number of foundations of that Order in Yorkshire? Nineteen is the number given by some works, but I cannot find list of names, and fail to collect traces of them. Name of works or any help on the subject would be of great value to—A Young Architect.

[6244.]—**Material for Concrete.**—I wish to know if lime rubbish, the mortar from walls and plastering of ceilings of houses taken down, without being crushed or ground up fine, would do as a material for concrete when mixed with the usual approved aggregate of Portland cement. Also if very fine sea-sand could be used, as such is cheap and convenient. I see no reference to the former in any work, and the latter appears to be a doubtful question.—Builder.

REPLIES.

[6222.]—**Ancient Lights.**—An answer to this question will be found in the articles on this subject, the first of which appears on page 351.—Ed.

[6223.]—**Mounting Drawings.**—The mode I have adopted is to strain the linen and to paste the mount paper upon it, then strain the whole. The drawing may be best pasted on afterwards. There is no necessity to paste the drawing all over. If the edges are pasted it will suffice, of course, first damping the centre behind. Paste I prefer.—G.

[6226.]—**Architect's Commission.**—An architect can claim a commission of 5 per cent. on the outlay if no agreement has been made to the contrary.—G. H. G.

[6229.]—**Indentures.**—I do not see in what way the cancelling of indentures in your case will affect your future career. Unless indentures are cancelled from neglect or ill-conduct of the pupil, the proceeding cannot injure him, but in case of the retirement of the master, it would be desirable to get the fact shown on the document.—G. H. G.

[6231.]—**Duke of Devonshire's Cottages.**—Plans and particulars of the above cottages were published in the *Agricultural Gazette* of 23rd August last. They would not suit an English labourer.—C. H.

[6231.]—**Duke of Devonshire's Cottages.**—Drawings can be seen of the Duke of Devonshire's cottages in the *Agricultural Gazette*, Monday, August 23rd, 1880.—J. Adkins.

[6232.]—**Sloping Church Floor.**—There are many instances of sloping church floors in which the fall is from the east towards the west. A fall from the west towards the east is more unusual, but occurs at Hingham Church, Norfolk; Bruton Church, Somerset, &c. A list is given in "Notes on Sketching Tours," by Henry Taylor, just published.—J. B.

[6232.]—**Sloping Church-Floor.**—The floor of the parish-church of East Dereham, near Norwich, slopes considerably from the steps under chancel arch to the west door, but how much cannot say. The floor of chancel is level.—M. S. K.

[6234.]—**Architects' Rights.**—(1.) The architect would be responsible for cutting down any work to such a degree as to weaken it or to render it inefficient for its purpose, even if the proprietor desired the tender cut down to meet his requirements. The architect would be responsible for any deficiency in timbering to bear the slates, as he alone should have exercised authority in the matter. (2.) It would not be professional to resign at this stage of the work, and the architect seems bound to carry out a contract in which he is engaged. (3.) I should advise "J. D." to carry on the work, unless further reductions are made by the client's order, which he cannot conscientiously allow. It must be remembered that the architect, as professional adviser of his client, has a right to prevent any work being executed for which he cannot be answerable, and that it would have been more justifiable for him to have resigned at the time the tender was cut down than at the end of the work. If he allows the specification to be reduced, he, of course, becomes responsible for any defective work.—G. H. G.

[6235.]—**Sub-Contracts.**—Is there any written agreement in which the terms of underletting the brickwork are stated? If there is, "Old Subscriber" can certainly enforce compliance or sue for damages. The notice given is the right course to pursue. Take a legal opinion if necessary.—Architect.

[6237.]—**Dividing School-Room.**—Double doors sliding into a cavity on each side of wall, if any exists, would probably be the best mode to adopt. If a partition forms part of the opening of 20ft. it might be constructed of matched boards, hollow, and filled in with loose plaster. Well strained canvas partitions lined with paper would be also a barrier to sound. It is, however, difficult to advise unless more particulars or a plan be seen.—Architectus.

[6237.]—**Dividing School-Room.**—I would advise "Z." to part the room and divide the same by having revolving shutters. I am now adopting this method to a large school in course of erection.—W. C., Bow, E.

LEGAL INTELLIGENCE.

In re William Prebble.—Bankruptcy Court, Sept. 17.—This was a first meeting. The bankrupt was a builder and contractor, carrying on business in Rifle-street, Poplar, under the firm of Sheffield and Prebble. He had filed a petition for liquidation, but the proceedings fell to the ground, and an adjudication followed. The liabilities were returned at £15,048, and debts fully secured £7,024; assets, £1,266, after providing for preferential claims. Numerous proofs were admitted, and the creditors appointed Mr. Thomas Masson, accountant, Leadenhall-street, as trustee, together with a committee of inspection.

Alleged Nuisance from Brick-Burning.—Rachel Jackson, the owner of a brickyard in Park-lane, Stockport, was summoned to the Stockport Police-court, on Saturday, under the provisions of section 114 of the Public Health Act, 1875. Complaint having been made by a resident near defendant's brickyard, the medical officer of health certified that the smoke from the burning of bricks was a nuisance injurious to health, and the Sanitary Committee were obliged, therefore, to order these proceedings. In support of his certificate the medical officer produced a piece of glass taken from a window of one of the adjacent houses, and which had been rendered opaque by the gases thrown off from the burning bricks. It appeared that the kiln was within about 20ft. of one of the houses. The defendant gave an undertaking that any future kilns should be erected at a further distance from the houses, and the case was adjourned for a month to give her an opportunity of carrying out the undertaking.

Charge of Fraud against a Builder.—At the Central Criminal Court, on Tuesday, Henry Capsey surrendered to take his trial for having unlawfully incurred a debt and liability to the amount of £200, and also with obtaining the same money from a solicitor, named Parkes, by fraud. The charge was framed under the Debtors' Act of 1869. Mr. Besley and Mr. Grain prosecuted, and Mr. Montagu Williams appeared for the defendant. This case was a rather peculiar one. The defendant carried on business as a builder at Stoke Newington, and he had built two houses at that place, on which Mr. Parkes, the solicitor to the freeholder, had advanced some money, and the defendant had deposited the leases upon these houses with Mr. Parkes as security. A further sum of money was to be advanced, and Mr. Parkes had prepared the necessary documents to secure the advance, but it appeared that the defendant had induced the managing clerk of Mr. Parkes to give him up the leases; but Mr. Parkes, being ignorant of this gave the defendant a cheque for £150, believing that the securities were still in his possession. To his surprise, however, when he looked for the leases, he discovered that they had vanished, and he was left without any security whatever for the money he had advanced to the defendant, who, it appeared, had subsequently deposited the leases with his bankers as security for advances they had made to him.—The defendant pleaded guilty to that portion of the indictment which charged him with unlawfully incurring a debt without the means of paying the same.—Mr. Montagu Williams, in behalf of the defendant, urged that the transaction partook of the nature of a civil than a criminal proceeding, and the defendant was willing to repay the money that he had obtained from Mr. Parkes. He asked that judgment should be postponed till the next session, and said that during the interval some satisfactory arrangement would be made.—The Common Serjeant consented to this, and the defendant was discharged upon bail to come up next session for judgment.

WATER SUPPLY AND SANITARY MATTERS.

Edinburgh.—On Tuesday the Edinburgh and District Water Trustees visited the site of the proposed Rosebery Compensation Reservoir on the South Esk, required for the completion of the Moorfoot Water Scheme, as originally laid out by Mr. Leslie. This reservoir it is proposed to construct about two miles below Gladhouse, and the effect of its completion would be to take in to the supply district an additional area of about 1,620 acres, chiefly arable, and partly moorland, the water of which at present—estimated at 2,025,000 gallons per day—drains into the South Esk by several small burns. The river here runs through a gorge, across the north end of which would be thrown an embankment, 80 or 90ft. in height, and about 200 yards in length. In the centre of this would be the usual water-tight core, carried down to the impervious rock which exists in the bottom of the valley. The hills on each side would form the sides of the reservoir, and these also would be made watertight by puddle trenches. The embankment would thus dam back the river for nearly three-quarters of a mile, and form a reservoir with a storage capacity of 381,250,000 gallons, and this would be entirely devoted to compensation purposes, obviating the necessity for sending down from Gladhouse compensation water to the amount of 1,350,000 gallons per day. But in Rosebery, also, the water of the Black Burn, which runs at present useless to the sea, could be impounded, so that over 2,000,000 gallons of water per day could be added to the town's supply. The land for the reservoir has already been purchased; its construction, it is estimated, would cost £42,700. As the Moorfoot works, completed, or in course of construction, have cost £375,976, this would mean that for an additional 10 per cent. of outlay the supply of water from this district could be increased 30 per cent. Edgelaw reservoir, on the Fullerton Burn, has now been completed, and about sixteen feet of water collected in it. This has been constructed in the same manner as it is proposed should be done at Rosebery—a large embankment having been thrown across the course of the burn, and the valley in which it runs turned thereby into a large pond, capable of holding 250,000,000 gallons of water. The works have cost £30,000. When the Edgelaw reservoir, which will likewise be used solely for compensation purposes, is in full operation, a further saving of 1,506,875 gallons per day of Gladhouse water will ensue. Both together, the Edgelaw and Rosebery reservoirs would place at the disposal of the trustees an additional supply of water equal to twelve gallons per head per day to a population of 300,000.

Leeds.—The members of the Leeds Town Council paid an official visit to the Sewage Purification Works at Knostrop on Wednesday week, under the guidance of the Mayor and Mr. Morant, the borough engineer. They were conducted first to the outlet into the river Aire of the clarified sewage water. The effluent is generally much clearer than the water in the river; but, in times of heavy rain, such as during the last few days, the sewers have a greater outflow than the purification works can deal with, and, as was the case during the visit, the surplus water is allowed to pass on into the river. At the works the party saw the whole process of purification so far as it has been carried on for a considerable time. It has been carefully calculated that in dry weather about 10,000,000 gallons of sewage water passes through the works every 24 hours, but this week the quantity has increased to fifteen and seventeen millions of gallons. Lime only is used for the purpose of purifying or clarifying the sewage water, one ton being used for every million gallons, and this produces an effluent sufficiently clear to meet the requirements of the injunction. The work, including the pumping, has been carried on at a cost of somewhat over £5,000 per annum, whereas the cost at one time amounted to £14,000. The utilisation of the sludge remaining after purification is still the great difficulty.

Luton.—This town, which is in the Lea Conservancy district, has for many years satisfactorily managed its sewage by means of a lime process, but the rapid growth of the population has necessitated enlarged operations. Continuing the mixing with lime and deposit tanks, a process of filtration of the sewage effluent will be adopted. On a small scale, it has been tried for several weeks with success, the water, after passing through some four feet of earth, coming out pellucid, and leaving no deposit on the banks of the Lea, into which it runs. The Local Government Board sanctioned a loan of £4,000 for the extension of the works, and new land has been acquired, making in all about 24 acres. Of this at present it is intended to use only five acres.

* * *

A large folio volume, containing the original drawings by John Carter for the plates of his well-known work, entitled "The Ancient Architecture of England," published in 1795, has lately been purchased for the Manuscript Department of the British Museum.

The city of Cremona, last week, suffered a great loss, by the total destruction by fire of the large building which had been erected on the Piazza di Roma to serve for an industrial and art exhibition. The violence of the fire was so great that, within an hour, nothing remained but the iron pillars supporting the floor. Some of the objects which have been placed in the building were saved, but very many were destroyed.

The burial board of Derby affixed, last week, their seal to a contract with Mr. Harpur, of that town, for carrying out the works necessary for the enlargement of Nottingham-road cemetery,

Our Office Table.

Mr. J. H. Parker, C.B., has written to the *Times*, contradicting the apparently official statement published in our last issue (p. 326) as to the practical extinction of the Archæological Society of Rome. True, the rooms have been changed, and no meetings were held last session before March, but the officers were re-elected at the annual meeting in April, and the present members do not at all think it probable that the Society will become extinct. Referring to the invitations he has received from members of the society to revisit Rome, the veteran archæologist says:—"I would gladly do so, but my doctor says emphatically that if I wish to prolong my days upon earth I must remain quiet in Oxford. He also specially cautions me against railway travelling, and I feel that he is right. In my 74th year I am not equal to the fatigue and the worry which experience tells me that I must go through in Rome in consequence of the endless succession of persons wanting the same information."

In laying the foundation-stone of an addition to an Established Church at Ballachulish, near the entrance to Glencoe from Loch Leven, last week, the Duke of Argyll remarked that he had been lately visiting the old ecclesiastical sites so common in Scotland, and he was struck with the fact that the ruins of the little chapels which remained exhibited an eye for proportion which they did not find in the architecture of the present day. Very often these remains were of a very simple character—rectangular buildings of very modest proportions, evidently calculated to hold a very small number of people. They were almost all on most picturesque sites. They had generally the scale of beautiful proportion which could not be mistaken by those who had studied the simplest architecture of the middle ages. He wished their architects of the present day had an eye for that proportion. They seemed to desire to eke out the ornamentation of the church by elaborate windows, whilst the general proportion of the building was deficient to the eye.

A correspondent of the *Times*, in describing a recent ascent of the central tower of Canterbury Cathedral, complains of the filthy and uncared-for condition of the two turrets by which respectively he was conducted up and down. He says the winding stairs are rendered dangerous by a great accumulation of dry twigs and rubbish brought in by the jays and other birds as nest materials, who gain access by the air-holes left in the walls. These masses of dry vegetable débris not only form a continuous yielding slope difficult of ascent to the occasional visitor, but involve a serious peril of accidental fire. The true safeguard against fire would, the writer says, be not to enforce the present prohibition to mount to the platform of the tower more stringently—a prohibition, he admits, he evaded without the consent of the Dean and Chapter, by the application of what he euphemistically styles a silver key—but to cleanse the turrets and throw them open to visitors under responsible guardians.

"A Sanitary Plumber" writes in the *Daily Telegraph*:—"I shall not be far from the mark when I assert that most of the houses being built in the suburbs of London would be condemned by any competent surveyor. Untrapped drains, the worse than useless bell-traps, unventilated soil pipes—or, where ventilated, so constructed as to deliver sewer-gases into the windows of the upper rooms—are to be found in many of the new streets, terraces, and rows of villas. This state of things is not so much the fault of the workmen engaged in the construction as in the system. I could furnish hundreds of instances quite as glaring as those given by Mr. Flower, and many of them carried out under the directions of architects and surveyors. Our various local boards have much to answer for in the past and present, in not having instituted a proper supervision of the sanitary arrangements of the houses 'run up' in their respective districts." "Sanitas" observes:—"My house, which would be described by an energetic house-agent as a 'charming villa residence, situate in a pleasant and healthy locality,' might be included in the list of 'whited sepulchres.' I had not occupied it long before the usual indications of defective drainage made themselves apparent. Smells day and night—sometimes almost too atrocious to be endured, at others hardly perceptible, resulting in more or less illness amongst the children, and more particularly amongst the servants." Having explained how this state of things arose, our correspondent adds—"The present system of calling in the medical officer or sanitary inspector appears to me to be utterly useless. What I should suggest would be the appointment of sanitary engineers, whose duty it would be to have submitted for their approval the plan of every house, large or small—that is, the plan of the drainage—and upon their being satisfied that the system was good, and had been thoroughly carried out, to give a certificate of licence to the owner to that effect. Any man building or letting an uncertificated house should be prosecuted and punished as severely as the circumstances warranted. The letting of unhealthy dwellings is only one of the many forms of manslaughter which go unpunished. Let the next session see a short Bill introduced for the 'better protection of the health of the people,' and the greatest gratitude would be due to its promoters."

Last week, in describing the second fresco executed by Mr. Ford Madox Brown in the new town-hall, Manchester, we remarked, as an instance of the attention paid to archæological details in the "Building of Mancunium" that the legion whose name is inscribed on a sack (Leg. vi. Victricis) was the one for whose stay in Manchester there is positive epigraphic evidence. Mr. W. Thompson Watkin, of Liverpool, who has contributed papers on "Roman Manchester" to the Transactions of the Historic Society of Lancashire and Cheshire, writes, pointing out that although it is known that the Sixth Legion were in Manchester, there is undisputable evidence that the Twentieth Legion preceded them by nearly sixty years, and a strong presumption, if no more, that this legion built the castrum of Mancunium. He concludes by saying:—"I think it may with certainty be accepted as a fact that Mancunium was built between the accession of Vespasian, A.D. 69, and the death of Domitian, A.D. 96, and consequently fully a quarter of a century before the arrival of the Sixth Legion on the shores of Great Britain."

CHIPS.

The second annual fine art exhibition, held at the rooms of the Working Men's College, in Upper Kennington-lane, S.E., has just been brought to a close. The financial results have been unsatisfactory, the expenses having been £50, and the receipts, in small donations, only £2.

The tender of Mr. Biscomb, builder, of York, has been accepted for the carrying out of alterations of the south side of York Castle as determined upon by the county magistrates. The works, which will be made after designs by Mr. Fisher, architect, of York, and are estimated to cost between £3,000 and £4,000, will consist of the provision of additional accommodation for the waiting witnesses, improvements of the refreshment-room, the ladies' gallery, &c.

The improvement commissioners of West Bromwich, at a special meeting held on Wednesday week, approved a scheme for the drainage of the town prepared by their surveyor, Mr. J. J. Eayrs, C.E. The sewage and drainage will be dealt with on the separate plan, and the former will be treated by intermittent downward filtration, on land to be acquired for the purpose near Bescot Station. The estimated cost of the scheme is £54,726 12s.

A rearing-supper, to celebrate the additions now being made to Greenfield, Thelwall, near Warrington, the future residence of Mr. Henry Stanton, J.P., was held on Friday evening. The alterations consist chiefly of the addition of a new drawing-room, morning-room, garden-hall, billiard-room, boudoir, and an entirely new range of kitchen offices, together with servants' sleeping-rooms. The work throughout is being executed under the personal direction of the architect, Mr. William Owen, of Warrington. The builders and contractors are Messrs. Gibson and Son; and the sub-contractors for stonework, Mr. Gittens, Orford-street; for plumbing, Mr. Leigh, of Lymm; plastering, Mr. James Hinde, Greenall-street; gas-fitting, Mr. Mason, Irlam-street; bellhanging, Mr. Jefferson, Market-street. The clerk of the works is Mr. S. P. Silcock, one of Mr. Owen's office staff.

The tender of Mr. William Cordon, of Nottingham, amounting to £6,680, was accepted, on the 13th inst., for the execution of sewerage works for the local board of Arnold, near Nottingham.

A new fustian factory is being built at Over, Cheshire, on the site of one burnt down a few years since. Mr. Worrall, of Congleton, is the contractor; the building will occupy an area of 300ft. by 500ft.

The death is announced, at the early age of 44, of Mr. John Templeton Lucas, an exhibitor at the Royal Academy and the Society of British Artists. He was the eldest son of the late John Lucas, the portrait-painter.

It is proposed to construct a line of street tramways through Gravesend and Rosherville to Northfleet; Messrs. Russ and Minns, of Westminster, are the engineers.

A quaint letter has just come to light from amongst the papers in the office of a professional gentleman in Woodbridge, and when it is stated that there is a coloured plan (very clearly and carefully done) attached to the letter, it will appear that Mr. Elliott, whoever or whatever he might have been, was singularly "moderate in his charges." The letter is as follows:—"Sir,—The contents of the four pieces of glebe meadow land lying to the westward of the Key in Woodbridge, in the occupation of Mr. Norfield, is, according to the mensuration as underneath severally described. Sir, according to your desire, I send you an account of my expense of the Inn, which is a shilling, and likewise the charge of the measuring the land, which is eighteenpence. Sir, I am your obliged humble servant, Jno. Elliott."

A new esplanade on the West Bay at Dunoon, N.B., was opened on Saturday. It has been constructed, under contract, by Mr. Cunningham, of Kilbarchan.

A cargo of fifty-seven tons of Greek marble has this week been delivered in London, free of all charges, by the Greek Government, for the pedestal of the Byron monument.

A commencement has been made in the carrying out of the long-contemplated covering in of the wholesale vegetable market at Newcastle-on-Tyne. The work is being executed from the designs of Mr. A. M. Fowler, M.I.C.E., the borough engineer, and consists of a double-spanned iron and glass roof, supported on three rows of eight iron columns, set on stone bases. The contractor is Mr. Jackson, who recently built the grain warehouse on the Quay side.

A handsome stained-glass window has recently been placed in the west end of Holy Trinity Church, Coventry, in memory of the late Mr. W. Chater, organist of the church. The window, which is a four-light one, illustrates Christ's teachings in the two great commandments, "Duty towards God and duty towards your neighbour." The window was designed and executed by Messrs. Heaton, Butler, and Bayne, of Garrick-street, London.

The state saloons of the Imperial Russian yacht *Livadia* have been fitted with a novel adaptation of the French casement fastening supplied by Mr. E. E. Pither, of 4, Newgate-street. It is of special design, the handles and fittings being of chased brass, and the rod japanned, to harmonise with the prevailing tone of the decoration.

The very extensive churchyard attached to the parish-church of St. John, Friar-street, Horselydown, is being converted into a public garden for the benefit of the parishioners, and will be thrown open early in the coming year. The grounds possess an historic interest, occupying as they do the site of the old artillery grounds, where the famous Southwark Train-Bands used to exercise. They are shaded on three sides by large ash and lime-trees, and the churchyard itself is studded with beautiful clumps of lilac, laburnum, mountain ash, and other flowering trees.

At a meeting of the Paignton Local Board on Monday one of the members of the Board stated that he had visited the works of the Paignton Water Company, and had found that at present the water supplied to the town ran through a duck-pond on the farm of Mr. Daniel Hext. The pond received not only the drainage of Mr. Hext's yard, but also the sewage of his house. Other members of the Board having corroborated these statements, it was decided that the works should be inspected by the Water Committee pending negotiations for the transfer of the works to the Board.

Cardinal Manning laid on Tuesday the foundation stone of a new Roman Catholic Church, at Nottingham. The building will be in the Early English style, and is to cost £5,600.

A number of designs have been submitted by sculptors for the proposed bronze statue of Sir Rowland Hill, to be erected at the rear of the Royal Exchange, facing Cornhill.

Extensive alterations and improvements have just been carried out in the National Training School for Cookery at South Kensington, under the supervision of Sir Daniel Cooper.

A new system of water-supply is in course of construction at Dawlish, from the plans, and under the superintendence, of Mr. Edward Ellis, C.E., of Exeter.

A new U.P. church was opened at Selkirk on Thursday week. It has been built from designs furnished by Mr. R. Baldie, architect, Glasgow, and is situated in Dovecot-park. The style of architecture is Early Gothic, and there is a spire 130ft. high. Attached there is a hall for Sunday-school and other meetings, and several other rooms. Inside, the woodwork of church is of pitch-pine. A gallery is carried round three sides, the pulpit occupying the fourth. The building will cost about £5,000, and will accommodate 870 sitters.

The parish-church of Swymbridge was reopened on Tuesday after complete restoration, from the designs of Mr. J. L. Pearson, R.A., of London, and at a cost of £2,600. Mr. Jonathan Marshall, of Plymouth, was the contractor. Mr. C. Pickard, Barnstaple, executed the carving, with the exception of the stalls in the chancel, which are the work of Mr. Robinson, of London.

A subscription is on foot to place an altar-tomb in Salisbury Cathedral, as a memorial to the late Bishop Hamilton. Upwards of £800 has been raised privately, and another £100 is required.

A memorial-fountain is about to be placed in Elswick-park, Newcastle-on-Tyne. Mr. Craggs is the sculptor.

The Theatre Royal, Sheffield, which has been re-constructed from the designs of Mr. C. J. Phipps, F.S.A., at a cost of £8,000, will be reopened on November 1st.

◆

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill *Use no substitute* —[Advt.]

Holloway's Ointment and Pills afford comfort, security, and ofttimes recovery to the most tortured sufferers. This ointment, when properly used, will cure all descriptions of sores, wounds and bad legs, sprains, erysipelas, rheumatism, gout, and skin diseases. The Pills are infallible in biliary and digestive derangements, sick head-ache, and constipation.

◆

Trade News.

◆

WAGES MOVEMENTS.

A strike has occurred amongst the Paris cabinet-makers, 2,000 of whom have ceased work. The men demand 8d. per hour wages, and refuse to work more than 10 hours daily.

Edinburgh.—The plasterers employed at the University new buildings gave notice to Messrs. Stuart and Co.'s manager, on Friday afternoon, that they demanded ½d. more per hour, and before the manager had time to communicate the fact to the firm the men left the buildings in a body. Their places were filled up on Saturday by men willing to work at the existing rates of pay.

◆

"THE BEST PENS INVENTED."—*Argus.*
Sold at 6d. and 1s. per box, by all Stationers.
"They come as a boon and a blessing to men,
The Pickwick, the Owl, and the Waverley Pen.
Sample box of all the kinds by post 1s. 1d.
Just out. The HINDOO Pens Nos. 1, 2, 3,—*diagonal points.*
MACNIVEN and CAMERON, 23 to 33, Blair-street, Edinburgh.
Penmakers to Her Majesty's Government Offices. Estd, 1770.—[Advt.]

◆

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[Advt.]

◆

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[Advt.]

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BOX GROUND STONE
Is the Best for Use in all Exposed Positions, being Well-known and Tried Weather Stone.
50,000 Feet Cube in Stock.
PICTOR & SONS,
BOX, WILTS.
[Advt.]

◆

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Annan.—For the supply of pipes for the waterworks, for the Annan police commissioners :—

Laidlaw, R. and Son, Glasgow (accepted)...	£3,903 14 11

Abingdon.—For the restoration of St. Nicholas Church, Abingdon. Mr. Edwin Dalby, architect :—

	Estimate No. 1.	Est. No. 2.	Total.
Groves ...	£2,096 0 0	£470 0 0	£2,566 0 0
Kingerlee	1,790 0 0	494 13 6	2,284 13 6
Allen ...	1,695 0 0	540 0 0	2,235 0 0
Selby ...	1,720 0 0	443 0 0	2,163 0 0
Claridge	1,710 0 0	435 0 0	2,145 0 0
Jones ...	1,410 0 0	488 0 0	1,898 0 0
Wheeler	1,433 0 0	426 2 6	1,857 2 6
Williams*	1,477 0 0	379 0 0	1,856 0 0
King ...	1,386 0 0	406 0 0	1,792 0 0
Holland	1,399 0 0	335 0 0	1,734 0 0

* Accepted.

Arnold Local Board of Health.—For sewerage works :—

Cook and Bennett, Spalding	£9,972 0 0
Bell, Jno., London ...	9 181 0 0
Pearson, J., Hull ...	9,110 11 7
Smith, Peter, Manchester	9,043 12 0
McKenzie and Co., London	8,600 0 0
Coupe, Jno., Ripley	8,306 0 0
Rushworth, Jno., Nottingham ...	8,299 7 8
Dawson, Frank, Bury	8,169 0 0
Thimbs, S., Nottingham ...	7,950 0 0
Knight, J., Loughborough	7,875 15 7
Greaves, Jno., Arnold	7,798 10 9
Tomlinson, Messrs, Derby	7,700 0 0
Meats Bros., Nottingham	7,538 2 4
Johnson, A., jun., Derby	7,533 5 8
Dobb and Gummer, Rotherham ...	7,347 0 0
Jeffries, R., Conway	6,967 5 4½
Smart, Thos., Nottingham	6,924 0 0
Dovenor and Quesnell, Stoke-on-Trent	6,871 1 0
Cordon, Wm., Nottingham*	6,680 0 0
Wayte, A., Arnold	6,400 0 0

* Accepted.

Ashton-in-Markenfield.—For the erection of new purifiers and condenser at the gasworks, for the local board. Mr. W. Gouldsworth, surveyor :—

	Purifiers.	Condenser.
Whitfield, J., Wigan (accepted)	£220 10 0	£117 10 0

[Fourteen tenders received.]

Bermondsey.—For the erection of three new houses adjoining (one with gateway), and a new warehouse at rear of, No. 140, Abbey-street, Bermondsey, and the conversion of present house (No. 140) into two smaller houses, for Wm. Wilkins, Esq. Mr. E. Crosse, architect, 6, Bermondsey-square. Quantities supplied :—

	First item. The 3 new houses.	Second item. The warehouse.	Third item. The old house.	Total.
Friggens...	£2,008 9 2	£542 10 9	£577 15 7	£3,128 15 6
Preston (too late)	1,741 10 0	628 0 0	675 10 0	3,045 0 0
Almond ...	1,776 0 0	643 0 0	589 0 0	3,008 0 0
Eldridge and Gee	1,747 7 0	624 0 0	618 13 0	2,990 0 0
Kipps ...	1,928 3 8	554 15 3	505 14 4	2,988 13 3
Bullers ...	1,668 0 0	635 10 0	581 10 0	2,885 0 0
Wells ...	1,734 0 0	510 0 0	541 0 0	2,785 0 0
Rider and Son ...	1,650 0 0	553 0 0	540 0 0	2,743 0 0
Croaker ...	1,628 0 0	570 0 0	525 0 0	2,723 0 0
Greenwood	1.628 0 0	552 0 0	529 5 0	2,709 0 0
Downs and Son	1,560 0 0	586 0 0	490 0 0	2,636 0 0
Tarrant and Son	1.594 0 0	521 0 0	521 0 0	2,636 0 0
Batley ...	1,577 0 0	532 0 0	381 0 0	2,490 0 0
Winson*...	1,578 18 0	459 18 0	376 0 0	2,414 16 0
Brockwell	1,035 0 0	484 0 0	374 0 0	1,893 0 0
Architect's estimate ...	1,566 19 11	506 11 1	416 3 7	2,489 14 7

* Accepted as to items 2 and 3, deferred as to item 1.

Brighton.—For alterations and additions to Brighton New Club, King's-road, Brighton, Sussex. Mr. Thos. Lainson, architect. Quantities by Messrs. Fowler and Hugman :—

Nurcombe, J....	£6,014 16 6
Kirk and Randall	5,865 0 0
Jones, D. C. ...	5,660 0 0
Barnes, J.	5,640 0 0
Lockyer, G. R.	5,630 0 0
Cheeseman, G. and Co.	5,560 0 0

Burntisland, N.B.—For strengthening the pier walls, for the harbour board :—

Penny, P., Burntisland (accepted)...	£324 19 0

City, E.C.—For rebuilding warehouses, 31, Houndsditch, and Duke-street, for Messrs. Samuels and Co. Mr. H. H. Collins, architect :—

Sparks ...	£6,205 0 0
Ashby and Horner ...	6,170 0 0
Marks	6,026 0 0
Conder	5,938 0 0
King and Son...	5,882 0 0
Kirk and Randall	5,846 0 0
Outhwaite	5,800 0 0
Colls and Sons	5,760 0 0
Downs ...	5,675 0 0
Croaker	5,585 0 0
Merritt and Ashby	5,550 0 0
Sabey and Son	5,495 0 0
Bentley	5,430 0 0
Abraham	5,384 0 0

Chelsea.—For rebuilding No. 8, King's-road, Chelsea, S.W., for Mr. R. W. Livingstone. Mr. Geo. Fagg, architect. Quantities supplied :—

Thorne ...	£2,100 0 0
Hare and Son	1,998 0 0
Lathey Bros.	1,973 0 0
Macey and Sons	1 962 0 0
Clark and Bracey	1,832 0 0
Smith, G. T. ...	1,795 0 0
Richardson	1,779 0 0
Craske ...	1,730 0 0

Dalston.—For cleaning, repairs, and decorations, Dalston Chapel ;—

Goodman	£525 0 0
Snook	419 0 0
Campion ...	398 0 0
Jarvis and Son ...	300 0 0
Shurmur...	279 0 0
Barber and Co. (accepted)	238 0 0

Devizes.—For the erection of new town schools for girls, cooking school, and third-grade school. Mr. Henry Weaver, architect. Quantities supplied :—

Light and Smith, Chippenham ... (too late)	£1,187 0 0
Long, W. and F., Bradford-on-Avon	1,150 0 0
Chivers and Son, Devizes	1,095 0 0
Ash, H., Devizes.	1,091 0 0
Webb and Powney, Bromham*...	1,020 0 0

* Accepted.

Hurlingham.—For erecting smoking-saloon and enlarging Polo Pavilion, decorating dining-room and saloon at Hurlingham, for the committee of the Hurlingham Club, Fulham. Mr. Joseph S. Moye, architect :—
Saala, H. (accepted).

Kettering.—For new stores, cottages, &c., in King-street, for the Co-operative Society ;—

Brickwork :—	
Henson, C. and F. (accepted)	£967 6 6
Woodwork :—	
Ginns, G. (accepted) ...	406 1 3
Plumbing and glazing :—	
Dorr, F. (accepted) ...	130 0 0

London.—For sundry works at offices, City of London Union, Bartholomew-close :—

Ayres	£690 0 0
Larke and Son ...	663 0 0
Healing ...	645 0 0
Staines and Son	644 0 0
Shorey, G.	610 0 0
Thomas. W.	610 0 0
Howard ...	587 0 0
Weekes and Son	579 0 0
Merritt and Ashby	575 0 0
Jones, R. T.	567 15 0
Pitman and Son	555 0 0
Phillps and Son	553 0 0
Conder ...	551 0 0
Shurmur ...	549 0 0
Sawyer ...	540 0 0
Coombe ...	529 0 0
Johnson and Co.	525 17 6
Ball and Wickes	522 15 8
Marsland	518 0 0
Patten ...	500 0 0
Lamb, G...	490 0 0
Benson ...	488 0 0
Barker ...	483 0 0
Derby ...	474 0 0
Taylor and Son...	463 0 0
Robb	450 0 0
Wadsworth	450 0 0
Bulford ...	418 8 5
Vigor, F. G. and R.	415 0 0
Prescott ...	410 0 0
Spencer and Co...	409 0 0
Grimshaw	383 0 0
Fernley, J. H. ...	375 0 0
Lewis	374 11 6
Cocks, J. H.	357 0 9
Powell and Co....	350 10 0
Pitman and McCarthy	290 0 0

London.—For the new Leadenhall Market :—

Martin, Wells, and Co. ...	£58,256 0 0
Crocket	57,200 0 0
Garlick	56,600 0 0
Shurmur	55 980 0 0
Webster	55,000 0 0
Shaw ...	53.500 0 0
Conder	52,214 0 0
Gaund	52,033 0 0
Bull, Southampton	51,637 0 0
Mowlem and Co.	50,950 0 0
Drake...	50,650 0 0
Bangs and Co.	49,995 0 0
Trollope and Son	49,877 0 0
Perry and Co.	49 776 0 0
Holland	49,734 0 0
Morter	49,493 0 0
Vernon and Ewins...	48,240 0 0
Deelin...	48,148 0 0
Nightingale (accepted)	47,518 0 0
Green and Burleigh	47,140 0 0
Crabb...	46,990 0 0

London.—For new school buildings for the parish of St. Clement Danes (exclusive of fittings). Mr. C. W. Reeves, architect, 102, Guilford-street, Russell-square :—

Wagstaff and Son	£3,157 0 0
Wall, C.	3,150 0 0
Hobson, J. D...	3,037 0 0
Macey and Son	2,948 0 0
Howard and Dorrell	2,947 0 0
Scrivener and Co. (accepted)	2,919 0 0

London.—For the erection of offices, &c., for Mr. G. H. Powell, at 35 and 36, Lime-street, London, E.C. Mr. Edward Sharman, Wellingborough, architect. Quantities supplied :—

Carter, J and Co., Lime-street ...	£5,600 0 0
Underwood, J., Wellingborough...	4,885 0 0
Williams, G. J. and Son, Islington	4,446 0 0
Greenwood, J. J., Tooley-street...	4,300 0 0
Roberts, L. and R., Islington* ...	4,189 0 0

* Accepted.

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 1, 1880.

COMPETITIONS FROM THE CLIENT'S POINT OF VIEW.

IT is not surprising that competitors and promoters of competitions rarely agree; for it generally happens that they have two quite different conceptions of the business in hand. To the architect—and especially to the very young architect—a competition is, or, as he thinks, ought to be, a game of skill played according to certain strict rules. The clients make the rules: the competitors ought rigidly to observe them, and he who does best without infringing them should have the reward. This, no doubt, would be a very good summary of what ought to happen if the competition were instituted by some public body, such as the Royal Academy, for the purpose of testing the relative ability of so many candidates. Let them all work at the same problem, under the same precise conditions, and in the issue some sort of judgment can be formed of their relative power to deal with problems of that particular class. The mistake which too many architects make with regard to public competitions is that of looking on them as if they had this end in view. It is tacitly assumed that the Town Council of A., or the Vestry of B., when they advertise for designs, have nothing so near to their hearts as the winnowing of the wheat from the chaff of the architectural profession. Fired with this noble impulse, they offer a number of rewards to merit, and lay down a series of rules for the guidance of those who seek to be rewarded. To break the rules, or any of them, is not only perilous but dishonourable. It is a cheating of your fellow-competitors, and a clutching at the prize while you evade the difficulties of the task. If the rule-makers say they shall allow only ten thousand pounds for a building such as elsewhere costs fifteen thousand, you are bound in honour to do the best you can with the ten. If they insist on a stone building when they have only money enough for a brick one, you must design a stone one, and let them take the blame of its looking poverty-stricken. If they allow too little land when they have the power of giving more, you must crowd your plan accordingly, and not mind spoiling it. If they desire a particular form of building, as they sometimes do, you must adopt this form, no matter how many better forms may occur to you; and the same principles which guide you as to the design must guide you as to the drawings. The promoters, it may be, thought to save competitors trouble, or themselves disappointment, by having all elevations in outline unshaded; therefore, though part of your elevation may stand 20ft. back or forward from the rest, you must not put a particle of shadow to indicate this. They prohibited perspectives, and, therefore, you must not send the slightest sketch which will guide them as to the real appearance of the building if erected. You must follow their instructions as if they were the result of the profoundest study of every aspect of the subject, instead of being, as they usually are, a vague statement of wants by people who, as yet, do not half-know what they really do want.

This is the view commonly taken of competition rules by some of the competitors; and when they fail, as they are only too apt to do, they often complain in unmeasured terms of the unfairness of the other competitors and of the judges. If the competition were instituted for the mere purpose of ascertaining the relative merits of the competing architects, these complaints would clearly be reasonable; and it never seems to dawn on their authors that it was not so. In reality, however, this is the last thing which ever troubled the promoters. Nothing was further from their intention than to start a sort of voluntary examination of architects as a body; they neither assumed the ability to conduct it nor framed their rules for the purpose of conducting it fairly. What they had in view was something totally different. Their rules were made with quite another purpose from that which competitors are apt to take for granted; and in nine cases out of ten no one would so much regret a too rigid adherence to those rules than the very people who framed them. Take the case of a committee inviting designs for some public building. They know little of architecture, and less of its individual practitioners. To them an architect is an architect, just as to multitudes of people a doctor is a doctor; and they suppose one architect to be about as good as another. This being so, they consider that the fairest thing for the architects and the safest thing for themselves is to let everybody compete who will. The next point is to settle the rules of the competition. Three-fourths of the committee probably never saw, and scarcely ever heard of, a competition before. They are in the position of a man who, never having seen a chessboard in his life, should be made umpire at a great chess tournament. Still, as Dr. Johnson said, "What must be done will be done," and they bravely launch out into the unknown. First, perhaps, they settle the accommodation required. Almost every member of the committee has something to say about it, and some room or corridor, or staircase to add, for the benefit of the department he happens to be personally interested in. All these little additions mount up to a good deal when put together; but in the mean time the site will not expand itself to hold them; and the money originally talked of is likely rather to be lessened than increased. For when the next item, the cost, comes to be talked of, everybody is unanimous that architects' estimates are generally exceeded, and the natural remedy that suggests itself is, to make a condition that the work shall be done for so many thousand pounds less than the committee are really prepared to pay. If the chosen architect can do it for the smaller sum, so much the better; if not, his infringement of the rules will be a good excuse for cutting down his commission, and treating him shabbily in any other way that may suggest itself. Then comes the question of site. In many cases, this of course is settled by circumstances: but even when it is otherwise, it often happens that the area allowed is decided on by the same principles as those on which the cost is specified; and that less space is given than it is easy to foresee will be wanted. The "conditions of competition" have thus been settled as to three main points: the accommodation, the cost, and the area of the site. But two most important questions evidently arise at this stage: and they are two questions which hardly any competition committee ever attempts to answer. If the specified accommodation cannot be had for the specified cost, is the accommodation to be reduced, or is the cost to be increased? And again: If the specified accommodation cannot be got on the site provided, is the accommodation to be cut down, or the area added to? If architects would get clear answers to these two questions at the outset, much of the undignified wrangling which forms the last scene of almost every large competition, would be finally suppressed. But the questions can hardly be asked by any individual architect; he would be instantly marked as leaning towards extravagance both in ground and money. To ask such questions is the business of societies representing either the whole profession or large local sections of it; and the more ready they are to do their business in this and similar directions, the more hearty support they are likely to meet with.

If the committee stopped here, and made no conditions beyond the three just noticed, their rules would be hard enough to conform to; but very few committees have the wisdom to stop so soon. They proceed to the mysteries of scales; and though it is desirable enough that the scale should be uniform for all designs, we sometimes see some strange conditions even here. Only a few years ago, an advertisement appeared in the BUILDING NEWS, amongst other papers, inviting designs for a union workhouse, and requiring all the plans to be made to a scale of one inch to a foot. Things like this, however, are trifles, and can easily be set right by letters from one or two intending competitors. But other conditions are often met with which are by no means trifles. The committee, or some of them, have probably seen some other building of the same kind as their own, which they much admire. Whether their site will fit it, whether their surroundings will suit it, whether their specified accommodation can be got into it, are matters that never trouble them. They think (till their eyes are opened by rule-breaking competitors) that they have found the best possible model, and they are anxious to get something as much like it as may be. So they go on, and specify the style of the model as the style in which all designs are to be composed: and sometimes even its plan, as the plan which all architects are to follow. The competitors were tied hand and foot, it might be thought, by the first three conditions; but their taskmasters seem bent on tethering them by as many strings as bound down Gulliver in Lilliput. Fortunately for our architecture, some of our modern Gullivers carry a penknife about them, and, in defiance of all propriety, sometimes cut the strings, when they are pulled tighter than flesh and blood can bear.

Accommodation, cost, area, style, and perhaps plan, being all settled, the committee lastly feel bound to lay down rules about drawing and colouring. They have heard that the non-professional mind is in danger of being imposed on by highly-coloured views; hence they decide to have no views at all. As to the immense difficulty which even an accomplished architect finds in judging of a complicated building from mere plans and elevations, they know nothing. An elevation, they have heard, shows the building as it really is, from which they infer that a perspective must needs show the building as it really is not. Half of them, perhaps, do not know an elevation from a perspective; and when competitors send in the latter as well as the former, we believe that committees have been known to accept them in perfect good faith, without the least idea that their own rules were being transgressed. Finally, in some cases, comes a rule about having no shading on the drawings; and this, if followed, completes the work which the previous rule began. Unless the building is a mere flat block, with no breaks, no relief, and no recessed or projecting portions, it is quite impossible for any committee to form a true idea of what any design, drawn according to these last two rules, would really look like.

The conditions are issued, the time (usually too short by half) expires, and the designs come in. Now for the first time, the committee realise, probably with amazement, and perhaps with bewilderment, the possibilities before them. Half the competitors have set several of their rules aside; the most scrupulous have been compelled to break one or two, for as we have seen, some of the rules clashed with each other; but their rules are the last things the committee think of at present. Is their town to be hindered from having the best or finest or most convenient building they can choose for it, merely because they framed rules which they would not have framed had they known all they know now? When they specified the building at C., as a model for their building at B., they had no idea so many better types could be found. When they insisted on getting all the accommodation on such a slice of their ground, they never knew what a very much better place could be built by taking a few yards more. When they limited the cost to £20,000, meaning £30,000, it was because they thought that quite enough for an everyday, humdrum piece of building like the model they were looking up to then: but now that there is a chance of doing something firstrate, is not it worth while to stretch a point, and pay £40,000, for what will really be a credit to themselves and the neighbourhood? And when they said there were to be no perspectives, and that the drawings were to be in outline, should not all the architects have known that they would never understand outline elevations, and do not the architects who had the sense to foresee this, deserve to be rewarded rather than punished? In this way, the rules go one after the other. The committee who framed them find that in meaning to tie down the competing architects, they were only twisting cords round their own wrists; and having decided on what they consider the best design, the greatest difficulty they have to contend with is, how to accept it in the teeth of their own "Conditions."

Our remarks have no reference to any of the recent competitions in particular. A multitude of competitions have followed some such course as that here sketched out: some of their rules have been conflicting, others unwise, and others again expressly framed, one might fancy, to give the worst designs as good a chance of being chosen as the best. With such rules before them, competing architects are in a strait. Are they to look on the rules as possessed of a sort of verbal inspiration, and follow them minutely—or are they to try and discover the real wants of the rule-makers, and supply them, although this involves breaking the letter of the rule? The architect who does the latter is likely to be reviled, and the architect who does the former will hardly gain the competition. The truth is, that architects ought not to be placed in such a dilemma. Either the rules should be put forward only as recommendations, which any competitor may disregard if he likes to take the risk of it, or they should be drawn up by an impartial and experienced professional assessor, after full discussion with the committee. Even in this case it is well that they should be as elastic as possible, that neither the committee nor their adviser may find their own rules turn round upon them at the close, and force them either to take an inferior design, or to draw upon their devoted heads the wrath of all the law-abiding competitors.

UNSAFE BUILDINGS.

SINCE our comments were made last week on the recent fall of a house in Oxford-street, other casualties have happened of a similar nature, though, happily, unattended with loss of life; one is the fall of a portion of a building in Peter's-hill, Knightrider-street, in the City, and the other the collapse of some vaults in White Hart-street, Drury-lane. Unfortunately, in the case of new buildings, the insecurity of a structure is not discovered until after it has been erected, for, as we have already hinted, the remedy of the law comes too late. In the case of old rotten buildings, the machinery in the hands of the Metropolitan Board is also insufficient to cope with the mischief; a building must be discovered to be in a dangerous condition by some one before it is examined by the officials of the Board, and pronounced dangerous, while in most cases danger is not found out till someone hears creaking timbers, and sees bulging walls, or finds a house has actually fallen into the roadway. There can be very little doubt that there are scores of buildings in London in a threatening condition, party walls that are merely hanging on by the help of their neighbours, or their front walls in such a tottering state that very little is required to cause them to fall into the streets. In old streets where private houses have been knocked into shops by the insertion of breastsummers, one might count dozens of house-fronts in a very queer and shaky state, and as they merely hold on by means of the floors and roofs, it only needs a jar to shatter them outwards. Fronts with two windows and a centre pier of brickwork between are the most doubtful, as the brickwork often gets shaken by alterations, causing the window arches to drop in the centre, and to cast all the weight on the weakest point of the breastsummer.

The accident, last Friday night, in Peter's-hill, which is a short and narrow thoroughfare leading from Knightrider-street to Queen Victoria-street, is another instance of an old building weakened by previous alterations, and impaired by decay. The premises which have fallen form a part of No. 34, Knightrider-street, a corner block of old buildings, used but recently as a coffee-house. It was very fortunate the house was empty at the time; probably it was its shaky condition which caused the removal of the tenants. As a police-officer was passing up the hill late in the evening he saw the whole of the back part of the premises in Peter's-hill fall out into the street, blocking up the road, and two persons passing down the hill had a very narrow escape. Our examination of the ruin has been sufficient to convince us of the cause of the failure. The premises are clearly very old, and adjoined a vacant spot of ground at the back of a large warehouse, caused by the removal of a house between them. The back walls of the coffee-house and warehouse were thus left without support. Clearly two causes operated to bring about the fall; one was the inherent rottenness of the timbers, and the other the removal of the adjoining house. Possibly also the building had been tampered with by alterations. The side wall which has fallen bodily into the street appears to have had three large window casements on the first floor, the frame of which has fallen *en masse* with their head and sill timbers. The walls look to be completely rotten and are a combination of brick and timber. The fallen structure seems to have been dragged away from the remaining part, simply from the incoherence of the walls. One of the timbers we saw was so pulverised from decay, that the thought occurred to us the walls may have lost their bond or have subsided. The part still standing is in a very critical condition and is probably securely shored up by this time, for the separation, as might be supposed, has taken place between the cross walls in the weakest part.

The causes of insecurity are evident to any practical man, and the question is, Cannot they be avoided by timely measures? It appears to us a great source of danger is the pulling down of adjoining houses, particularly in old neighbourhoods, and the provisions of the Building Act do not meet the risks. Notices of pulling down should not only be required, but an official inspection demanded in every case of the buildings on either side. Till this precaution is taken we shall continue to hear of these casualties. The Dangerous Structures clauses chiefly apply to buildings that are in absolute danger of falling, but not to those which have lost their support, and it seems desirable, whenever amendments are made, to introduce a provision for the latter. Mr. Walker some time ago drew attention to the importance of a proper definition of the words "dangerous state" used in the Act, and if the adjective were a little more explicit, and made to apply to all structures that have lost support and are not in a permanently secure condition, we might see a beneficial change.

The danger arising from the sudden giving-way of vaults is one of which we cannot plead ignorance, and to which the public are hourly exposed in our streets. The great promenades of the Strand, Holborn, Oxford-street, and, indeed, of all our leading thoroughfares, rest upon a succession of vaults, and if one gives way it not unfrequently leads to the falling in of several others on either side. Accidents of a similar kind to that which occurred near Drury-lane have happened before in London, and have been attended with serious results. In White Hart-street it was the roadway which fell in, one built on a succession of vaults, thus adding greatly to the peril of the traffic. Luckily the giving-way of vaults is not common, and perhaps it is surprising we hear of so few accidents from this cause. We should like to know how many roadways are formed upon arches, and how many of these arches have been constructed with good sound bricks in a proper manner. A house-to-house inspection would reveal many vaults in a precarious state barely held up by the support of the adjoining vaults. What with dangerous structures threatening our heads along the streets, and an unseen danger below our feet, the public cannot be blamed if they become a little disquieted and apprehensive. Sometimes, however, this feeling of uneasiness exceeds the bounds of reason. A contemporary a day or two ago, under the heading of "Dangerous Structures," drew attention to a block of four houses and shops at Hammersmith in course of erection on the north side of Bridge-road, which had created some excitement on Sunday last in consequence of a rumour that the new buildings were in an unsafe condition. The police were communicated with, and the passenger traffic on one side stopped, under the idea that the building would collapse. A number of curious spectators collected on the spot, and it is said the district surveyor has condemned the buildings as unsafe. Having made an inspection of the building, we are bound to say the report has been exaggerated, though there was some ground for uneasiness. The four houses are built of red brick and are scarcely roof high; but the work is proceeding, and we were informed that the surveyor has passed the work. The front wall is carried on rolled iron girders of 9in. or 10in. deep, two under each front wall, side by side, and they have wood flitches bolted through on the outside for the fixing of the fronts. These girders rest on the party-walls, which are about 14in. thick. To conform to the line prescribed by the Metropolitan Board, a slight angle occurs in the front, between the third and fourth house, which has perhaps weakened the bond by the closers, and the idea of instability may have easily arisen from the visual distortion of the lines of the front at this point. To an ordinary spectator in the roadway, the front looks naturally lower at this part, as if it had sunk; but as a good pier of brick is under it, and there are no visible signs of settlement above on the outside, the illusion is not borne out. There are, however, more tangible signs of weakness in the raking shores and the upright baulks of timber which have been placed below the girders at this part on either side of the party-wall, and their presence here might well suggest the idea of insecurity. It would appear an arched entrance was intended to have been built here, but that the architect had it removed, so that the arch should not cut into or weaken the pier. Without expressing any opinion as to the actual scantlings and superposed weights, the piers supporting the ends of the girders look weak for their height. The girders are strong enough for their work, as they are double, and the brickwork over them does not rest as a central weight, but is broken by a wide window-opening, so that only the ends of the girders and outer piers carry the weight of the front. There is nothing unusual about the method of construction: thousands of houses are built in this manner, their entire weight resting on the party-walls, which form so many long legs, or piers, below the breastsummers. In regard to constructions of this kind, we confess we should like to see more solidity in the piers and intervening cross-walls, good templates to carry the girders, and the brickwork carried up on a good concrete foundation in cement. The piers are the critical points; if they are wide and solidly built of good bricks there is nothing to fear; but if they are carried up like common work, as they often are, they become a cause of apprehension directly the whole weight of the front wall is put upon them. Before the shop-fronts are fixed, houses of this kind never look very secure, particularly when they are only one room deep, as in the case referred to above. Standing as they do on so many transverse legs, the higher these become, the greater the risk and the care required. A desirable alteration would be that the piers carrying the fronts should be built wider than they often are, so as to form a kind of lateral buttress; but, of course, no precautions in building will compensate for a weak foundation.

ANCIENT LIGHTS.—II.

BESIDES the acquisition of a right to Ancient Lights by an occupancy of at least twenty complete years under the Prescription Act, there is another, and a more roundabout, way of obtaining the same result. If one man, either by his express agreement or tacit acquiescence, allows and induces another to go to expense in opening a new window or enlarging an old one, he will be restrained by a Court of Equity from afterwards blocking up that window on the ground that it is not an ancient light. This is one of the many cases in which the Court of Chancery has used its power to prevent that injustice which would have happened had the law had its way; as in this supposed state of affairs there would have been no legal title to the window, and, but for equity, the man so acting would have been able to go back upon his agreement. Since the Judicature Act, however, the principles of law and equity are equally administered in all courts; though for many reasons of convenience, litigation as to such matters as ancient light is still carried out in the Chancery Division. To support the right in this last way there must always be distinct evidence of consent to, or acquiescence in, the opening of new windows, and there must also be some expense incurred by the dominant owner in so doing, and, generally, some consideration received by the servient owner. In one case, a landlord granted a lease of certain premises, with the ancient lights, in consideration of certain improvements, one of which was the opening of new windows; he afterwards let the adjoining land to another person, who proceeded to block up these windows. But the Court held that the case did not stand only upon the footing of ancient lights, but upon the agreement also; and, therefore, that neither the landlord nor any one claiming under him could build against the new windows that had so been opened. Then there is the more recent case of "Cotcbing v. Bassett" (32 Law J. Rep: N.S. Chy.; 286), where the owner of a dominant tenement, in the course of rebuilding, altered certain ancient lights. He had, however, only done this after communication with the servient owner, and with the knowledge of his surveyor, though without any express agreement. But the Court held that the acquiescence was enough, and granted a perpetual injunction to restrain the servient owner from obstructing the lights as altered.

Presuming, then, that the owner of premises has acquired a right to certain windows either as being ancient lights under the Prescription Act, or in virtue of some agreement or acquiescence such as that last mentioned, what are his remedies against a neighbour who is about to block up those windows or has already succeeded in so doing? Originally there were, and theoretically there still are, three modes of obtaining redress. It is a maxim of English law that a person injured by a private nuisance may himself abate that nuisance. But then he must not injure anyone in so doing, nor can he pull down an obstruction until it is completed, and so altogether this theory is of little practical value nowadays when no wise man will run the many risks of taking the law into his own hands. Then there is the remedy by action at law for damages; but, seeing that the courts of law could not, until lately, grant an injunction to stop, or to pull down, an obstruction, this again was not what was wanted. So plaintiff went to a court of equity, where he was, in time, able to get both damages and an injunction, and so it came about that the Chancery Division is now the proper tribunal in which to seek a remedy for the blocking up of ancient lights. As to the parties who can sue and be sued in such actions, these are one or two points to consider. Anyone in possession of the premises as tenant, though but for a short time, and even from year to year, may sue for the injury done to his comfort and enjoyment of the same; and this although the injury be but of a temporary character. But if the injury be permanent, and such as to affect the property and its inheritance, the reversioner may also bring an action; and he will be able to do so in cases where, though the obstruction is but a small matter, it may affect his title or afford evidence that could be afterwards used against the existence of his right to the lights in question.

The point of the party liable to be sued for an obstruction raises other questions, which can only be answered by considering the facts of each case. Of course an action can be brought against the person who causes the obstruction. So also is the person who continues the obstruction liable if he has had notice of its character before such continuance. Again, if an owner of premises block up his neighbour's ancient lights, and then let the place, he remains liable if the obstruction be continued by his tenant. Difficulties sometimes arise where a person purchases the reversion of premises then let upon lease. If at the time he so buys them there be an existing nuisance in the shape of an obstruction to ancient lights, then, though he cannot abate it, he is nevertheless liable to an action. But if the nuisance arises after the purchase, then, of course, he is not liable, and the only person to be sued is the occupier; yet, even in such a case, if the term be short, and the landlord chooses to renew the tenancy after the obstruction has been erected, he would become liable, as he must not let his land with a nuisance thereupon. Delicate questions as to liability for blocking up ancient lights also crop up where contractors are engaged to do certain works. But the general rule is short and sensible enough. If the obstruction follows as the direct and natural consequence of the orders given to the contractor, then the employer alone will be held liable. If, on the other hand, the nuisance is caused through the default or negligence of the contractor in executing the works, he will be the party solely responsible.

Having decided upon the party to sue and to be sued, and determined to apply for such an injunction as may be necessary, together with damages for the injury already done him, the plaintiff, and his advisers, will have to consider what evidence they can get to support their case. In the Chancery Division, this evidence is generally given by affidavit, though it is usual for both parties to give notice that they wish to cross-examine the witnesses who have made these affidavits, or such of them as they may think desirable. Of course the first point to be proved is the existence of the ancient light for over twenty years; and here the evidence of any aged people who knew the place is very valuable. If the plaintiff bases his case either solely, or in part, upon a written agreement under which he was induced to open the window in question, or upon the acquiescence of the defendant or his predecessor in title, this must be proved likewise. Then we come to the evidence which he can bring forward with a view of showing that his supply of light and air will be so reduced by the defendant's act of obstruction as to make his house less comfortable for occupation, or to render his premises less fit for carrying on his accustomed business. This evidence falls into two divisions. There is, firstly, the testimony of witnesses as to the actual effect that has been, or will be, produced by the defendant's wrongful action; and, secondly, evidence as to the amount of sky area of which the plaintiff will be deprived in the same manner. It is impossible to give any hints as to the former of these classes, for everything depends upon the special facts of each particular case. The latter branch consists of evidence to prove the height and width of new and old buildings, and the deductions drawn from scientific men as to the reduction in the amount of sky area that will be open to the plaintiff after the proposed alterations. It is usual to produce a model proving all these points, and one so constructed as to show the changes that have been, or are to be, made is the best. In one case an experiment was tried as to what would be the effect if the defendant's buildings were completed by raising sackcloth or tarpaulin on poles, and then lowering it again to the old position; but such things should always be done in the presence of both parties, or the results will be of little or no value at the hearing.

It is very common in cases of this kind for the plaintiff to apply for an injunction while the suit is pending, and before it comes on for trial. This interlocutory application is often made immediately after issuing the writ, and, in fact, as soon as the plaintiff finds that the defendant means to proceed with his obstruction, supposing one to have been threatened or commenced. In Equity, it is always the duty of a party seeking relief to come to the court without delay, and, for this reason, an interlocutory application may often be advisable. But in granting such an injunction the court will first consider the balance of convenience; and unless a strong case is made out, it usually orders the matter to stand over until the cause comes on for hearing; making the defendant agree to use all diligence in his pleadings, and undertake to remove the obstruction if ordered, or not to go on any further with his buildings, according to the circumstances of the case. At the hearing, presuming the plaintiff to succeed, it becomes a question whether an injunction shall be granted, or damages awarded, or both. It must be borne in mind that there are two kinds of injunctions; one restraining a thing from being done, the other commanding a thing to be undone. This latter is termed a mandatory injunction, and it is, obviously, a much stronger proceeding than the former, which merely stops the erection of buildings that are but just begun. It may be taken as a general rule that no mandatory injunction will be granted upon an interlocutory application. Nor will the court, even at the hearing, grant such an injunction, the effect of which would be to make the defendant pull down the obstruction, whether it be a wall or a house; unless it is so serious and extreme a case that full justice cannot be done by damages alone. But where the building is in progress, then the usual remedy is by way of injunction to restrain the defendant from going on with it so as to block up the plaintiff's ancient lights. Sometimes when the case has been heard, and the plaintiff has been successful, a course is agreed upon by the parties as to altering the new building and paying damages and the like; but, of course, all these matters vary with the facts of each particular case, and, therefore, the possible combinations are almost endless. If damages be awarded by the Court, the amount thereof will be decided according to the evidence which each party may bring forward. But there are cases in which the plaintiff does not succeed, as where the right to windows which he claims has been lost after its acquisition: and this point, with other forms of defence, and some recent cases in which injunctions have been granted, we shall consider in our next article.

A RECENT VISIT TO RUSSIA.

(*Continued from p.* 265.)

In concluding our review of the buildings crowding the interior of the Kremlin at Moscow, we must note

THE ARSENAL,

standing with an east frontage, and occupying the left-hand side of the northern apex of the inclosure. The ground it occupies was formerly a meeting and residential place of the Russian nobles. This building, the erection of which ranges from 1701 to 1736, is upon the model of the arsenal of Venice. It is a long plain building of two stories, with a portico and pediment in the centre. The ground-floor in the interior is vaulted, and arranged on the principle of our Tower of London, the contents being old flags and accoutrements of war. One portion of this building was blown up by the French in 1812, but the damage has been made good. The detail this building is most celebrated for is the base, which is built up about four feet high, and brought out before the face of the main walls about three yards. On this base, which runs the full length of this great building, broken only by the entrance steps, are symmetrically placed the whole of the bronze cannon left in the snow by the grand army of Napoleon in their fatal retreat of 1812. As a military trophy there is nothing to equal it in the world: it bespeaks, not a war of nations, but one of great and mighty races, and its contemplation gives the traveller a better idea of the great struggle of the Russians with Napoleon than does that of any other monument. These cannons and mortars are all of bronze, and the value of the same even as old metal must be enormous. The total number of pieces is 875, consisting of 365 pieces French, 189 Austrian, 123 Prussian, 70 Italian, 40 Neapolitan, 34 Bavarian, and lesser numbers of Dutch, Saxon, Spanish, Polish, &c., &c., the recapitulation of which shows the hold Napoleon had obtained over the armies of Europe, which upon this occasion were pressed into his service. The only ornaments associated with these cannons are sundry Russian eagles in bronze, placed in an attitude of triumph over these their fallen enemies. This string of cannon, half buried as it was in snow at the time of the writer's visit, and guarded by tall grey-coated Cossacks, pacing to and fro with their formidable arms, is a sight that no traveller can readily forget, and one that associates the arsenal of the Kremlin with the most terrible event in history.

Having reviewed the principal buildings in the Kremlin, we will pay a short visit to the

CHINESE CITY,

which is the trading, or old port, of Moscow—a suburb as it were attached to the eastern side of the Kremlin, and protected by a great wall pierced by six gates. These walls, alike of brick, were erected about 1535 by Petroe, an Italian architect, and although not so imposing as the Kremlin walls, they are equally as picturesque.

The ancient entrances through these walls were small, and remind one of those of the city of York; these where retained, are used by foot passengers, and large-arched openings for modern traffic are pierced through the adjoining brickwork. The one nearest to the junction with the Kremlin walls,

THE VOSKRESENSKI GATE,

being the principal entrance into this *Civatas*, has two such archways, and against the broad pier dividing them is placed a votive chapel, dedicated to the Iberian Mother of God, so called from the shrine being brought from Iberia. In this is a miraculous picture of the Virgin, the value of which, as a shrine, is greater than probably that of any other work of art in the world. This little chapel, with its worshippers trooping in and out, is literally a human hive, where in the form of money is deposited no small portion of honey, for the gifts or collections of the faithful at this shrine amount to a fixed income of £10,000 per year, £7,000 of which constitutes the pay of the Metropolitan of Moscow. It is a curious feature in the Russian Church, one well exemplified in the case of the Metropolitan Church in the Kremlin, and this little chapel, planted in the busiest part of this great and wealthy city, that the one is still and silent, and in itself capable of furnishing much in the way of income, and the other, a satellite, which represents an altar or shrine moved to a place where the people most do congregate, is ever busy, and furnishes the bone and sinew of the Church. This system is adopted on all hands, it is reflected in the chapels on either side of the Holy Gate of the Kremlin, in the chapel on the Neva-bridge at St. Petersburg, and in connection with most of the orthodox churches which have chapels of this character, planted in the corners of what we should call the churchyards, where they abut upon the principal thoroughfares. Pondering for a moment over the influence of these votive chapels, placed at every point of vantage in the great cities of Russia, we are led to compare the importance of the national altars of Russia with those of our own country, and to remark that ours have lost, through the influence of the Protestant Reformation, or through the action of the Puritans, a great deal of their reverential awe, and their hold upon the mass of the people. That a system identical with the Russian one formerly obtained in England we have ample proof; it was reflected in such shrines as that of St. Thomas à Beckett at Canterbury, and in the bridge, the wayside, and the holy-well chapels common throughout the land. It is not our office to trace the cause of their decline in England; but their suppression was undoubtedly a great loss to the revenues of the Established Church. The effect of such a repressive measure in Russia would be to cut the mass of the people loose from the orthodox faith, and to sacrifice the principal source of ecclesiastical revenue. Amongst the quaint-looking shops in the vicinity of this gate, the doors of which are open in the most inclement weather, the shopkeepers trusting more to their fur clothing than to fires, was one devoted to the sale of drysaltery. Here might be seen circular blocks of white and yellow wax, piled one on another, after the manner of our grindstones, a detail that reminded one of the proportions of this wax trade, consequent upon the retention of this primitive form of illumination in the orthodox churches, and their associated chapels. Adjoining was one of the many marts devoted to the sale of lamps and shrines. These are rude in art, and manufactured to meet the requirements of the mass of the people, for in every house, in every room, and in every bank, counting-house or office throughout the country, one or more of these shrines are fixed, their position in these cases being near the ceiling, and in the angle of the walls. The subjects of these shrines are saints of the Bible, and the Russian Church, that of the Virgin and Child being the most popular. Like everything Russian, they are gaudy with gold. The ground of these pictures are mostly embossed on gilded paper, with the figures painted on in oil or distemper. The frames are broad plain mouldings, with the angles or mitres rounded in composition before gilding. These frames have the appearance of being laquered on silver after the manner of German mouldings; but their finished appearance is that of common gold. The lamps are of coloured glass fixed in brass frames, and each provided with three brass chains, to admit of their being suspended from the ceiling. Of the mass of these shrines, but few possess any merit in the way of art; the style followed is conventional, of the order known to us as pre-Raphaelite, the principle of working on old models being rigidly observed. Here in the neighbourhood of this gate we may see itinerants of every class; the most curious are those vending the national drink. These men carry kettles of hot tea, on their shoulders are strings of perforated cakes or white bread, and around their waists are fitted wooden frames, constructed to hold about a dozen glasses. At the east side of this gate, and occupying the site of the old wall that formerly connected this gate with the Kremlin, is one of the largest modern buildings in Moscow. This is of brick, and designed in the old Russian style; its purpose is that of a

NATIONAL MUSEUM,

but although it is covered in, it is standing in an unfinished state for want of funds. In dealing with the architecture of St. Petersburg, we noted this revival of the old Russian style of art as being a parallel one to that of our Queen Anne movement. We saw it in St. Petersburg associated with other introduced styles; but in Moscow it is carried to greater excess, and it appears to admit of no rival in this city. As a style, it was that adopted in old times in the domestic buildings of the nobles; it has the appearance of being grounded on Classic lines, and to have been first applied in Russia when the material of construction was wood. The leading features of the windows, which are very small, are blocks at the ends of the sills, on these are placed columns, swelled out in the centre, counterparts of those of our so-called Saxon Era; these support heavy pediments, and, as the window heads are not always square, some partaking of the Gothic or Saracenic feeling, they are strange and incongruous in appearance. The ground is brickwork, carefully pointed at completion. The strings are plastered, and enriched with coloured ornaments, mostly of red and green arabesque, which at first sight gives one the impression of being wrought in English tiles, as it does the belief that there is room for their introduction. The cornices are heavy and void of character; the wall facing is broken up in a manner that can only suggest that the originals, from which the designs were drawn, were executed in wood. The roofs, in some cases, are low, in others they are of the Mansard type, the smaller features being graced with high-pitch coverings in the form of spires. In connection with this style, it is interesting to observe that domes, or other features pertaining to the Ecclesiastical architecture of the country, are wanting.

The interior of this civic portion of the heart of Moscow, with the exception of the Great or Red-square surrounding the Holy Gate of the Kremlin, is composed of narrow streets and blocks of trading marts. These streets are lined with shops, the character of which, although on a smaller scale, resembles those of our English towns more than other Continental cities. Here we see a church, gaudy with the most barbaric colouring of scarlet, yellow, or green, there an hotel, or an exchange, the elevations of which are ordinary, or commonplace. The crowded state of the streets, and the mass of produce from all parts of the old world, remind us that we are in the heart of a great trading city, and that we are in the neighbourhood of the far-famed

BAZAARS OF MOSCOW.

The rights of fixing marts or places of trade appear to have been vested in the hands of kings and rulers throughout all historic times. This was the case in England, where the monks, and lords of manors, sued before our kings for charters or grants of fairs and markets. The policy regulating these staples was that of the trading community coming to the seat of local or other government to vend or exchange their goods. It was a concentration for the more ready mode of supervision and taxation in the form of market tolls, &c., and thus became the source of revenue in primitive times.

Of this great market or mart of Moscow, we learn that it existed in its infant state within the walls of the Kremlin, and that, growing too large for its accommodation, it was removed to its present site, which may be looked upon as an enlargement of the Kremlin, not for state, military, or ecclesiastical considerations, but for simple purposes of trade. As if in proof of this we find the heart of this inclosure composed of bazaars, which, had it not been for the necessity of the Great or Red-square, devoted to regal and ecclesiastical displays when politic for the same to be made in the face of the people, would have extended to the walls of the citadel, or, in other words, from occupying the Kremlin would have moved outwardly to the shadow of its walls.

In passing through St. Petersburg we failed to notice the bazaars or markets, as those of Moscow were of a more national type, and hence it follows that these interesting features are so far undescribed.

The ground plan of the city at this point is a series of black squares, separated by narrow white lines, the latter forming an interminable labyrinth. These, on the one hand, are the shops or stores, and on the other the alleys dividing or separating them. Entering one of these passages, you are struck with their Oriental character. The shops, on either side, are about 12ft. square, mostly unglazed, with a counter separating the buyers or passers by from the noisy fur-clad sellers or venders. These alleys are devoted to certain trades, that of the gold and silver dealers, who expose their goods in glass cases, being the most interesting. The rear of these shops look into private squares or stores for packages, &c., some of which, like our Smithfield market, have another and a wholesale class of dealers beneath. The shops, as we have noted, are almost exclusively attended to by the Jew-looking male sex. At the close of the business, the open fronts of these shops are closed with light folding shutters of sheet-iron, and they are secured with padlocks. In every case a string is threaded through two staples; this is tied at the ends, and sealed with soft wax, worked by the finger and thumb; the seal being the private mark of the owner, usually carried on his finger-ring. Returning in the morning, the first office is to examine the seal, as the shop could not possibly be entered without its removal. This custom of sealing their places of business is one of undoubted antiquity, and one actively pursued in all the Russian centres of trade.

The passages of these bazaars are all covered, the system followed being very quaint. Across these alleys, about 12ft. above the pavement, beams, cased with sheet-iron, are placed, the object of which, we were told, was to preserve them from decay; but which we thought was to guard them against fire. Across these beams, and about 2ft. in width, are continuous gutters, and from the edges of the same, and sloping back to the walls of the store-rooms above the shops, are glazed lights, the whole of which form great troughs over the lines of these alleys. At the intersections, these gutters are stopped, and a kind of dome is formed, the water of the gutters being conveyed by pipes to a hopper, placed in the centre of the same, from whence it is discharged by dropping on to the pavement beneath. The floors of these alleys or passages are paved with stone, and they are furnished with well defined gutters in the centre, which are covered over with boards hung in suitable irons. Our impression was that these bazaars were older constructions than 1812, but we were assured that such was not the case; we must hence infer that they were rebuilt after the burning of the city on an old or primitive plan.

CHURCH-HUNTING IN SUSSEX.

THE ecclesiologist of to-day, the *Saturday Review* remarks, is a very different being from the ecclesiologist of thirty or even twenty years ago. His sympathies come down to a period very much more recent than the thirteenth century. He openly professes a regard for Inigo Jones, and can admire Wren on occasion. A good piece of Stuart panelling fixes his attention more surely than decorated sedilia. The Lombardic character has no charms for him in comparison with a punning but pious epitaph of Cromwell's time. He copies the early entries in the parish register, though it goes no farther back than the beginning of the seventeenth century, and asks anxiously after Georgian forms of special prayer. He looks with wonderful tolerance on pewing, and insists on stripping off the altar-cloth in hopes of finding an Elizabethan oak table. He has a strange habit, too, of carrying a guide-book with him always, but not for the purpose of consulting it. Guide-books do not contain the kind of information he seeks, but he uses them to find out what has not been noticed. When the guide says such a place is not worth a visit, thither he wends his way; and true happiness is his when he discovers a region unknown to Murray and Stanford. Churches unmentioned in the books are to him what editions unnoticed by Lowndes are to the bibliomaniac, or a new old fossil to the geologist.

His ideal of the happy hunting-grounds may perhaps be found in the delta of the Arun. He has an eye like a huntsman's for "a country," and observes at once that behind the coast-line which stretches from Bognor to Worthing, or about ten miles on either side of the mouth of the Arun at Littlehampton, there is a depression which, not long ago, as an old map tells him, was a swamp. Between this and the sea are a number of very small, very old, and very pretty churches. The parishes are microscopic in their minuteness, as they are in Essex near the coast-line, pointing probably to an early and dense settlement of the immigrant Saxons, and by consequence the churches are numerous. Within a few miles he finds church after church—discovers them, as he puts it—on which no archæological papers have been read, and of which no handbook notices more than the name. He sets steadily to work, looking forward, as his note-book gradually fills, to happy hours with Dallaway in the Museum on his return to town.

He passes Clymping with a sigh, Clymping of which he has heard so much. Its almost Doric simplicity, the plain lancets, the solid effect of great spaces of blank wall, the unusual slope of the roof, all are points of momentary interest only. Clymping has been "done." Clymping has attained celebrity. It has been "thoroughly restored"; but even this does not interest him. The curious niche in the tower with its zig-zag mouldings seems to him to have no look of age left, and he refuses to accept as ancient what, he asserts, is but a modern architect's interpretation of ancientness. But at Ford he warms up. Though the place is in the books the church is hardly mentioned. It stands in a low meadow surrounded by wooden fences. There is no road to it, only a grassy pathway. Small as it is—so small that a neighbouring house seems to tower above it—every style of English architecture seems to have left a mark on it. There are Norman features in the little round-headed windows of the chancel. There are First Pointed lancets, and "cottage-headed" windows besides, and, most interesting of all, there is a porch, which contrasts in its ruddy mellowness of lichen-coated brick with the grey flint walls of the older building, as well as in its curved gable, speaking of the "restoration," which, we are told, took place in the days of Archbishop Laud. Not half a mile further is Tortington, almost surrounded with the woods which here put forth an arm from the neighbouring park at Arundel. The priory of St. Mary Magdalen has disappeared, and the vicar, who used to have "corrody" for himself and his servant with the canons, now lives in the neighbouring town. The church is full of objects of interest, though scarcely larger than Ford, the chief feature being the chancel arch, so often described and figured as an example of the grotesque ornament of the Later Norman style. The church-hunter does not long delay at Arundel. Is it not fully described in numberless books? The new Romanist church, not long finished by the Duke, impresses him favourably from a distance, but unfavourably on a nearer view. The situation is magnificent; but the architect, wishing perhaps to make the most of it, has made too much. Obtrusive, vulgar, are the adjectives which rise to our ecclesiologist's somewhat prejudiced lips, and when he visits the interior the chromolithographs on the walls and the decorations of the altar make him add the word "tawdry." Of the parish-church he has heard too much lately, and hurrying down the hill and across the bridge, he seeks once more the thickly-strewn churches of the coast.

Leominster, in spite of its high-sounding name, does not keep him long, for it is both thoroughly restored and well described. At Rustington he pauses. The lych-gate at a corner of the churchyard, the two wooden porches with their massive oak beams, the Transitional Norman windows of the tower, the frequent lancets, give the place a great charm in his eyes; nor does the interior disappoint him, with its numerous tablets and the fragments of one very ancient monument, perhaps of one of the Bohuns, whose co-heiresses divided East Preston and Rustington, or West Preston, between them some time in the twelfth century; but he seeks in vain for any memorial of Thomas Baker, who was "of Rustington," and whose grandson, the great John Selden, probably often sojourned at the manor house on the other side of the road, now a rather shabby-looking farmhouse. At East Preston he is told by a villager that the church is the oldest in the country, a statement which he receives at first with incredulity, but an inspection of the chancel, which was invisible from the road, justifies it. The little round-headed windows date from the very beginning of English architecture. Angmering looks too fresh to attract him, though there are features of interest in it which even a virtual rebuilding thirty years ago has not obliterated. Patching had once a shingle spire and a north aisle; but a tablet over the door records the gratitude of the parishioners to a certain Sir Richard Hunter who "repaired and beautified" the church in 1835. To him, probably, we may attribute the whitewashed ceiling, half hiding the roof-beams, and the thick coat of yellow paint which covers the pulpit. This pulpit is a joy to the modern ecclesiologist. It is of the ordinary wine-glass pattern, but worked into it are five panels, in which thick coats of paint cannot disguise the exquisite carving or the Holbeinesque design. What is the Perpendicular choir-screen, what the curious double miserere seats, to this series of panels? But the day is waning, and hours would not suffice to copy patterns as intricate as an ornamental engraving of Beham, and the town parson rushes off to Clapham. There is a steep hill down and a steeper hill up through a village-street of cottages too well-built for picturesqueness, add he turns in at a gate and across two fields to a wood through which the pathway climbs the hill. On his right is a picturesque farmhouse of considerable antiquity, and immediately before him, half-hidden among the oaks, is the church. It somewhat resembles Clymping; but its Early English features are many of them the result rather of a recent "thorough restoration" than the genuine article. He cannot but admire the western lancets from under the new lych-gate, and can well believe it when he is told that at the opening service after the restoration the music within was answered by the nightingales without. In the churchyard on the left is a monument to the mother of that genial novelist, Frank Smedley, but memorials of greater literary interest are within. In the centre of the nave, just below the chancel step, is a brass in exquisite preservation. It was long hidden away under the pavement, to which fact its preservation intact may perhaps be attributed, for the curious and delicately-designed representation of the Trinity between the figures could not long have survived a Puritan visitation, however mild. In 1526 the knight Sir John Shelley died, having married Elizabeth, the heiress of the Michelgroves, to whose inheritance he owed his transplantation into Sussex out of Kent. The Michelgroves had themselves come from Kent, where they had figured as Fauconers of Fauconhurst, and though they changed the name, the hawk remains on the coat-of-arms which the lady wears in brass. From her second son descended the poet, who was born at Field Place, a few miles off across the hills. The Shelleys continued at Michelgrove till the beginning of this century, and the chancel is full of their tombstones. There is the judge, with his wife and his children, *in alto relievo*, under a canopy, and there is the epitaph of his wife's sister, "Bona et virtuosa Gresildis," wife of John Caryll. The Carylls were seated at West Grinstead, and it was to one of them that Pope dedicated the "Rape of the Lock"—"this verse to Caryl, Muse, is due."

NOTRE DAME DE FOURVIÈRE, LYON.

WHERE the Saône emerges from the maze of hills which beset the last part of its course, and enters the broad open valley of the Rhône, the confluence of these two noble streams is overlooked by the heights of La Fourvière, which rise prominently among the lesser hills near by.

This elevated position was selected by the Romans for their fortified town of Lugdunum, and later on (in the 9th century) the early Christians built, with the ruins of the ancient forum, the church of Notre Dame de Bon Conseil, and the "foro vetere" originated the name of Fourvière. When the town, deserting the summit of the hill, occupied the lower slopes upon which the thirteenth-century cathedral stands, Fourvière became a renowned pilgrimage, and such it is still, when the city of Lyon has covered the strip of land between the parallel rivers, and spread a magnificent town far away into the plain beyond the Rhône.

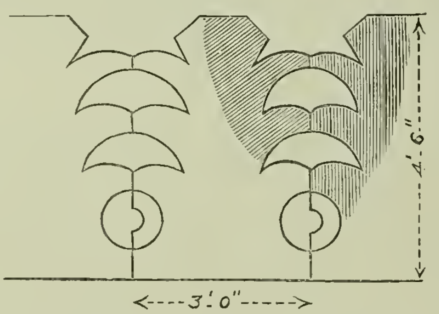
The number of devotees coming to this celebrated shrine having so largely increased beyond the accommodation available, it was lately determined to erect a church of grand proportions to replace the existing building, and this edifice is now, so far as concerns the exterior, approaching completion. The external scaffolding is all removed, except to the west front, and the church towers above the city, visible from every part of it, in nearly its final form.

It is, on plan, a great parallelogram with an octagonal tower at each angle and a circular apse at east end, which, from the steep slope of the hill, has the crypt, and also another story below it, visible above the ground line.

The whole is designed upon a very large scale, probably out of regard to the nature of the site; but it is doubtful whether this characteristic is not somewhat exaggerated, as, in the fewness of parts, the actual size is not realised, and the hill itself appears diminished by the large-featured edifice.

The style is altogether modern. It has some resemblance to the Romanesque and transition periods in certain effects, but this is only partial. The northern and southern façades, each about 200ft. long, are divided into three bays by two massive projections, piers rather than buttresses, which, breaking through the heavy corbelled cornice and crenellated parapet of the wall, to finish a few feet higher in the same manner, give a fortress-like appearance to the structure. The four towers at angles rise one story of open arcade, now in course of construction, above the cornice, and are to have low roofs (which will not be seen above the parapet), and finials and flagstaff. The low pitched roof of the church itself will also be entirely concealed. In each bay there is a gigantic three-light window with pointed arch, and, in tympanum, a rectilinear star-shaped opening. The total height of these windows is about 40ft. The windows to crypt form a continuous colonnade above the ground line and below the plinth, with strangely novel forms of decoration. The apse is about three-quarters of a circle on plan, with seven obtusely pointed arches around, upon lofty shafts, with lancet openings between. One of the effects of these arches, circular on plan, is to apparently augment the projection of the upper works of carved angles, corbels, and cornices. The pierced parapet of the external walls, which, at a distance, has the effect of battlements, and which, in fact, would be very serviceable as such, is in great stones of foliated form weighing some twelve hundredweight each. The sketch of these (Fig. 1) will give some idea of the large scale of detail adopted.

FIG. 1.

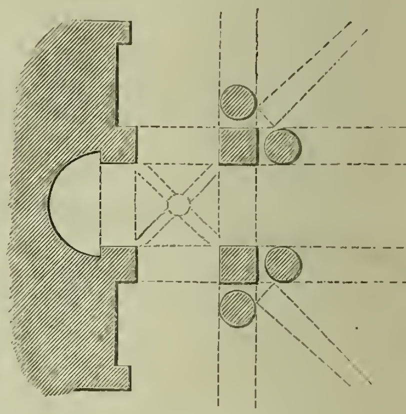


Below the principal story of the apse, of which the arcade before mentioned is about 50ft. high, an open arcaded gallery contains a double staircase, conducting to a portal below the crypt level, the roof of the gallery forming a terrace which commands a magnificent view of the city below. (This lately-completed terrace was this year [September 8th] the scene of the ancient annual ceremony of the dedication of the town of Lyon to the Holy Virgin.)

The west front, which is away from the town, is not so far advanced. It is to have a great portal of three arches, the whole breadth of the front between the towers, upon columns (already fixed) of polished grey granite with elaborately ornamented pedestals of the same material. Over this is to be a smaller continuous arcade with a gable of the low pitch of the roof. The lower part of all façades, up to the plinth, which is at about the principal floor level, is executed in a hard grey limestone; the remainder of walls is in white sandstone, somewhat softer.

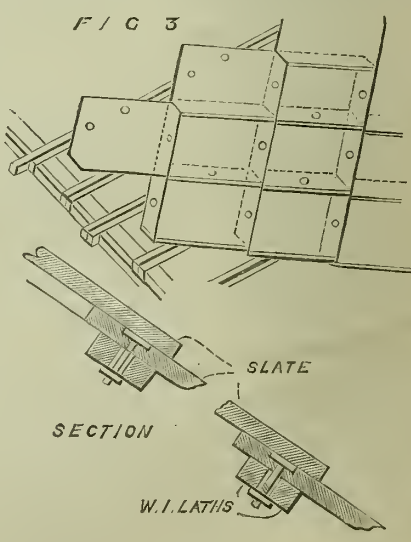
Internally, the crypt is clear of scaffolding, and complete, except for the carving, of which a great abundance is intended. The general effect of this part is fine, yet strange. The church is divided longitudinally into nave and pseudo-aisles; and transversely, into three bays separated by short sections of waggon vault upon pairs of columns. Under these the piers and columns in the crypt are grouped in a manner which Figure 2 will best explain. The columns are of Doric proportions, diminished and fluted, with capitals and entablature of Romanesque character of detail, in the one which is carved and completed. On the cornice over each column are little paired colonnettes carrying segmental vaulting ribs. This combination has, in the multiplication of parts for purely decorative purposes, an effect which reminds one of the Hindoo temples of Buddha. The diagonal ribs, springing from corbels, diminish toward the bosses, which are composite and elaborate, of large radiating design. Windows of an ordinary form, opening above the ground level, give light to this great chamber, which is, to the crown of vault, about 30ft. high.

FIG. 2



The church above is, at present, filled with the scaffolding, a workmanlike yet economical structure of timber, with three complete stages or floors, formed with an open passage way down the centre of the full height, for the working of the travelling crane, and furnished with various tramways for the conveyance of the ponderous stones used. The roof is now being covered in, and it is of so novel a construction that a detailed description may be useful.

FIG 3



It is of wrought iron, in one span from wall to wall, independent of the internal columns. The trussed lattice purlins and principals carry lighter rafters, also of iron, and upon these are fixed the wrought-iron laths for the slates. The covering is of sawn slate slabs, one centimetre thick, and one metre square, laid diagonally with a lap of 12 centimetres; and each secured with two small copper bolts, passing through drilled holes, the heads of which, in a sinking, are covered by the next slab. The laths of wrought iron are double bars, 1·5 centimetre square, with a space between, through which the bolt passes and is secured with the nut below (see Fig. 3). No cement is used to the joints, but the slabs being truly sawn, lie very close. The drawings of the interior show diminished columns of decorated forms, upon elaborately designed pedestals, carrying pointed arches, with three domical ribbed vaults over nave, with short sections of waggon vault between, as in crypt. The aisles are to be vaulted with transverse waggon vaults, with open arcade work under springing to lessen the height of the arch. The columns and pedestals are upon the works, and about to be fixed; the former are of grey, the latter of white Italian marble, polished, and are in unusually large blocks, and of splendid quality.

There is no indication externally of this longitudinal division of the church into nave and aisles. The west front, the apse, and the roof suggest one vast chamber within.

There is a general prevalence of those free curvilinear forms and outlines in main features which distinguish much of modern French architecture, and which, upon such a scale, and in such a work as this, lack the repose and dignity of the right-lined shafts and compact detail of the ancient Christian architecture. The ornament is sometimes open to criticism, also for its unconstructional motive, and for the want of sympathy between various portions.

The general dimensions are about, length (including apse) 255ft., breadth 120ft. (to outside of towers), heights, crypt 30ft., church, to tie of roof, 80ft., a total of about 125ft. from floor of crypt to ridge. The tower, like east end overlooking the town, has a height of about 150ft. The old church, with its tower scarcely exceeding the height of the new walls, is to remain, connected by a passage with the new building.

This great work has already cost some 3,000,000fr., and will require at least another million to complete it.

The works were commenced in 1872, and are being executed from the designs and under the direction of M. Bossont, architect, of Lyon.

R. W. Gibson.

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EXHIBITION OF SCOTTISH PAINTINGS IN EDINBURGH.

THE Royal Scottish Academy proposes to open, in the beginning of the present month, a representative collection of the works of Scottish painters. The object kept in view was to procure a representation, not merely of what might be considered best in Scottish art, but of all phases of Scottish art of which presentable examples were obtainable. Most of the portraitists whose work formed the chief development of early Scottish painting will be found well represented, and will show that the national art in the one department for which at that time there was any demand, attained in the hands of Jamesone, Aikman, and their successors a quality not unworthy to be compared with the average of contemporary English work. Jamesone's portraits are generally in so frail a condition as renders it dangerous to move them; but the exhibition will offer, at least, one good example of the Scottish Vandyck, in his own likness. Of Allan Ramsay's art there will be found an attractive selection, including a portrait of Lady Inglis of Cramond, lent by Sir John Don Wauchope. A number of works by Ramsay's pupil, Martin, may show that the latter was a more capable artist than is generally imagined. George Watson, the first President of the Scottish Academy, will be represented by several heads, specially interesting being that of his mother, who was also the grandmother of another President of the Academy, Sir John Watson Gordon. Sir David Wilkie's full-length of George IV. has been obtained from Holyrood, and his portrait of the Earl of Kellie from Cupar; while his art will be further illustrated by a small picture of "The Gentle Shepherd." David Scott's "Queen Elizabeth at the Globe Theatre," "Machiavelli and the Beggar," the "Vision of Life," and other notable examples will be hung. Thomas Duncan will be represented by several works, including his "Queen Mary signing her Abdication," Robert Lauder by the "Effie Deans," as well as by "Glee Maiden." The exhibition will embrace John Phillip's powerful "La Gloria," and other specimens of that able painter's style, and several fine portraits by Raeburn, not hitherto exhibited, besides the admirable head of Bailie Galloway, from the Merchant Company's collection. The collection will also comprise a number of heads by Geddes, while the more recent portrait-painters — Sir John Watson Gordon, Mr. Graham Gilbert, and Mr. Colvin Smith — will be represented. Among the landscapists, Alexander Nasmyth will appear to advantage, and so will other members of the Nasmyth family. As much may be said of the Rev. Mr. Thomson, of Duddingston; and Horatio Macculloch is to be represented by "Loch Aneilan," and "Kilchurn." The art of the late Sam. Bough will be favourably displayed in three of his best oil pictures, together with a number of water-colours. The specimens secured of G. P. Chalmer's work will not discredit his reputation. The hanging of the exhibition is now in progress, and it is intended that the galleries shall be opened to the public on Wednesday next. Mr. Fettes Douglas, F.S.A., is engaged in preparing a catalogue, which will embrace brief biographical notices of the principal painters represented.

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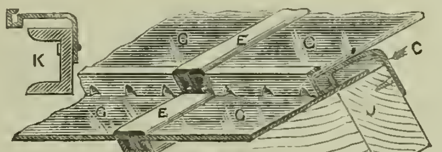
RENDLE'S "ACME" SYSTEM OF GLASS ROOFING.

MR. W. E. RENDLE, well known as the introducer of the improved system of glazing without putty, has recently patented an improvement in connection therewith which secures several very important advantages. The nature of the improvement will be readily understood from the sketch appended. C is the new patent "acme" horizontal bar; E the new patent "acme" vertical bar; G is the glass; J the wood purlin, showing the method of fixing bar; and K a channel iron purlin dispensing with wood. The advantages are: 1st, The lap is greater, on account of the clip securing the glass being narrower; 2nd, There being no clips the rain runs away freely; 3rd, The channels of the vertical bars are square, thus filling the slot in the horizontal bar, and giving greater strength to the glass; 4th, The purlins are narrower; 5th, The "acme" bars can be used without wood (see Fig. K), a great consideration, especially in tropical climates, where wood-destroying insects abound. The new system has already been used at St. Bartholomew's Hospital, Messrs. Howell and James', in St. Paul's Churchyard, and elsewhere, with satisfactory results.



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MORTUARIES FOR TOWNS AND VILLAGES.*

(Continued from p. 368.)

SEEING the unsatisfactory state of the law, Dr. Joseph Rogers, whose services in connection with sanitary work are well known, and who, some twenty-four years before, had the principal share in the establishment of the mortuary at St. Anne's, Soho, which was for several years the only one in the metropolis, moved, in the year 1875, at the Strand Board of Works, that, "With the view of the more effectually and economically securing the establishment of mortuaries in the different parishes of the metropolis, this Board do memorialise the Metropolitan Board of Works, urging that Board to apply for powers in the next Session of Parliament, authorising that body to undertake their erection in such parts of the metropolis as may be considered necessary." The Metropolitan Board declined, however, to take up the subject, on the grounds that the mortuary question is beset with difficulties in London, and is one which should be dealt with by the Local Boards, and not by the Metropolitan Board. The Strand Board of Works interviewed the then president of the Local Government Board, for the purpose of securing the aid of his department in establishing mortuaries in different parts of the metropolis. A deputation from that body waited upon Mr. Sclater-Booth in January, 1876, when Dr. Rogers made a telling speech in favour of the extension of mortuaries, winding up by formulating the points that should be attended to with reference to the question. These were: "1. That it should be made compulsory on every local board to establish a suitable mortuary on a common plan, to be approved of by the Local Government Board or the Metropolitan Board of Works. 2. That these mortuaries should be in the proportion of not less than one to every 50,000 inhabitants. 3. That powers should be provided for the compulsory purchase of property under the provisions of the Lands Clauses Act, and for enabling parishes or portions of parishes favourably situated for such purposes to combine to form mortuary districts; such mortuaries to be maintained at their joint expense, and for their common use. 4. That the medical officer of health, or the Poor Law medical officers, or the relieving officer, should be empowered and directed to order the removal of a corpse to the district mortuary in all cases where it was found that the family, at the time of such death, occupied only one room, and in such other instances where it appeared desirable to these officials to direct the same.'

Not much of promise was extracted from Mr. Sclater-Booth; but he undertook to confer on the subject with Mr. Cross, who as Home Secretary had more control over the vestries than the Local Government Board had. In the ill-fated Public Health (Metropolis) Bill of 1877, which Mr. Sclater-Booth introduced with the view of making the public health law uniform for the metropolis and country, clauses were inserted re-enacting the clauses in the Sanitary Act, 1866, bearing on the question, but making the provision of a mortuary compulsory, if the Local Government Board so directed. The fate of this Bill is, however, well known; and we are now in the Metropolis almost as badly off as ever, certainly as badly off for any reasonable system of the disposal of the dead, pending interment. Might it not be expedient and useful for the Institute to take up the question where it was left in 1876, and endeavour to induce the new Government to make a move with regard to this important branch of public health machinery?

Proceeding to offer suggestions for the establishment and management of mortuaries, the author went on to say: The word mortuary does not appear in the index to any book on hygiene with which I am familiar. I have therefore had to rely very much upon the facts which I have been able to pick up in the course of my reading, and upon my practical experience of the requirements of such erections.

Mortuaries have been provided in this country in a great variety of ways. There are, first of all, the separate erections, with post-mortem room and coroner's court, such as the mortuaries in the City of London, at Islington, Clerkenwell, and in some of our large towns. There are the mortuaries provided by sanitary authorities in connection with infectious hospitals that they have established. There are the mortuaries provided at cemeteries, or on licensed burial-grounds. And there are the mortuaries, if such they can always be called, provided at general hospitals for the bodies of persons dying in the institution, but rarely thrown open to the outside public. Of the latter I do not intend to speak. These are not public mortuaries in any real sense of the word. They are simply furnished for the convenience and use of the hospital authorities, and for post-mortem purposes, and are intended, in addition, for the purpose of keeping the corpses out of the ward until the time comes for burial. Indeed, it may safely be said that no mortuaries, in any comprehensive sense of the word, exist at hospitals.

Of mortuaries proper, all sorts and sizes exist, from the elaborate erection provided at a cost of £12,000, by the City Commissioners of Sewers, in Golden-lane, comprising a mortuary chapel, with twelve slate tables, keeper's house and offices, coroner's court, laboratory, weighing room, consulting-room, dead-house fitted for post-mortem examinations, disinfecting apparatus, ambulance shed, shed for disinfecting apparatus, down to the old parish dead-house, or pest-house, which has, in some places, been utilised for the purpose, and is almost, if not quite, destitute of all furniture. One of these pest-houses is to be found at Greenwich, where it stands in the churchyard, to the disgrace of the local health authority.

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* The Necessity and Importance of Mortuaries for Towns and Villages, with some Suggestions for their Establishment and Management. A paper read by Henry C. Burdett, Member of Council, at the Sanitary Congress, Exeter, on Wednesday, Sept. 22.

I proceed then at once to sketch out certain features of a mortuary, as regards its establishment, situation, and regulation.

And first, as to its establishment, I have already mentioned in a former section that, under the Public Health Act of 1875, any local authority may, and, if required by the Local Government Board, shall, provide a mortuary, and may make by-laws with respect to the management and charges for its use. They may provide for the decent and economical interment of any dead body received into a mortuary. To this mortuary a justice may, in certain cases, order the removal of a dead body. The local authority may also provide a place for post-mortem examinations ("otherwise than at a workhouse or a mortuary"). Thus, it is to local sanitary authorities that we must mainly look for the establishment of these temporary resting-places for the dead.

When the local authority is unwilling to perform this necessary duty, or has difficulty in procuring a suitable site, another method might be devised for securing the establishment of a mortuary. Most hospitals make some sort of a provision for deaths occurring within their walls; and if sanitary authorities felt disposed to help, hospital managers would often be found willing to erect a somewhat more pretentious mortuary than they would otherwise have done, and to throw it open, under certain regulations, to the general public. The rapid extension of cottage hospitals leads one to hope that this method of securing mortuaries would satisfy the demands of a large and increasing number of places. It is a common practice for local authorities to subscribe to hospitals—especially to infectious hospitals—provided by private enterprise; and I am not aware of any legal objection to the same power of subscription being exercised in the case of mortuaries.

Another method in which mortuaries—especially on the Continent—are provided, is to erect them in cemeteries. There is much to recommend this plan, both on the score of economy, and of regard for the public health. Such mortuaries are, of course, provided by burial boards, who need not be, and, as a rule, are not, the sanitary authority of the place. Whilst, however, section 142 of the Public Health Act grants the power of the compulsory removal of dead bodies to a mortuary provided by a sanitary authority, it does not do the same in the case of a mortuary provided by a burial board.

It may be worth consideration whether, in the establishment of all new cemeteries, provision should not be made in the plans for a building, of a nature of a mortuary, to receive dead bodies preceding interment.

We have next to consider the question of *situation*. On this much needs to be said. Whenever possible, the mortuary should, of course, be separated by a belt of air from all dwelling-houses; but no injury has been found to follow the use of those in very crowded neighbourhoods, even when they abut on the street. The mortuary in Drury-lane, the walls of which are brought up flush with the pavement, is an instance of this. The Drury-lane mortuary, like a great many others in the metropolis, has been built on an old disused burial-ground; and, certainly, these spaces, occurring as they do in the most crowded parts of the town, afford a very convenient site for mortuaries, a site, too, which the ordinary prejudices of people against the establishment of receptacles for the dead in their midst can hardly reach.

Wherever possible, a mortuary should be screened from the road by trees or shrubs, and should be approached by a winding path also planted with shrubs.

The internal arrangements and fittings are most important. There should be ample means of ventilation provided for every part of the building; and the mortuary, though not made too bright by window space, should not be gloomy or depressing in appearance.

Though, of course, a mortuary proper would consist merely of a dead-house, it is very desirable, and indeed essential, that connected with it should be a room for post-mortem examinations, and another for the holding of coroners' inquests. For it must be remembered that a certain, and in some cases not inconsiderable, portion of the bodies brought into a mortuary will be for identification and legal inquiry, as of persons found drowned, or dead in the streets, murders, suspected suicides, unknown strangers at hotels, &c., and suitable provision must, therefore, be made not only for a skilled medical examination of the body to discover the cause of death, but also for the coroner and jury to hold inquests on the bodies.

The size of the mortuary-room proper must, of course, be large, and will depend upon the population of the district for which it is to serve. Space for some twelve bodies has been held by Dr. Hardwicke, the able and energetic coroner for Central Middlesex, to be quite sufficient for a large town. The bodies may be placed in shells or coffins resting either upon tables covered with zinc or other impermeable material, or upon trestles, or upon movable iron brackets fixed round the walls. At some of the London hospitals catacombs the size of the coffin, and made of slate or brickwork, are used; and for certain purposes these may be found useful.* Since some of the bodies are certain to be brought in an advanced state of decomposition, a stock of charcoal and disinfectants should be kept. Cloths for covering the dead, which should be frequently saturated with disinfectants, should be provided.

The post-mortem room may adjoin, but should be quite distinct from, the mortuary. This separation is needful in order to comply with the terms of Section 143 of the Public Health Act, which, whilst giving powers for the erection of post-mortem rooms, distinctly requires that they must be provided "other than at a workhouse or a mortuary." It is only necessary, however, to take care that the post-mortem room is distinct from the mortuary (*i.e.*, that it is walled off from it, has a separate entrance, and is cut off from it in other ways), to comply with the Act of Parliament. As to the fittings of the post-mortem room, Dr. Hardwicke recommends that the post-mortem room should be used only for the uncoffined or unclaimed bodies awaiting identification, and ought to be kept cool in summer by a supply of cold water; the corpse having sometimes to be preserved as long a time as possible from decomposition. This room should be furnished with special appliances necessary for post-mortem examinations; a marble or slate slab, with sides sloping towards the centre, converging into a drain below, so that fluids may not run over the edges; a sink with a plentiful supply of cold water; an iron bowl; a coarse sponge; a jack towel, a wooden yard measure; and, for the weighing of organs and structures, a set of weights and scales; a slated footboard around the slate table, on which medical men making post-mortem examinations may stand free from the damp or cold floor. Gas should be laid on, so as to procure warm water, or as it may be found necessary to make the examination at night, or when the darkness of winter days may obscure the view of the subject.

Speaking of the regulation of mortuaries, the subjoined rules in force at the mortuary provided by the Islington Vestry in the Chapel of Ease grounds, Holloway-road, were quoted:—"The dead body shall be inclosed in a proper shell or coffin, such being the shell or coffin in which the body is to be buried, and shall be conveyed to the mortuary chamber, and also removed therefrom in a hearse, or otherwise in a decent and proper manner, and the undertaker or friend shall remove the dead body for interment within an ordinary specified time. In case the undertaker or friend fail to remove the dead body within the time specified, notice shall be given to the relieving officer of the parish to bury such body at the expense of the poor-rate, such expense being subsequently recoverable from the parties legally responsible. A body having been brought or sent by any person whatsoever to the mortuary in a shell or coffin, such shell or coffin shall, under no circumstances, be removed other than for the burial of the body contained therein, unless such shell or coffin with the lid be properly lined with tinned copper. Should any shell or coffin sent with a body prove to be in a defective condition, a thoroughly sound and larger shell must upon notice be supplied, in which the defective shell can be inclosed, or in default the sanitary superintendent shall order a proper shell to be provided, and the expense will be recovered from the party sending such defective coffin."

As to the reception of cases, Mr. Burdett says there is a useful rule at the mortuary at Dean-street, Soho, empowering the attendant to receive a body without an order (otherwise necessary from a member of the Burial Board), if it be accompanied by a policeman or known inhabitant. At the mortuary in Drury-lane there is a rule forbidding the admission of any public procession or large assemblage of persons into the grounds on the occasion of the admission or removal of the body. Only the immediate relatives, the undertakers, and bearers are allowed on the premises A commendable rule, which deserves imitation.

Practically it would be found best to impose no limitation on the hours of reception when the bodies are to be received, as it may often happen, especially during epidemic periods, that it is essential that the body of a person dead of infectious disease should be removed instantly.

No charge should be levied on the relatives of the persons whose bodies are deposited in the mortuary, as it is very important to encourage its use as much as possible.

Lastly, comes the question whether or not it is necessary in providing mortuaries to have a separate chamber for infectious cases. This separation will not usually be found necessary, though there is an additional precaution when it is done. All infectious corpses ought certainly to dealt with as at Hackney, and should be screwed down as soon as possible, a piece of glass being let into the lid of the coffin in cases where it may be considered expedient or be desired by the relatives. The public ought to have easy access to the mortuaries, and every reasonable facility should be offered them for so doing.

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THE TEMPLE-BAR MEMORIAL.

We print below a correspondence which has taken place between Mr. G. E. Street and the Chairman of the City Lands Committee, respecting the alleged approval by the architect of the new Law Courts of the design adopted for the useless and unhandsome memorial, or refuge, which is in future to block the thoroughfare in the Strand. If anything of the nature of a "refuge" had been wanted, the proper place, as Mr. Street persists, was a hundred feet further westward, where the thoroughfare is wider, and where passengers entering the principal entrance of the Law Courts would be likely to use it. Everybody knows very well that it will be useless, in the way, and inartistic. Its ultimate fate—if it is not blown up before by a conspiracy of enraged omnibus-drivers, will be that of a similar piece of folly—the Wellington Clock Tower, which, after a useless existence of some years' duration at the southern end of London-bridge, was at last removed piecemeal.

At a meeting of the Court of Common Council on Thursday week, Mr. Bedford, the Chairman of the City Lands Committee, in reply to some inquiries, made a statement with regard to the memorial. The greatest care, so he asserted, had been taken to consult the public interest in the matter, the subject having been submitted to a conference of all the bodies concerned. At this conference the Government were represented by Mr. Street, the architect of the new Law Courts, as well as the Messrs. Child and the Commissioners of Sewers, and it had been unanimously agreed that the memorial should be erected. It would be useful as a refuge to foot-passengers, and, he believed, would in no way interfere with the traffic. There would be room for two carriages on each side of the memorial, whereas under Temple Bar there was only room for two altogether. The memorial, besides being handsome, and a really beautiful work of art, would mark the boundary of the city. The following correspondence has since appeared in the *Times*:—

Sir,—Mr. Bedford's statements on this subject require correction at my hand. At the meeting to which he refers—held some three or four years ago—the memorial now in course of erection was not so much as suggested. At that time we were told that some ornamental lamp-posts would suffice, and, to such a proposal, I, of course, had no objection to offer. It is very surprising, therefore, to be told by Mr. Bedford that the memorial now being erected was "agreed with complete unanimity to be the very best in all the circumstances of the case," and that I was of that opinion.

Not less surprising are Mr. Bedford's statements about the space for carriage traffic. No provision was ever made for the five lines of traffic of which he speaks. But provision was made out of the land purchased for the Courts of Justice for an addition of six feet to the roadway in the Strand (which gave space for four lines of vehicles), and of five feet to the foot pavement, the latter being intended to be 15 feet in width—not an inch too much for a pavement which has to accommodate, not only the crowd ordinarily passing along the Strand, but also the people having business in, and the inevitable loungers in front of, the Courts of Justice when the Courts are sitting. The simple fact is, I regret to say, that the whole of the space for the proposed memorial—five feet—has been taken out of the foot pavement on the north side, which will now be reduced to ten feet in width, to the great damage of the appearance of the new Courts of Justice, and to the great inconvenience of the public. The right place for a refuge is undoubtedly about 100ft. to the west of the memorial. The roadway at this point being wider, would admit of a larger refuge, and it would much better serve the convenience of passengers to the most important entrance of the new courts.

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* In certain cities of the Continent there are mortuary chambers in the form of separate cells completely isolated, in which it is contemplated that families can mourn and watch their dead until the time comes for interment.

I have never had any chance of seeing the design for the proposed memorial. I am glad, however, to believe that it will be, as Mr. Bedford says, a beautiful work of art: and I only wish that it could be erected with as much regard to convenience as to beauty and sentiment.—I remain, Sir, your obedient servant,

George Edmund Street.

14, Cavendish-place, W., Sept. 24.

Sir,—I have read Mr. Street's letter in *The Times* of to-day relative to the memorial in course of erection on the site of Temple Bar, and, as one of those present at the meeting in the Middle Temple referred to, I wish to confirm Mr Street's statement that the merits or demerits of such a building as is now being erected were not in any way discussed on that or any other occasion that I am aware of.

Had such a proposal been suggested there would most certainly not have been that unanimity boasted of by Mr. Bedford, as, unless my memory very much deceives me, the majority of those present appeared to think that a post and chain which could be put up and taken down at pleasure on occasions when such obstructions were required at City ceremonials, would answer the purpose of sufficiently marking the City boundary at this spot. In fact, the whole affair connected with this memorial has been a hole-and-corner business between certain City officials, and this has been the first opportunity the public has had of expressing any opinion on the subject. Why has no one been permitted to view this "wonderful work of art"? When once erected, like the Wellington horse astride Burton's arch, the public will be told it is too late to express an opinion on the subject, and that it must now remain where built at such a fabulous cost, to be the laughing-stock of ages to come.

It is simply disgraceful, after having rid ourselves of the old Bar, and after the sacrifice of valuable space gratuitously made by Messrs. Child and Co. for the benefit of the public, that the roadway gained should be appropriated for the glorification of certain City officials, and occupied by another obstruction—namely, the memorial in course of erection.—Your obedient servant,

September 25. C. F.

Sir,—Mr. Street has evidently not a retentive memory, or he could not possibly have made the statements contained in his letter of Saturday. He states that at the meeting alluded to "the memorial now in course of erection was not so much as suggested," and that he was told "that some ornamental lamp-posts would suffice."

Anything more astounding I have scarcely ever read. A memorial such as that now being erected was not only suggested and approved, but even some of its details discussed. To prove this was the case, I have now before me a letter, dated March 23, 1877, from Mr. Pownall, Messrs. Child's surveyor, in which, alluding to what took place at the meeting held at the Temple on the 5th, he says: "The understanding is that a rest will be formed in the middle of the road for the erection of a pier or column of an ornamental character as a memorial of its being the site on which the Bar stood." Not only so, but I remember very distinctly that I myself expressed a hope that its architectural details would be in entire harmony with the adjacent Law Courts. I even suggested that the finished design should be submitted to Mr. Street for his approval as regarded details, but this was overridden on a question of professional etiquette. One suggestion was that it should be somewhat in the form of a Queen Eleanor cross, but eventually the design was left to the City architect.

I do not very clearly follow Mr. Street's statement about the foot pavement; but even supposing it to be, as it possibly is, quite correct, I think all will agree with me that a refuge of 5ft. in width in the middle of the roadway will be more protective of life and limb than an addition of 5ft. to the footpath opposite the Law Courts. As the memorial will be finished in a very few weeks, it is, of course, needless to express any further opinion as to its probable results, but I do know that the intention was, and the hope of the Corporation is, to use Mr. Street's words, "that it should be erected with as much regard to convenience as to beauty and sentiment."

"C. F." does not give his name, but a Mr. Fane attended the meeting at the Temple, representing with Mr. Pownall, Messrs. Child. If "C. F." be that gentleman, perhaps the above extract from their surveyor's letter will convince him that, as he seems to fear, "his memory has very much deceived him."—I am, &c.,

Guildhall, Sept. 27. John T. Bedford.

Sir,—Mr. Bedfoid says I have not a retentive memory. He gives us the date of the meeting which I attended in the Middle Temple, and I have been able now to refresh my memory by an entry in my diary made the same day. It is as follows;—"Then to meeting at Treasury of Middle Temple to meet City authorities about Temple Bar. They are prepared to move the Bar, and only put a post to mark their boundary." My memory is not, therefore, at fault, and I recollect that the chief spokesman on behalf of the City was Mr. Rudkin, and that he spoke of a highly ornamental lamp-post or posts.

On the other more important point Mr. Bedford admits that I am right, and that he was wrong in his statement made to the Common Council. If he does not follow me exactly it must be because he has only learnt a few of the facts from others. He will find on further inquiry that the pavement on the north side of the Strand for a length of 170ft. will have to be reduced from 15ft. to 10ft. in width, in order to allow of two vehicles passing abreast eastward from the Strand to Fleet-street, and that this reduction in width is solely caused by the desire to erect the memorial on the exact site of the Bar, instead of on the most convenient spot. In one of Mr. Bedford's letters I see that he regards the memorial as an erection which will be a "joy for ever." If so, it will surely require some protection from the rude attacks of heavy waggons, and, in addition to the 5ft. which the memorial is to measure, there must be another deduction from the carriage-way for posts of some sort outside its base. Mr. Bedford evidently mixes what was proposed at the meeting of March 17 and what was afterwards elsewhere talked of and suggested, and of which I have no knowledge. The letter of "C. F." in the *Times* entirely supports my positive contradiction of Mr. Bedford's statement, that anything like the memorial now in course of erection was suggested and agreed to with complete unanimity by us. The meeting was attended by a number of professional men. No plan or design of any sort was produced, and we had to trust to Mr. Rudkin's words for our ideas of the proposal. It is absurd to suppose that any body of men would unanimously approve a scheme so vaguely described that while some of us thought it was for an ornamental lamp-post, others thought it was a solid structure adorned with statues and other elaborate details!

In his speech to the Common Council, Mr. Bedford inaccurately said that I attended the meeting at the Temple as representative of Her Majesty's Office of Works. If he was present at the meeting he ought to know that I most distinctly disclaimed any such position, and stated that I had no authority from the First Commissioner to attend or express any opinion.—I remain, Sir, your obedient servant,

Georoe Edmund Street.

14, Cavendish-place, W., Sept. 28,

NEW SADLER'S WELLS.

We can confidently recommend those of our readers who may desire a real dramatic and artistic treat to go and see *Othello* at the New Sadler's Wells Theatre. We regret to learn that it is only to be continued for a few days longer, as the manner in which Mrs. Bateman has presented it on that stage is as excellent as it is unique, and fully deserves a longer and a successful career.

Miss Isabel Bateman, as Desdemona, and Mr. Hermann Vezin, as Iago, perform admirably their several parts in this grand, if not the most pleasing, of Shakespeare's tragedies. Mr. Charles Warner acts well, and is a striking personification of the noble Moor, save that his face is blacked rather like that of a negro than of the "tawny" Othello, and Mr. Walter J. Brooks is good as Roderigo. It is, however, in respect of some of what Mrs. Bateman modestly calls "those minor essentials," scenery, costume, and appointments, of which we desire to speak in terms of high commendation. Of the scenery, indeed, we could say nought, if not critical, and Brabantio makes a comic appearance at a Venetian balcony above a doorway, to the keyhole of which at least his extremities must reach. The best has perhaps been made of what was, and the council chamber at least has a quiet and dignified character, and forms a suitable background with its subdued dado and hanging tapestry above for the splendid group of the Doge on his Throne and Senators around him.

The costumes have been arranged by Mr. Edward W. Godwin, and are both archæologically correct and sumptuous and refined in effect. There is an entire absence of the theatrical tinsel and gaudiness which seem to spoil most attempts to reproduce on the stage the dresses of olden days. The figures resemble those in the Venetian portraits of the period, and are in harmony one with another. Brabantio is clad in a dignified cloak of black-figured damask, with long sleeves; and Iago and Roderigo in well-contrasting suits, the former with dark red hose, crimson sleeves, shaded with deep puce, showing through, and quiet grey vest, with white buttons, though objection might be taken to the apple green hose of the latter as rather too crude in colour.

The Doge in Council is superbly but simply attired, and properly without the ermine cloak, which is an outdoor official garment, in a refined long crimson dress, richly figured, with white buttons to the seam in front, from neck to feet, and on his head the gold and white broidered crown familiar to us from the fine portrait in our National Gallery.

On either side of this central figure are senators in varied scarlet and crimson and black dresses, and with black caps, forming a splendid combination of colour difficult to arrange, but happily accomplished; and the attendants in the chamber are in the garb of the Knights of St. Mark, than whom no lower rank of official could be permitted in that presence. Desdemona is clad in a rich dress of a subtle golden brown with shot sheen melting into purple in the shadows, with pearls for diadem, and festooned round her neck. To this, again, the dress of Emilia is an excellent contrast, being of black velvet, covering a broidered golden robe below. And last, but not least, Othello's majestic form is finely draped with damask of powerful design, which, though but stencilled, lacks no richness in general effect.

We have, in fact, throughout, a combination of quiet and subdued but charming colours, toned into richness, and heightened by concentration, which might afford a good lesson to those would-be colourists of the day who revel in sad and sober tints without being able to rescue them from dull and tedious monotony.

CHIPS.

The Lambeth vestry has resolved upon applying for a faculty to remove certain gravestones in the Lambeth burial-ground, and upon taking other steps, with a view to forming the place into a recreation-ground for the parish.

The memorial-stones of a new English Wesleyan chapel, now in course of erection at Conway, were placed on Friday. The style is timbered modern Gothic, the external materials being freestone, from the Bryncorarch quarries, with random-work. The external dimensions of the chapel will be 48ft. by 30ft., there being in the rear a schoolroom 40ft. by 24ft., a vestry 20ft. square, and a house for the caretaker. The entrance-porch is surmounted by a small spire in half-timber work. Accommodation will be provided for some 150 worshippers; but the schoolroom is so constructed as to be opened out to form a transept, to be utilised for another 50 during the summer months. The approximate cost is about £1,000, and the contract is being carried out by Messrs. Hugh Thomas and Ellis Hughes, Mr. Fraser acting as the clerk of the works. Mr. Curwen, jun., is the architect.

On Thursday week the foundation-stone of St. Peter's Church, in Yarm-road, Stockton, was laid by the Marchioness of Londonderry. The plans of the new church have been prepared by Mr. E. Clephau, of Stockton, the style being that of Early English. It will cost £5,000, and will seat 720 persons.

New school of art buildings are being erected at Penzance. Messrs. J. N. Julian and Sons, of Truro, are the contractors, and the premises will be opened with a fine-art exhibition early in the new year.

Professor Tyndall will deliver an address on the 25th inst, at the inauguration of the Glasgow Sunday Society, for the opening of museums, art-galleries, and libraries.

At the last meeting of the Milton-next-Sittingbourne Rural Sanitary Authority, reports were read from the health officers upon the state of the huts at Lower Halstow, erected by Messrs. Sutton and Ratcliffe, and which have been the subject of repeated complaints. The huts are situated in a low swampy spot, and are built of wood, with black felt roofs; there are no chimneys, the cooking being done by means of smoke pipes, which are carried through the roofs. The heat of the places during the summer months has been intolerable, and there are always pools of stagnant water lying close to the huts. The board directed that a peremptory notice should be served upon Messrs. Sutton and Ratcliffe to put the huts in a proper sanitary state forthwith, failing which application will be made to the justices to close them.

On Wednesday week a contractors' engine ran off the new line of the London and North Western Railway Company, now being made between Rugby and Northampton. Three men were injured, and one of these, Mr. Walter Scott, junior, the second son of the well-known railway contractor of Newcastle-on-Tyne, died the next day in Rugby Hospital. The deceased was only 22 years old.

A bazaar was held last week at St. Kew, on the north coast of Cornwall, in aid of the restoration of the parish-church, which has fallen into a state of disrepair that necessitates restoration. This work it is proposed to carry out early next year, at a probable cost of £1,100, and will include rebuilding of roof and reseating.

In reference to the article on "The Largest Bridges of the World," published on page 353 last week, Mr. James Brunlees, C.E., writes, pointing out that we have in Great Britain a longer bridge than that just built for the Orenburg Railway over the Volga. This is the railway bridge over the estuary of the Solway, near Annan, which is 1,740 yards in length, whereas the new Russian bridge is scarcely 1,624 yards long.

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ILLUSTRATIONS.

SIR FREDERICK LEIGHTON'S HOUSE AT KENSINGTON.—SKETCHES FROM LISIEUX AND BAYEUX. — VILLAGE SCHOOLS IN BERKSHIRE.—DESIGN FOR A CHURCH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES, NO. 7.—SIR FREDERICK LEIGHTON'S HOUSE AND STUDIO.

The private house and studio of the President of the Royal Academy of Arts, illustrated by us to-day, can scarcely be deemed to be a pure example of one architectural style, while, in its decoration and furniture, not only several styles, but several periods of the history of art are represented. The main idea, of course, in the planning here, as in all painters' houses, has been the studio. The greater part of the first floor is devoted to its appointments, and the chief or garden elevation of the house is governed by its requirements. No care seems to have been spared in providing a grand approach to it, and a small ante-chamber, or painting-room, as it is called, immediately adjoining its chief entrance, adds apparent size by contrast, giving at the same time a luxurious air to the entire arrangements. The studio itself is 58ft. long, and 25ft. wide, and has a gallery at the east end for statuary and hangings. A model's stair is conveniently arranged at this same end, having an entrance-door most suitably placed, as will be seen on the ground-floor plan, at the side of the house. Under the gallery Sir Frederick's colours and materials are carefully arranged in a purpose-made sort of cabinet, with endless compartments and pigeon-holes. A raised daïs below the great north window occupies the central recess on that side of the studio, and at the west end an apsidal recess continues the arrangements of the semi-circular bay of the drawing-room below. The general colouring of the walls in the studio is Indian red, the woodwork here, as in the rest of the house, being black and gold. The chimneypieces throughout are marble, inlaid in geometrical design, and the cabinets at the east end, in front of the gallery, are from the special designs of the architect. The large window already referred to, and of which we give several details, is glazed with two thicknesses of glass, both in the top and side-lights, the object being to prevent the too-rapid cooling of the air in cold weather. The sunlights are so arranged that no air can come in except when they are lit. The heating of the room is by three open fireplaces, and the blinds of the large window are of dense canvas (of the same colour as the walls) and fixed on rollers. The chief interest in the studio will be found in the large series of sketches in oil, arranged on the walls, illustrating scenes from all parts of the world, and recording reminiscences of the most varied character, but here hung side by side, while on easels, placed here and there, are portraits more or less in a completed stage, but all remarkable likenesses of important people. Of these the unfinished portrait of Sir Frederick Leighton himself, now being painted by his own hand, at once attracts notice. It is a life-like and truthful picture, showing how its author has aged since Mr. Watts painted the same portrait some three or four years ago. The top-lit painting-room outside the studio adjoins, as we have said, the main landings, and beyond, through the lattice gallery shown on our plan, most interesting peeps are obtained of the sumptuous Arab-hall beyond. The rest of the first-floor is occupied by Sir Frederick Leighton's bedroom and private apartments. The servants' bedrooms are over these, and are reached by the back staircase. On the ground-floor a large entrance-hall communicates with the library and staircase-hall. A very good view, showing the Moorish-like columns and corbelled girder to the landing and staircase, was published in the Building News for December 22, 1876, when we also gave views of Sir Frederick Leighton's dining-room and studio. Just now the ante-room adjoining the inner hall, as well as the painting-room over, are being lined with old Persian tiles of extreme beauty and admirably copied, for the making-good of the deficient parts and border by Mr. De Morgan, of Chelsea. The Arab-hall is certainly a splendid building inside, well worthy of the favourable descriptions given by those who have seen it, and doing credit to the several artists engaged in its completion. The hall was built as an adjunct to the house for the purpose of exhibiting on its walls Sir Frederick's large collection of old tiles from Cairo and Constantinople, and Eastern woodwork, as well as some stained glass windows from Damascus, and in this respect it is a very remarkable museum. The whole interior is thoroughly well done, and is finished with marble, gold mosaic, painting and gilding harmoniously combined in the true spirit of Arab magnificence. The capitals of the marble shafts are from Mr. Aitchison's designs, and were modelled by Mr. Boehm. The large gilt caps were by Mr. Caldecott, and the frieze of gold mosaic is from characteristic designs by Mr. Walter Crane. The marble work, including the fountain in the centre of the hall below the dome, has been executed by Messrs. White and Sons, of Vauxhall, the mosaic being the work of Messrs. W. H. Burke and Co. Messrs. Harland and Fisher, of Southampton-street, carried out the painted decorations, from the architect's designs. The plaster work was by Mr. Riche, and the painted glass by Mr. Ross, of Harrow. The general building was the work of Messrs. Woodward, of Finsbury, the builders. Next week we propose to publish two drawings of the Arab-hall, taken from those which Mr. Aitchison exhibited this year at the Royal Academy, and showing the decorations as completed. The ante-corridor to the Arab-hall to which we have already referred will have a black dado below the mural tiles now being fixed, and the ceiling, like the cornice, will be gilt. A mosaic pavement has been prepared for the floor, in the centre of which a pedestal of brocatello will be placed supporting a Roman figure in bronze. The drawing-room was designed for the exhibition of four fine panels of "Morning," "Evening," "Noon," and "Night," and of a circular sketch by De la Croix in the ceiling. The chimney-pieces, cabinets, some of the chairs and bookcases, were specially designed for this room by the architect to the house, who also designed the large sideboard and hooded mantelpiece in the dining-room. The exterior is faithfully shown by our view to-day, while the geometrical drawings carefully illustrate the planning and details of the house. The big window to the studio is chiefly of iron construction, with mahogany sash-bars and frames. The cornice is massively built of stone, of which material the main string and projecting balcony on the right are alone exclusively composed, the chief material, both for the Arab-hall and house, being red brick for the walls, with red tiles for the roof. Stone, however, is far more freely used in the road front of the house, where the building has a forecourt of about twelve or fourteen feet facing the Holland-park-road. A large garden extends to the back of the house and to the rear of Mr. Marcus Stone's house and grounds in the Melbury-road, and it adjoins the plot occupied by Mr. Val Prinsep, A.R.A., whose studio by Mr. Philip Webb will form the subject for the next illustration of "Our Artists' Homes Series." In conclusion, we may mention that two or three additions to the original design for this house have at different times been made. For instance, the gallery and projecting end has been added to the studio, and the north window for light's sake was changed from a similar structure of stone to the iron arrangement as we now see it. The Arab-hall has since also been entirely added. A good photograph of the house has been taken by Bedford Lemere, and the architect has likewise lent us several from the interior, so that by the aid of these and the working plans, we have been enabled to present our readers with a rather unusually complete set of illustrations of this remarkable house, especially if the drawings now given are taken together with those illustrated by us in 1876, already referred to, and those to be published next week. Mr. George Aitchison, B.A., of Harley-street, was the architect to the house, and the decorations throughout have been, and are still being continued, under his immediate superintendence.

SKETCHES FROM LISIEUX AND BAYEUX.

The sheet of sketches herewith published is the second of a series made in Normandy in 1877, of which the first appeared in the Building News for Sept. 10th. The first is a larger sketch of the gable to House in Rue d'Ouville, Lisieux, illustrated in the first sheet. The second sketch shows the tower between nave and chancel of the church at Villier-le-Sec, about 8 miles from Bayeux. The third is a sketch of a portion of the Priory buildings of St. Gabriel, about 1½ miles from Villier-le-Sec. The chapel here is a very perfect and rich specimen of Norman work, which, when I was there, they were restoring for no apparent reason. The last sketch is that of a dwelling near Glos, about 2 miles from Lisieux, used, I believe, as a farm-house.

A. H. S.

VILLAGE SCHOOLS, BERKSHIRE.

These two village schools, which we illustrate to-day, were erected a short time since from the designs and under the superintendence of the late Mr. William Penstone, architect, from whose drawings exhibited this year at the Royal Academy our lithographic illustration is taken. The school illustrated at the top of the page is at Stanford-in-the-Dale, and is used in connection with the parish-church there. The building is in stone. The other school was built by the School Board for Cholsey, near Wallingford, the materials being brick and tile.

QUEEN'S PRIZE DESIGN FOR A CHURCH.

Mr. Gilbert S. Doughty is the author of the design for a church, illustrated by us to-day, and for which, as a student of the Nottingham School of Art, he was awarded the Queen's prize for architectural design in the National Competition last year.

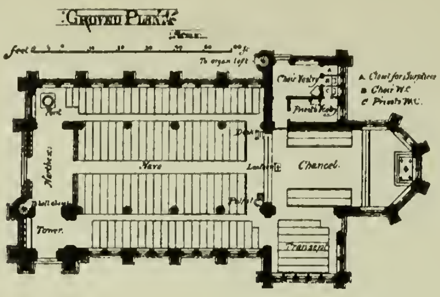
HOUSE AT STONEYGATE, LEICESTER.

Our illustration last week of this building was taken from a drawing exhibited at the Royal Academy this year. There are commodious stores, wash-house, and wine and beer cellars in the basement; the ground-floor contains dining, drawing, and breakfast-rooms, with spacious kitchen offices; the first floor contains bath-room, w.c., housemaid's closet, three bedrooms, and dressing-room; the attic floor contains a billiard-room and servants' bedroom. The lower portion of the building is faced with red tapped bricks; the upper portion is constructed with timber framing, coated with Stockholm tar, the spaces between being filled in with brickwork, finished with a coat of rough bronze plaster. The roofs are covered with Broseley strawberry-colour tiles. The works have been carried out by Mr. Nicholas Elliott, builder, from the designs of Mr. Isaac Barradale, F.R.I.B.A., Leicester.

◆

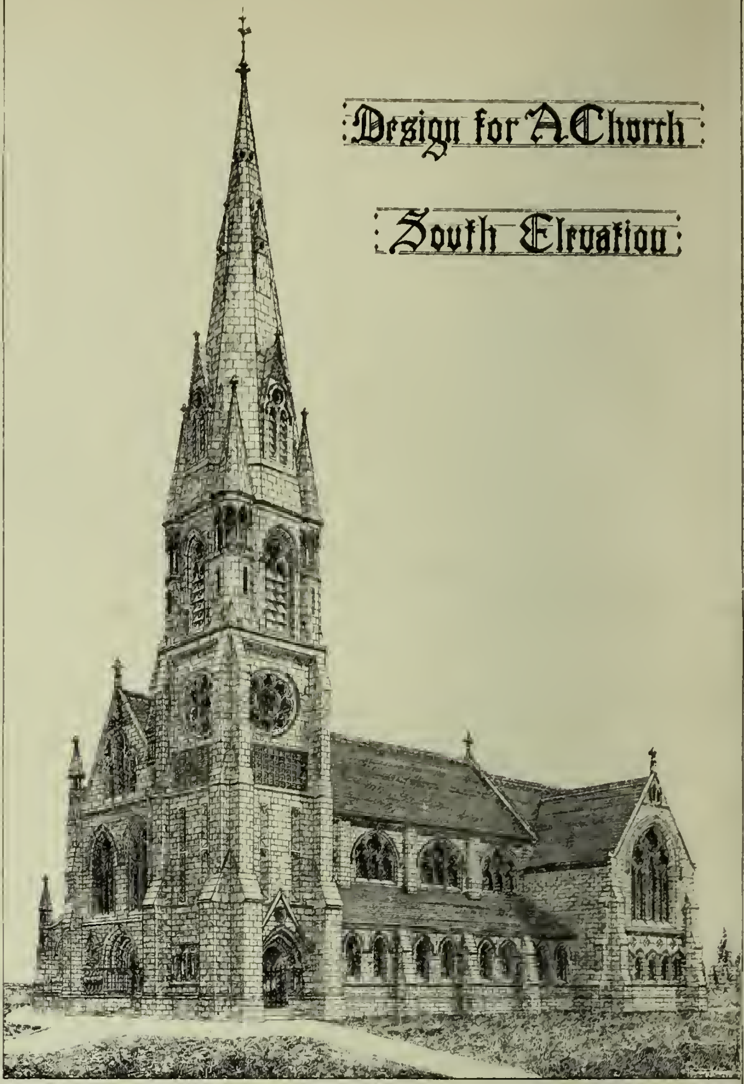
An extension of the Wigan tramways from Queen-street to the centre of the Market-place has just been opened for traffic, after inspection by Major-General Hutchinson, R.E., of the Board of Trade. It has been constructed from the designs of Mr. Charles H. Beloe, C.E., under the supervision of Mr. Bolton, borough engineer of Wigan.

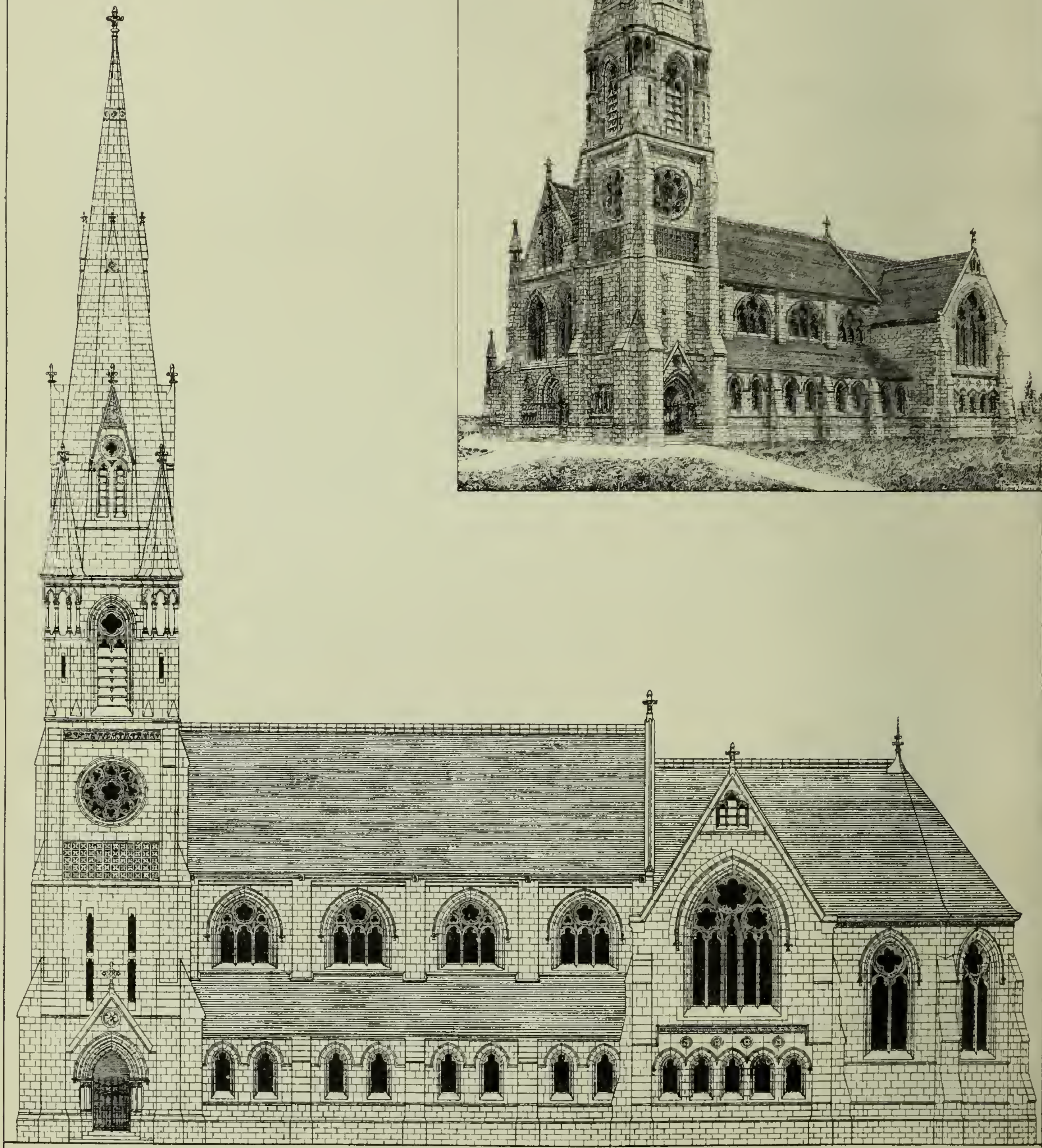
Mr. A. Arnold, one of the Local Government Board inspectors, held on Friday an inquiry at the Public Hall, Rusholme, into the application of the Rusholme Local Board for a loan of £6,000 for street improvements in the widening of Wilmslow and Dickenson-roads, about to be carried out under the supervision of Mr. Mangall, the surveyor.



Design for A Church

South Elevation





By Gilbert S. Doughty, Student of the Nottingham School of Art.

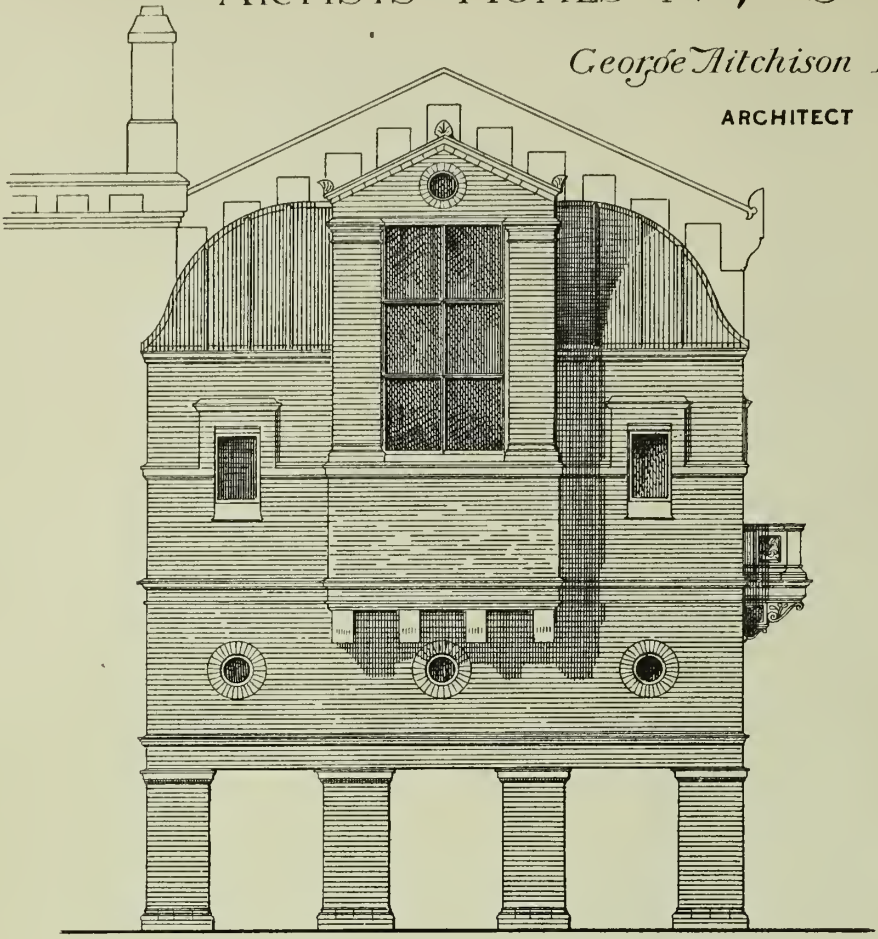
QUEEN'S PRIZE AWARDED

Photo Lithographed & Printed by James Akerman 6 Queen Square W C

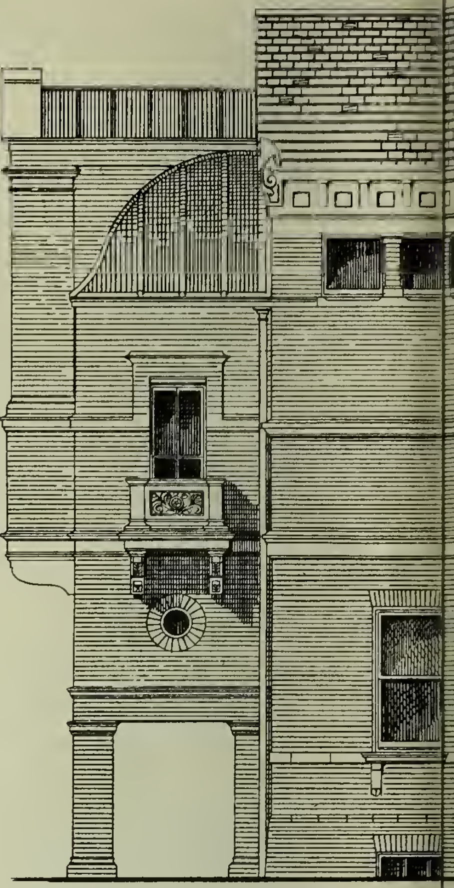
ARTISTS' · HOMES · No 7 · Sir Fredk Leighton P.R.A. ·

George Aitchison B.A.

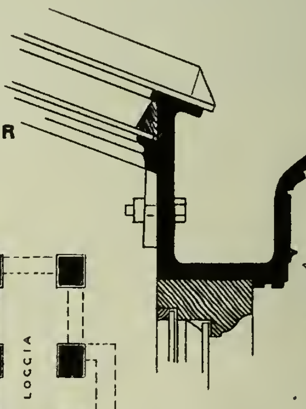
ARCHITECT



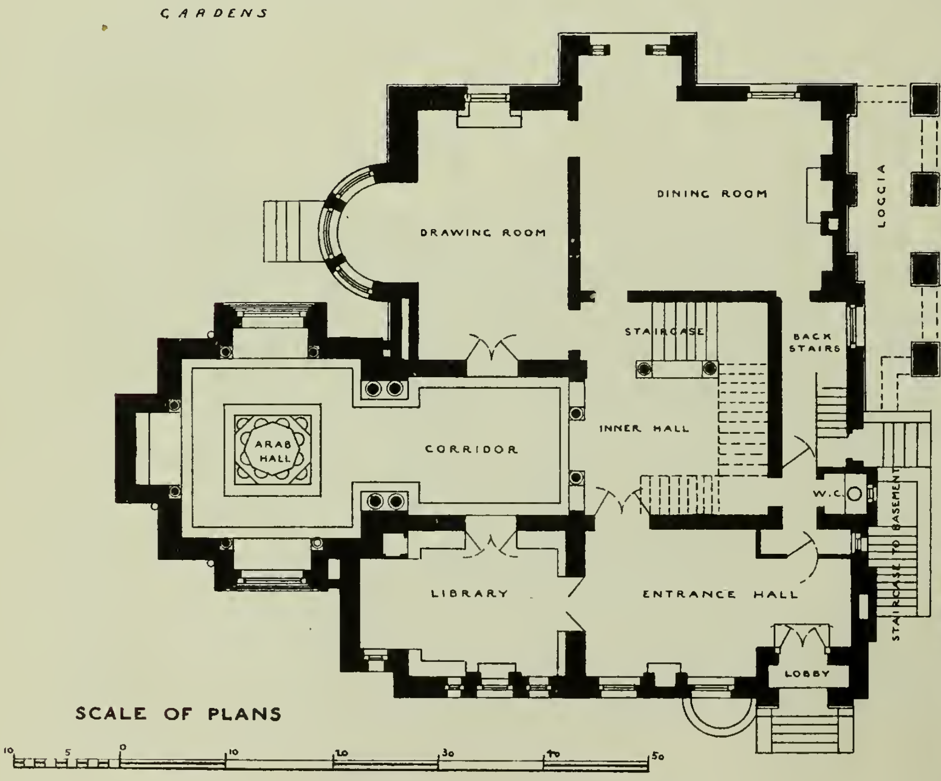
EAST END OF STUDIO



NORTH EL

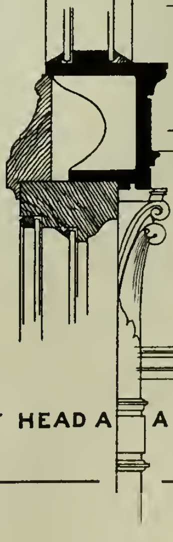


SECTION OF GUTTER



SCALE OF PLANS

GROUND PLAN



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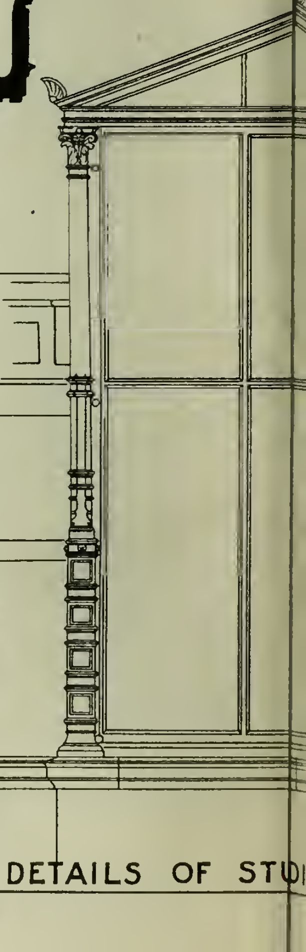

DETAILS OF STU

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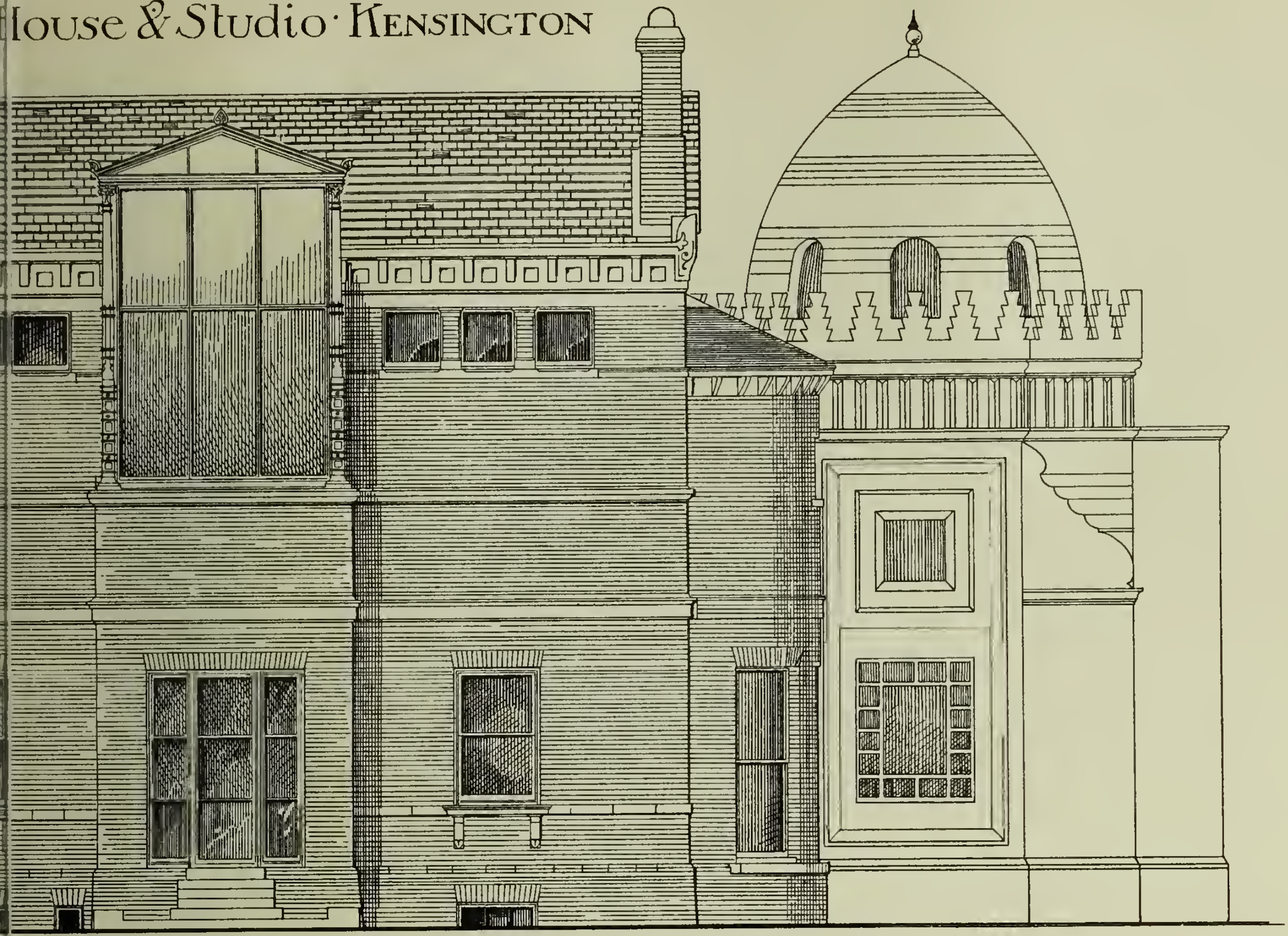
louse & Studio · Kensington



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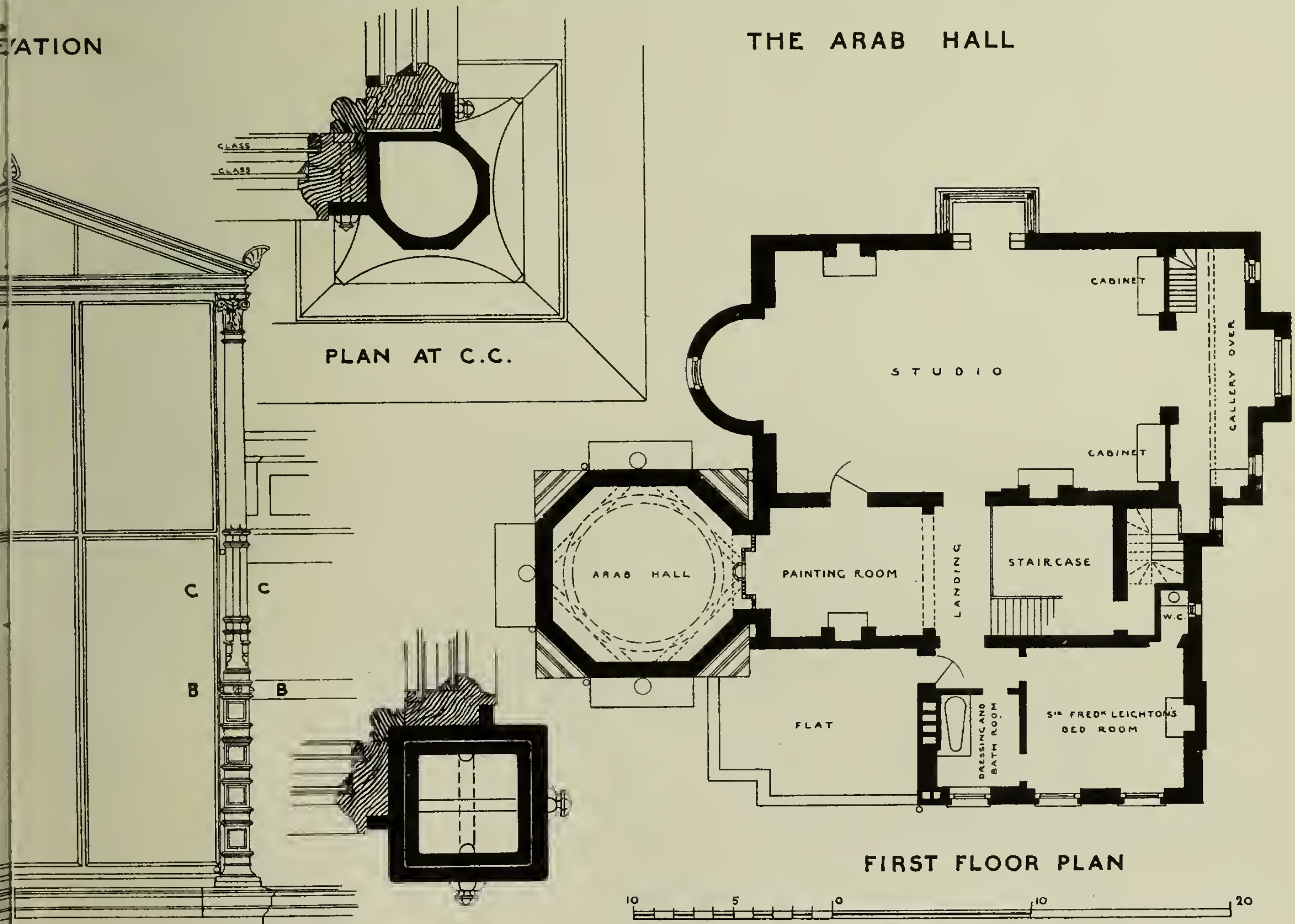
THE ARAB HALL



PLAN AT C.C.

FIRST FLOOR PLAN

SECTION AT B.B.

SCALE TO ELEVATIONS

DIO NORTH WINDOW

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

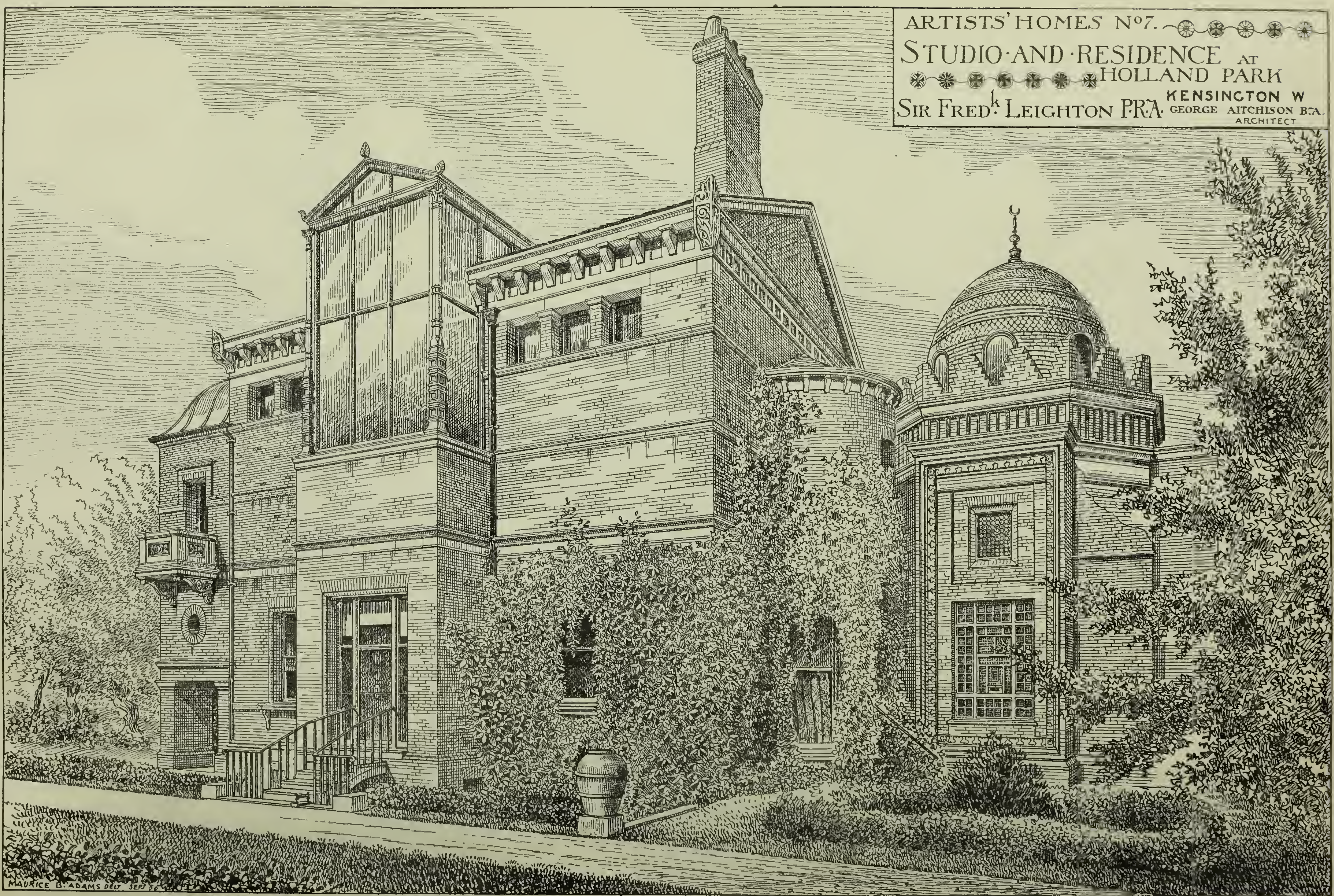
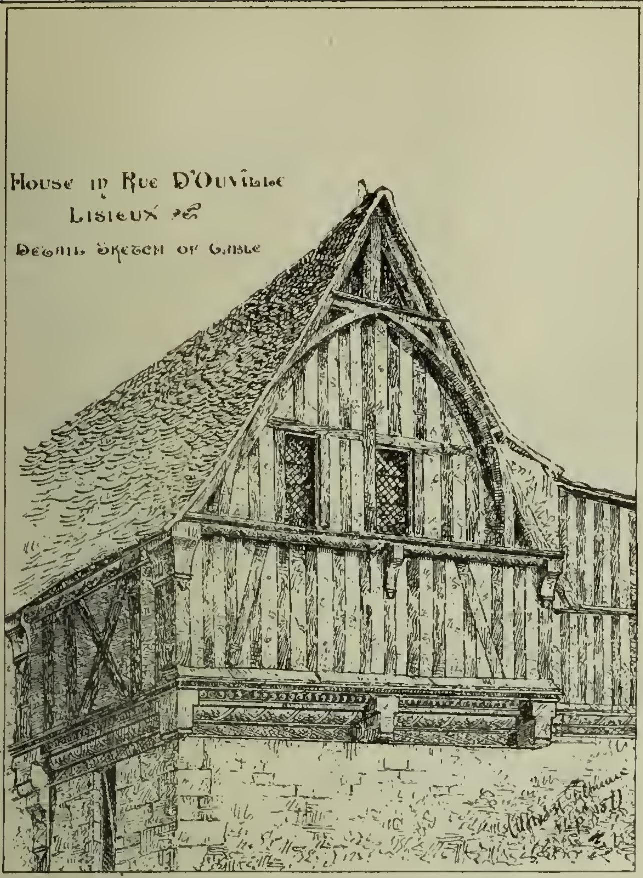
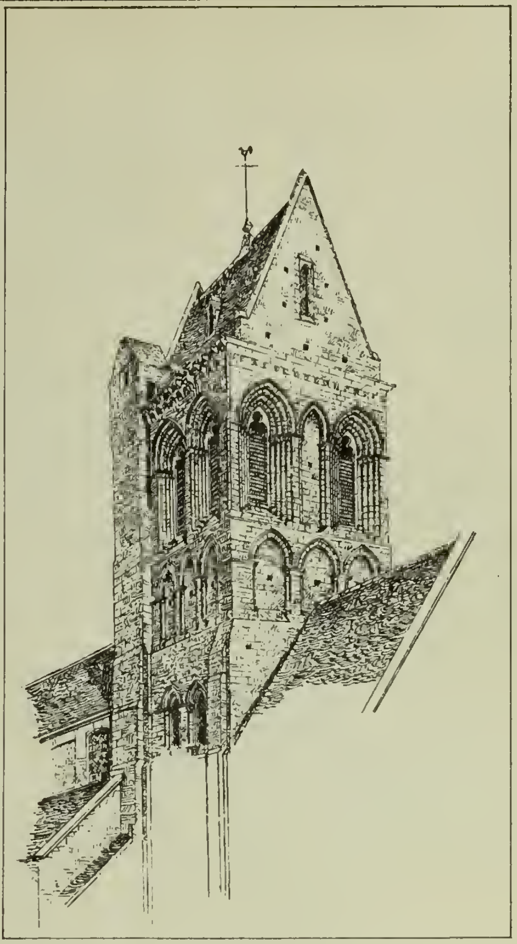

ARTISTS' HOMES No7.
STUDIO·AND·RESIDENCE AT HOLLAND PARK
KENSINGTON W
SIR FREDk. LEIGHTON P.R.A.
GEORGE AITCHISON B.A. ARCHITECT
MAURICE B. ADAMS DELT SEPT 80

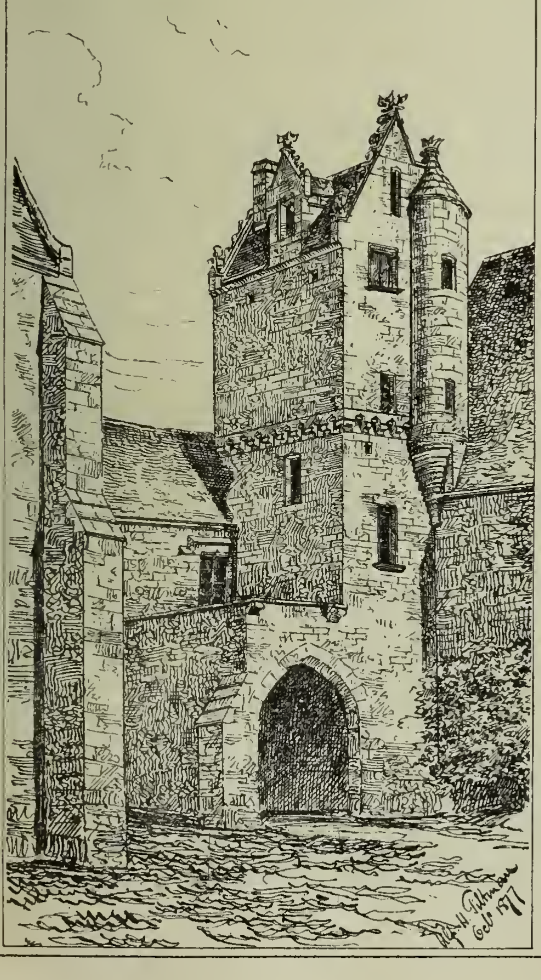
Photo Lithographed & Printed by James Akerman, 6, Queen Square W C

SKETCHES FROM LISIEUX & BAYEUX



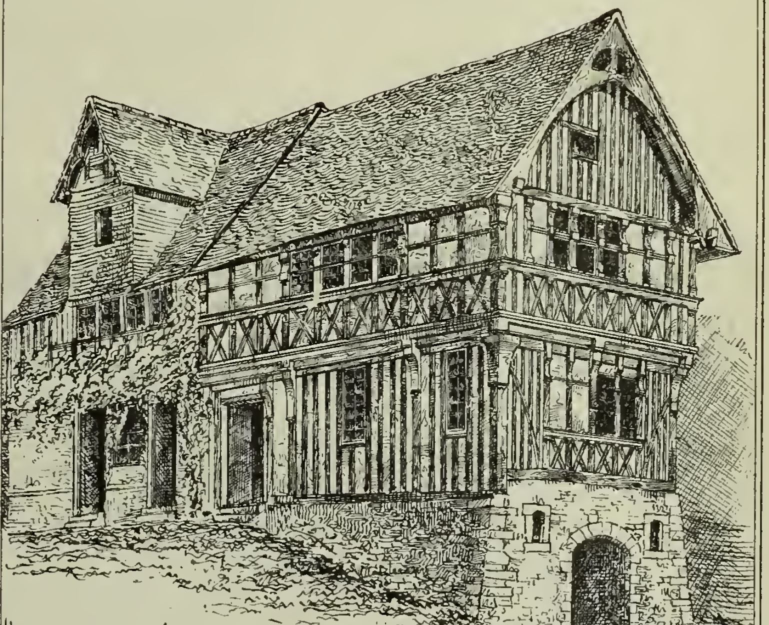
House in Rue D'Ouville
Lisieux &
Detail Sketch of Gable





The Priory of St Gabriel nr Bayeux

Alf H Tiltman
Oct 1877



House at Glos near Lisieux

Alf. H. Tiltman Sep 1877

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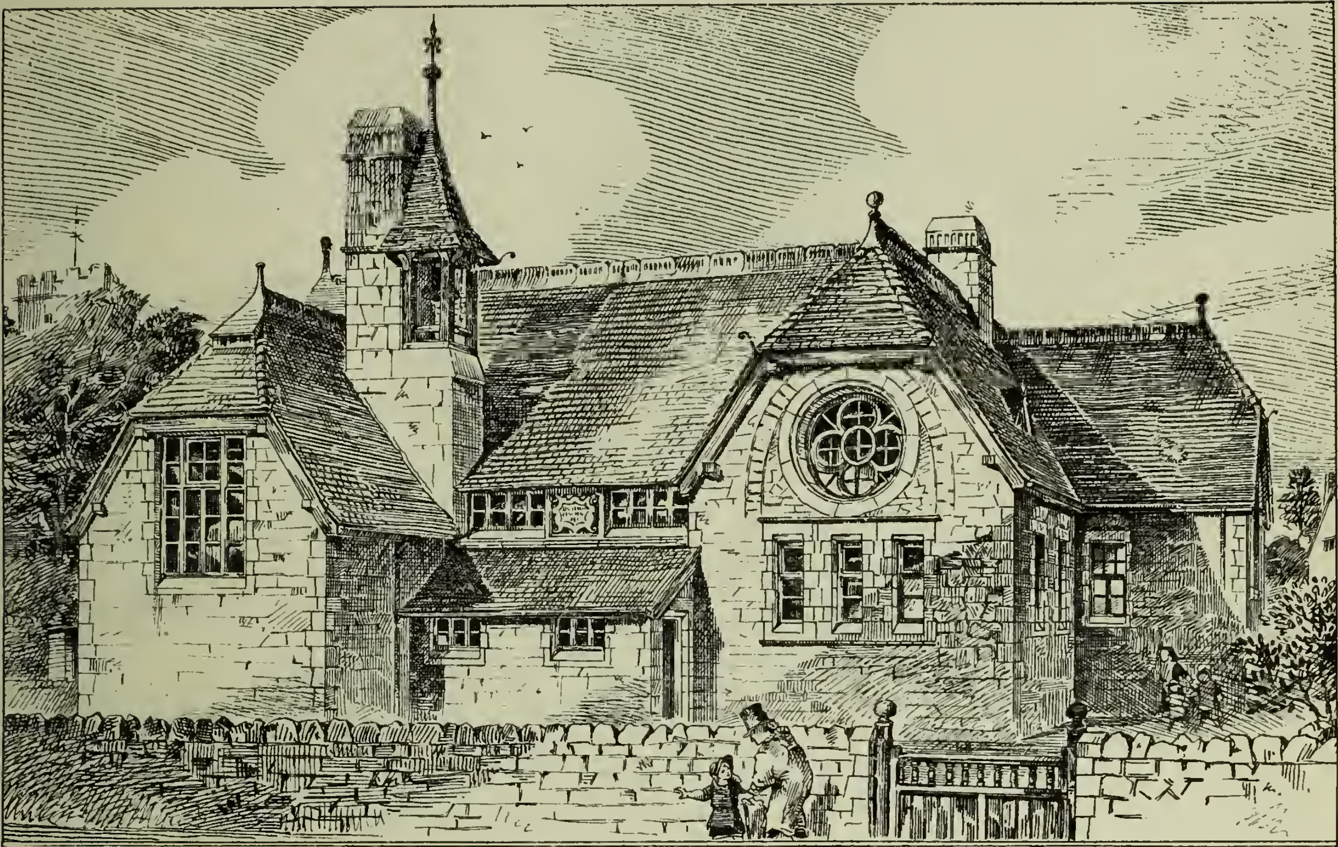
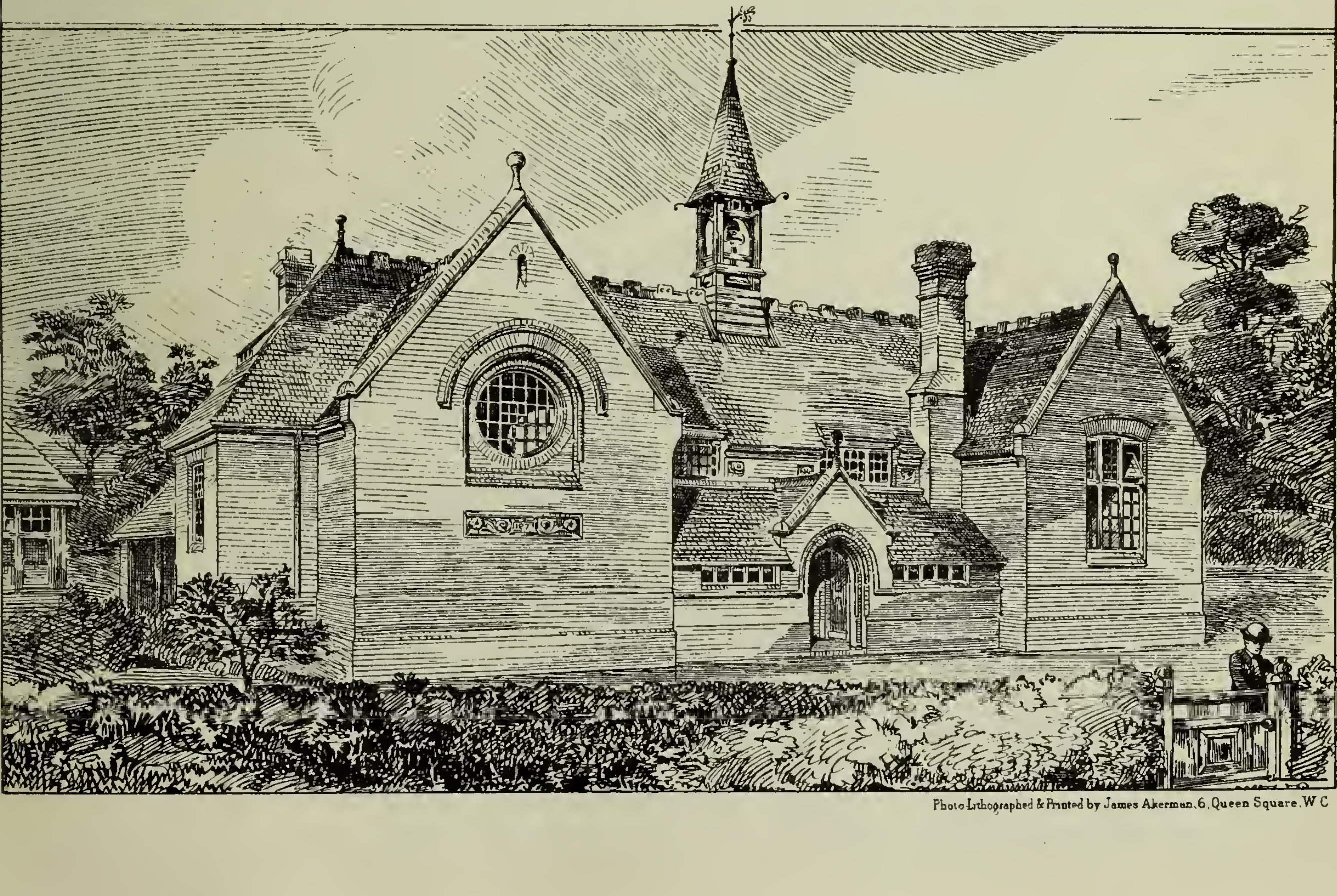
THE BUILDING NEWS, OCT 1 1880.



Village Schools . Berkshire — *William Penstone Architect.*

at *Stanford-in the-Vale* {Ch. E} stone.
Cholsey nr Wallingford {S.Bd} brick



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THE ASSOCIATION OF MUNICIPAL AND SANITARY ENGINEERS AND SURVEYORS.

A NORTHERN district meeting of this association was held at Darlington on Friday, under the presidency of Mr. A. W. Morant, Leeds, President of the association. The first business was the appointment of a secretary for the district, and to this office Mr. P. W. Thompson, Willington Quay, was unanimously elected. A paper was read by Mr. J. Craggs, of Shildon, on "Shildon Sewage Disposal." The subject was aranged under three heads—the main drain, the subsiding tank, and the surface preparation. The main drain conducted the sewage into the subsiding tanks. Under drains were formed some six feet deep. The sewage was conveyed from the tanks on the high plots in a 12in. carrier, from which it was let on to the land by Craggs's junction blocks, built into small cesspools, and thereby dispersed over the whole or any portion of the five acres by a trench ploughed parallel to the carriers. As the system was not yet working, criticisms were limited; but in reply to questions, Mr. Craggs stated that the land was rented at £7 10s. per acre, and the total cost of the work, according to the contracts, was £3,800. In the district, they had to deal with about 120,000 gallons of sewage. The farmers were anxious to obtain the refuse from the tanks. The soil was clayey, and he had tested a model tank for seven months and found it to work most satisfactorily.—A paper was read by Mr. Bell, of Felling, on "Sanitary Appliances." He dealt with the self-acting water-closet designed and patented by Mr. A. M. Fowler, of Newcastle, which he claimed had all the advantages of the ordinary water-closet without the intricate machinery. In this system there were three receptacles, one for garbage and two for dust; and it was held that by thus separating the liquid, the garbage, and the dry ashes, the nuisance connected with water closets was done away with.—Some of the speakers questioned the wisdom of having these receptacles, believing that people would not take the trouble to separate the refuse, and that there was no law to compel them to do so, but Mr. Fowler said the system had worked a great change in the sanitary condition of Salford, and had been successful wherever tried. After the discussion had ceased, the meeting adjourned to inspect the Darlington Iron Company's works, the Darlington sewage farm, the Park, and the water works.

THE SANITARY CONGRESS AT EXETER.

WE closed our report of the Sanitary Congress at Exeter in our last issue with the *conversazione* held on Wednesday evening, and now complete it with a summary of the proceedings of the following days. Thursday's business opened with a temperance breakfast and meeting at 8 a.m., and at 10 o'clock Mr. Rawlinson, C.B., gave an address in the Victoria Hall, as president of the Engineering and Sanitary Construction Section. He indicated the hidden dangers that might exist in the cleanest-looking country house or village, and urged that these concealed perils were far more deadly than exposed filth. Having shown the value of sewering in preserving the purity of air and soil in inhabited districts, he gave practical information as to the formation of sewers, and contended that perfect sewering required perfect street-paving and street-cleansing, and that these should never be contracted for, but should be worked by the local governing body. Turning next to the question of water-supply, he dwelt upon the danger of that derived from wells for drinking purposes, and insisted upon the necessity of the water-supply being sufficient to afford water for personal cleanliness; he considered that all waterworks should be, like the scavenging, in the hands of the local governing body. Amongst the papers read in the section was one by Mr. G. E. Waring, of Newport, U.S.A., on the "Sewerage of Memphis," carried out on the separate system, and which led to a discussion on the merits and disadvantages of this method. Mr. H. P. Boulnois, city surveyor of Exeter, contributed a paper on "Sewer-Gas Annihilation," and Major-General Scott, C.B., some suggestions on the cleansing of sewers, in which he recommended the use of lime in sewers for breaking up the slimy material of sewage and for absorbing its gases. In the evening, Dr. B. W. Richardson, F.R.S., delivered a lecture on "Woman as a Sanitary Reformer." He impressed on his hearers the necessity for making woman the active domestic health reformer, and said that the prevention of disease was a noble occupation, which could best and could only be performed by woman. The process of training by which women could so govern domestic life that diseases might be prevented wholesale was very simple. A woman could master physiology, could make herself acquainted with its nine systems, could tell the names and characters of the more common diseases, and know by sight those which were contagious, their period of incubation, and treatment in the sick-room.

On Friday the section of "Geology and Meteorology" was opened by an address from Sir Antonio Brady, the president, in which he dealt at great length with the poisoning of the air in large towns, and with the failure of modern sanitary legislation in England, a failure which he attributed to the pernicious permissive principle. He described how manure-makers, blood-boilers, chemical works, and other noxious trades had been driven from the East of London by the Metropolitan Board of Works into the adjacent and now densely-populated district of West Ham; and insisted that such trades should be restricted from passing noxious and offensive gases into the air of populous places. Legislation should be compulsory, not permissive, and sanitary officials should be appointed and protected in the discharge of their duties by the State. Mr. T. Andrews read a paper on "The Water Supply of Exeter," and was followed by one on "The Deficiency of Knowledge Respecting Health Resorts," by Professor G. Symons, F.R.S., who suggested the compilation of a standard work containing information on all mineral springs and seaside towns and villages. A general meeting of the Congress was held afterwards, at which Sir Stafford Northcote delivered an address, in which he pleaded—possibly from a vivid recollection of a Government which came into power avowing a policy of sewage based on the jingling solecism *sanitas sanitatem*, but which did next to nothing to justify the profession—that neither Parliament nor sanitary authorities could usefully outstrip the education of the people in sanitary matters, which was the primary duty of such a congress. In the evening a dinner was held.

On Saturday some excursions to the seaside were organised, and in the evening Dr. Bartlett delivered a lecture to the people on "Health Questions," in which he emphasised the necessity for removing the sewage of Tiverton and other towns, including Exeter, from the river—the source of water-supply to the city.

THE SOCIAL SCIENCE CONGRESS.

THE annual Congress of the Social Science Association will be opened at Edinburgh on Wednesday next, by a special service in St. Giles's Cathedral; and, in the evening, the inaugural address will be delivered at the Free Assembly Hall by Lord Reay, the President of the Association. The sectional meetings will be opened for the reading of papers and discussions on Thursday, and, on the evening of that day, the exhibition of paintings of the Scottish School, which has been organised by the Royal Scottish Academy, will be inaugurated. The discussions at the Congress will be conducted under seven sections and departments. That devoted to Health will be opened on Saturday, the 9th inst., by an address by Dr. John Beddoe, the Departmental President, and the special questions set down for consideration are as follows:—

(1) What are the best areas for sanitary purposes, and how far should there be a revision of the mode of electing and continuing the services of the officers under the Public Health Acts? (2) What is the best mode of amending the present laws with reference to existing buildings, and also of improving their sanitary condition so as to render them more healthy, having due regard to economical considerations? (3) What are the means which should be adopted for the prevention of the pollution of streams, without undue interference with industrial operations, and for the preservation of pure sources of water supply?

The Art Department is under the presidency of Mr. W. B. Richmond, the Slade Professor of Fine Arts in the University of Oxford, who will deliver his address on Tuesday week, the 12th inst., and the list of special questions is—

(1) Ought there to be a school of dramatic art subsidised by private subscription or endowment, or by the State? (2) How far would the revival of the old system of "Master and Pupils" be of advantage, and tend to promote the growth of historical art in the country, and the fitting use of painting and sculpture in our public buildings? (3) How can the musical education of the middle classes be improved?

The business of the Congress will be wound up on Wednesday, the 13th, and on that and the following day a number of excursions will be arranged.

THE LARGE PICTURE AT THE GUILDHALL.

LAST week a monster painting was exposed to view at the Guildhall, after having lain in an out-of-the-way corner of the Mansion House for many years. Occasionally, it is stated, the picture had been used as a screen at the Mansion House, where it had been neglected among other civic lumber. If this be true, the Corporation of London are as hopelessly blind to works of art as the corporations of insignificant boroughs are reputed to be, and the less they affect the promotion of art works the better. The present Lord Mayor, by whose order the painting, or, rather, pieces of it, have been collected, has set an example to his successors, and deserves the thanks of the public for bringing to light so important a painting. The subject is the "Battle of Agincourt." It measures 100ft. in length by 30ft. in height, has been cut or torn into three sections, of unequal sizes, and was painted, it is said, by Sir Robert Kerr Porter, when 19 years of age. In 1819 the artist presented it to the Corporation of the City by whom it has been so sacredly preserved! The condition of the picture, only about 60 years old, is disgraceful. The large fragment shows the battle between the French and English armies; it is crowded with spirited figures of soldiers in the thick of battle; some have fallen under the flight of arrows, and others are fighting with great vigour. One of the smaller pieces on the left is particularly noticeable for the bold scenery, with a castle situated on an eminence, and a well-painted group of horsemen in the foreground in deadly contest. The painting of the other portions exhibit a winding river among fertile meadows, and hills in the distance, with figures in the foreground. One section shows the retreat of the French army, and the other an advancing column of the English passing through a wooded country. Many of the larger groups of figures are well composed, and a good deal of animation is expressed. Through long neglect in damp and dirt the colours have become dull, but if restored the picture would rival many of its age. A committee, we hear, has been appointed to consider the best plan of restoring, and again exhibiting it, and it is proposed, owing to its great size, to mount it in sections.

A STEAM LAUNDRY AT BATTERSEA.

A NUMBER of architects, sanitary engineers, and medical men, together with some ladies, responded on Wednesday to an invitation to visit a new steam laundry in the Battersea Park-road, said to be the largest of the kind yet opened. The works have been erected for the London and Provincial Steam Laundry Co., which is affiliated to the Army and Navy Co-operative Society, and occupy a site of 1½ acres. They consist of several blocks of buildings, all top-lighted, and erected of stock bricks. An effort has been made to relieve the street frontage by breaking up the constructional lines, by the use of dressings of red brick, and by the insertion at intervals in the blank walls of panels of Brown's terra-cotta bricks, decorated with foliage and flowers, and the figure frequently repeated of a washerwoman at her tub. The more prominent gables are masked with half-timber work and rough cast. The works are entered at their western extremity by double gates, giving admission to a covered courtyard, under which vans can be loaded and unloaded. To the west is a detached building, consisting of office, with large dining-room above, and adjoining on the first floor, suites of apartments for the manageress and other employés; and general kitchen, dining, and sitting-room. Above are dormitories, separate washing utensils, a bath-room and w.c. being provided for each of the 24 occupants. Shut off from this residential block by a second pair of gates, is the main building, the laundry proper, which covers an area of 154ft. by 140ft., and is divided longitudinally into a kind of nave and aisles. Each side is on plan exactly a duplicate of the other, and is arranged so that it may be used independently in the dull season. When in full work, however, the articles to be washed, passing to the right, will make a complete circuit of the building, and the visitors saw, in progress, the several processes of examining, checking, marking, sorting, washing, rinsing, wringing by twirling in wire cages, mangling, calendering, ironing, drying, re-examination, and packing. The whole of the machinery has been made by Messrs. Thomas Bradford and Co., of Manchester and London, much of it being said to be specially designed for this laundry. Each operation is conducted in a separate room, well lighted from a ridge lantern extending the whole length of centre of room, and having louvred wood or swinging glass sides, according to the degree of heat required to be kept up. All the doors slide, economising space, and a series of tram-rails traverse the building on which the laden bins of clothes travel. The internal walls are throughout of brick, lime washed. The central hall, which measures 80ft. by 70ft., and is 20ft. high, is provided with 26 tables, heated from beneath by steam, and used for ironing, and in accordance with the general scheme, it can be shut off into two separate rooms if needed. Beneath the eastern end of the building are the boilers, and over these are placed the drying frames, each 12ft. in length by 7ft. high, and containing narrow iron "clothes' horses," which run in and out on small wheels set in grooves. From the boilers a series of steam pipes and coils are carried over the drying and packing portions of the laundry running beneath the shelves and tables. The engine-room below, on the eastern side of the building, contains two 14 horse-power horizontal engines, driven by the pair of 20 horse-power Cornish boilers already referred to, and the system of duplication is so carried out that either engine and boiler can work separately. In the engine-house is also a four-horse-power engine for pumping, and outside is the well, which is just completed. The boring is carried to a depth of 410ft., chiefly through blue clay and chalk; the greensands were pierced at 200ft., with but a scanty result in that stratum. The water rises to within 40ft. of the surface, and to provide against failure and accidents, a company's water is also laid on from the main. To the east also are the stables and van-sheds, with horsekeeper's rooms above, and a small detached block for the exclusive dealing with infected linen, which is received and despatched by a separate eastern entrance in special zinc-lined vans. To the north and west is an area as yet unbuilt upon, and used as a drying-ground. The buildings have been practically completed, and the work in partial operation, for nearly two months; but Wednesday was stated to be the first day on which the whole of the machinery was set in motion. Employment will be given to 20 male and 150 female hands, of whom 32 are lodged on the premises. Mr. Ernest Turner, of Regent-street, was the architect, and Messrs. W. Scrivener and Co., of Regent's Park, were the contractors, Mr. A. J. Gale acting as clerk of works; the quantities were taken out by Mr. Riddett.

SCHOOLS OF ART.

Walsall.—The 10th annual meeting of the Science and Art Institute took place on Monday week, when the prizes and certificates were distributed. The report set forth that the committee rejoiced in the facts, that out of Birmingham the institute was the largest and most promising in the Midland Counties; the art school and premises replete with every appliance, and the master fully qualified under the Government to teach in every department. The number of students was greater than at any previous year, the number of works sent up to the Department at South Kensington for competition had increased, and the works were of a higher character. The result of the May examinations brought a higher grant than last year, and the fees from students also showed an improved total. The Science Department had been from the beginning the more successful and popular of the two. The fact that more than 1,000 young men and women of Walsall and district had availed themselves of the advantages of the institution, and were still in some sense attached to it, augured well for the future of the town.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Berks Archæological Society.—An excursion was made on Wednesday week, by about 40 members of this society, to Padworth and Ufton Court. At the former village the parish-church was visited. It contains much 12th-century work of good character, some of it evidently executed by the hatchet. The chancel is apsidal, is covered by a stone-barrel vault now covered with plaster and yellow wash, and at the east-end a tomb dated 1711, and incircled by iron railings let into the centre of the inner wall, where the reredos should be. All the windows have been altered, those of the nave being Tudor, and those in the chancel a modern restoration. From Padworth the members walked to Ufton Court, formerly a manor-house belonging to Reading Abbey. It is a timber-built mansion dating from the 15th century, and largely altered by the Perkyns family who have owned it for 240 years.

COMPETITIONS.

Brighton.—A new church, with a tower and spire in brick, is about to be built at Brighton, at the east end of the town. A limited competition among four local architects, viz., Mr. E. E. Scott, of Brighton; Mr. Currey, of Lewes; Mr. J. Norton, of Old Bond-street, W.; and Mr. Somers Clarke, junr., of Westminster, was held, and the award has just been made in favour of Mr. E. E. Scott's design. The west front is boldly treated, and the church will hold its own, even at Brighton, where some remarkable churches have, during the last few years, been erected, notably those by Mr. Somers Clarke, junr., Mr. W. Emerson, and Messrs. Carpenter and Ingelow. The new church will be dedicated to St. Matthew.

Monument to Victor Emmanuel.—The Commission, appointed by Royal decree, to carry into effect the intention of erecting a grand public monument in Rome to Victor Emmanuel, have decided to throw the competition open to sculptors of all nations. According to the regulations published in the official gazette, no conditions as to design, style, or selection of site are imposed, the only stipulation being that the total cost of the monument when completed shall not exceed 9,000,000f. The model, which may bear the name and address of the sculptor, or a motto on the cover of a sealed letter, are to be sent in, addressed to the secretary of the Royal Commission at the Ministry of the Interior, not before the 25th of August and not later than the 25th of September, 1881. Three prizes of 50,000f., 30,000f., and 20,000f. will be given respectively to the authors of the three best models, which are to remain the property of the State; but the Royal Commisioners, in conferring these prizes, are not necessarily bound to give the commission for the monument to any of the prize winners.

Sculpture on Blackfriars Bridge.—At the meeting last week of the City Common Council Mr. James Edmeston, F.R.I.B.A., introduced the subject of the proposed competition for the four groups of sculpture to be placed at the extremities of Blackfriars Bridge, and moved "that it be an instruction to the Bridge House Estates Committee, to report their opinion and recommendation on the following points: the material or materials to be used, the total sum to be expended, and the course they propose to adopt in defining the principles of the completion, with the view of insuring a response from sculptors of eminence." The enterprise would cost from £24,000 to £25,000, and it was therefore, he contended, most important that everything should be made public and done in the fairest and most open way. The committee had, however, chosen to consult on sculpture a painter, Sir Frederick Leighton. That had "created a great deal of uneasiness, and apprehensions were felt that the whole affair might drift into a kind of job for a society of which Sir Frederick Leighton was president." This last sentence aroused loud cries of opposition, and the Chairman of the Committee having pointed out that the President of the Royal Academy was a sculptor as well as a painter, Mr. Edmeston's motion was declared to be lost on a show of hands.

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Mr. Frederick Jackson, civil engineer, Nottingham, is the engineer for the Arnold sewerage works, the list of tenders for which appeared last week.

Building Intelligence.

Bristol.—The foundation-stone of the new chapel for the Bristol Borough Lunatic Asylum, Stapleton, was laid on Friday. The plans of Mr. E. H. Edwards, of Clare-street, were selected, in a competition, from among those of several other local architects. Messrs. Forse and Ashley, Marlborough-street and Dighton-street, are the builders. The style is Norman Gothic, and the building will afford accommodation for 350 patients, and their attendants, at a cost of about £2,600. The chapel will consist of nave, 76ft. 6in. by 27ft.; transepts, 13ft. 7in. by 25ft. 3in.; and chancel, 40ft. 3in. by 22ft. The nave and chancel will be under one roof from end to end. The total internal length is 116ft. 9in.; and the measurement from the floor of nave to centre of roof will be about 45ft. The chancel arch will rest on either side upon two disengaged columns, carried upon corbels, and the wall above the chancel arch will terminate with a parapet running from north to south, instead of being continued in the usual way to the roof. The medical superintendent's gallery will be over the vestry, and will be approached by a newel staircase from the outside. Opposite this, on the south side of chancel, will be placed the organ. The floors will be laid with encaustic tiles, and the steps in the chancel will be of local and blue Pennant stone. The roofs throughout will be open timbered, and at the junction of the transepts there will be the flèche, which will be open to the top, and will be 80ft. high from floor to finial. At the western end is a porch, and north and south rooms for any patients who may be taken during the service with epileptic fits. The building will be constructed of Pennant stone, with freestone dressings, &c., and the internal walls will be stuccoed. The present chapel is being thrown into the dining-rooms.

Christ Church, Newgate-street, E C.—This church was re-opened last week after renovation and partial restoration. The stone columns in the arcades (about 30ft. high), previously all coloured over, have been scraped and restored to the original stone, which is Portland; the clerestory window openings, from which the principal light to the church is derived, have been filled with new cathedral glass in lieu of the old lead lights; the vaulting, which is only of timber and plaster, has been all recoloured, with the ornamental portions picked out. The back portions of the heavy galleries have been removed, and the internal appearance of the church is thereby considerably improved. The pewing, which is of solid oak, has been all scraped, cleaned, and varnished. The works have been carried out by Messrs. Hayward and Son, under the supervision and direction of Mr. Henry S. Legg, of Christ's Hospital. It is in contemplation, should the Bluecoat School (the boys of which now fill the galleries every Sunday) be removed to the country, to remove the heavy galleries, and also to re-pew the church.

Edinburgh.—The Barclay Free Church was reopened on Sunday after internal renovation and alterations. The whole of the seats in the area, which formerly had an upward slope to the pulpit, have been placed upon a level floor, and a new choir seat constructed. The pulpit has been lowered, and reconstructed of Caen stone, ornately panelled, while the reredos at the back of it has been considerably enlarged. The elders' seat below the pulpit is now separated from the area pews by a carved rail of pitch-pine, with quatrefoil ornamentation. The heating and ventilating arrangements have also been overhauled. Instead of hot air, the church is now to be heated with hot-water pipes—4,400 feet of which have been introduced, chiefly in coils in the passages and corridors. Fresh air will be introduced into the building through a system of pipes capable of regulation, the vitiated air being carried off into the tower. This part of the work has been effected under the direction of Dr. Russel and Dr. Smart. The other alterations have been carried out from plans by Mr. Pilkington, the architect of the building. The cost has been over £600.

Glasgow.—At a meeting of the Glasgow Dean of Guild Court on Friday, the retiring Lord Dean (Mr. Mirrlees) made a statement regarding the work of the Court for the year ended 31st August. He said there had been three years of great depression in the building trade, and last year had been the worst of all. Last year the value of the linings granted was £335,430, as against £755,717 two years ago. The average of the last three years was £514,000, whereas the average of the five years preceding came to £1,612,000. In other words, the entire value of the building operations in Glasgow during the last three years did not come up to the average of a single year of the five years preceding that time. That was a very deplorable state of matters, and whether it arose from over-building in previous years or from a diminution of the population of the city, it was hard to say. Probably both these influences were at work. The diminution in building appeared to be chiefly in the small class of houses, and chiefly those of one or two apartments. The greatest diminution of all, however, was in the shops. No new streets had been sanctioned, while in 1877 two miles had been made. The district in which there had been the greatest change was the northern district. The next worse district was the central. In the western district there was but a slight falling off.

Leicester.—The parish-church of St. Margaret is undergoing extensive repairs from designs by Mr. G. E. Street, R.A. It is a church of considerable interest, standing, as it does, on the site of the ancient cathedral of the bishopric of Leicester, which was in existence from 680 to 870. At the latter date the two sees of Leicester and Lindsey were united in the see of Dorchester-on-the-Thames, the see being again removed to Lincoln in 1067. Although Leicester is now in the diocese of Peterborough, St. Margaret's still preserves its connection with the older see by the fact that it furnishes a prebendal stall in Lincoln Cathedral. The oldest part of the existing church consists of the bays at the east end of the nave, which date from A.D. 1200, when the church was cruciform, with narrow aisles. Transepts were added and the nave heightened and the aisles widened in the following century, while in the 15th the tower, chancel, clerestory, and porch were added. In the chancel is an exquisitely-worked alabaster effigy of John Penny, a former abbot of Leicester, and subsequently Bishop of Bangor and Carlisle. Leland speaks of St. Margaret's as the fairest parish-church of Leicestershire, and Brand speaks of the bells as a noble peal of ten.

Port Seton, N.B.—The memorial-stone of the new harbour works at Port Seton, in the Firth of Forth, was laid by Lady Elcho, on Friday. The enterprise now completed is virtually a restoration of an old harbour wrecked by a heavy ground-swell in 1803, and since allowed to fall into ruins. The site has been granted at a nominal rent by the Earl of Wemyss, who also contributed £2,000 towards the cost of the construction, the remaining £9,000 being borne by the fishermen in weekly payments. The new harbour embraces an area of about seven acres, providing anchorage for 200 boats. In carrying out the plans, which were prepared by Messrs. D. and T. Stevenson, C.E., of Edinburgh, the principal work has been the erection of breakwaters that shelter the harbour on the east and west. The pier on the east side is carried out 200 yards, and at its seaward extremity is curved round so as to face the north, and run in towards the western breakwater, which is only 130 yards in length, and from which it is separated by a distance of 125ft., forming the entrance. In the construction of these breakwaters Portland cement concrete has been used, the material being run in a liquid state into huge moulds formed of wood on the site itself, so as to construct an entire pier as one great block. Along the top of the piers, which are 25ft. in breadth, lines of rails have been laid, in anticipation of the development of a mineral trade. In the basin of the harbour much blasting had to be undertaken after the sand that lay on the top of the rock had been removed—the excavations thus accomplished having amounted to about 30,000 cubic yards. At spring-tides the water in the harbour will reach a maximum depth of 16½ft. The contractors for the work were Messrs. A. Morrison and Son, Edinburgh.

Thorpe, near Sowerby.—The new church of St. John the Divine, at Thorpe, in the Ripponden valley, was consecrated on Thursday week by the Bishop of Ripon. It has been built at a cost of nearly £6,000, from the designs of Mr. W. S. Barber, of Halifax. The style is Perpendicular, and the plan consists of a nave without aisles, 81ft. by 31ft., chancel, 34ft. by 25ft., organ chamber, and vestries for the choir and clergy. There is accommodation for 300 persons. The seats, pulpit, &c., are of oak; the reredos is in Caen stone, by Messrs. Emms and Martin, of Cheltenham, representing Christ bearing his Cross, the Crucifixion, and the Resurrection; and the font is an excellent piece of work, entirely of serpentine of various colours. The floor throughout is mosaic. All the windows except three are filled with memorial glass, from the manufactory of Messrs. Heaton, Butler, and Bayne. The east window, in seven lights, and the rest of the chancel windows, relate to the life of Our Lord; those in the nave relate to St. John, in whose name the church is dedicated; and those in the apsidal vestry, which is placed at the west end, are filled with appropriate subjects. The organ is supplied by Messrs. Conacher and Co., of Huddersfield. The contractors have been—Mason, Mr. Crowther, Brighouse; joiners, Messrs. Marsh, Jones, and Cribb, Leeds; plasterers, Messrs. Rushworth and Firth, Halifax; plumber, Mr. Naylor, Halifax; and tiler, Mr. Rust, of Lambeth.

CHIPS.

The Viking ship recently discovered in the fiord of Christiania—or, at least, so much of it as remains entire—has been transplanted from the place where it was found to Christiania, and it is now inclosed in a shed specially set apart for its reception in the museum of that city.

Congresbury parish-church, Somersetshire, was reopened on the 23rd ult., after undergoing restoration. The unsightly old pews have been replaced by open benches of English oak. The reseating of the church will increase its accommodation from 420 to 470 persons. The work has been carried out from designs of Mr. E. B. Ferrey, Spring-gardens, London, by Messrs. Hutchings, of Honiton, the contract price being £600. The private chapel on the south side of the church, the property of the De Merle family, has also been restored in memory of the late Mr. W. H. De Merle by his widow—the work being carried out by Messrs. Berkeley and Co., of Wells-street, London, at a cost of £500. The interior walls and roof of the chapel have been decorated in colour, and the east window has been filled with stained glass, representing four French saints. In the south window is a representation of the Transfiguration. The screen dividing the chapel from the chancel has also undergone thorough restoration.

The foundation-stone of a new church of St. Joseph was laid on Wednesday week at Wetherby, by Dr. Cornthwaite, the Roman Catholic Bishop of Leeds. The building consists of nave 49ft. 6in. by 24ft., apsidal chancel 15ft. 8in. by 14ft., with narrow chancel aisles, and vestry 12ft. 3in. by 11ft. 6in., and porch towards the south-west corner of the nave. The cost is estimated at £730. The building is being erected by Mr. William Plows, of Ilkley, from the designs and under the superintendence of Mr. Edward Simpson, of Tyrrell-street, Bradford.

A new Primitive Methodist chapel was opened at The Obley, in the parish of Clunbury, Salop, last week. It has been built by Messrs. Jones and Son, of Bishop's Castle, from the designs of Mr. Thomas Evans, architect, of Brampton Brian.

The foundation-stones of a new Baptist chapel were laid in Commercial-road, Hereford, on Monday. Mr. J. Johnson, of London, and Mr. C. Haddon, of Hereford, are acting as joint architects, and the contractor is Mr. W. Bowers.

On Wednesday week the promoters of the Bill for the construction of a railway between Maidstone and Ashford held a banquet at Maidstone, in celebration of the passing of the measure through Parliament. The chair was occupied by Mr. George Hopkins, C.E., the engineer to the scheme, and amongst those present were Mr. J. S. Forbes, the chairman of the London, Chatham, and Dover Railway, by which company the line will be worked.

Considerable alarm has been occasioned at Fewston, near Otley, by the rapid subsidence of land. During the past fortnight cracks in the walls of houses have manifested themselves and increased daily, and tenants are fast quitting dwellings which are becoming uninhabitable. In the fields and gardens large openings have gaped a foot or two wide, and several feet in depth, and in some cases more than 100 yards in length, and boundary walls have fallen. The subsidence is attributed to the formation of the new lower reservoir constructed below Fewston, for the corporation of Leeds.

Mr. Wm. Fraser, S.S.C., assistant keeper of the Register of Sasines, and a well-known Scottish antiquarian, has been appointed Deputy-keeper of the Records in the Register House, Edinburgh.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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The charge for advertisements is 6d. per line of eigh words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

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To American Subscribers.—American subscribers are requested not to pay any more subscriptions to Mr. W. L. Macauley, of 23, Dey-street, New York City, that person being no longer authorised to receive them.

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Received.—E. H. E. of B.—R. M. T. of New York.—S. R. of H. W.—M. E. C. W.—S. B. and Co. of U.—H. G. of N.—W. H. of A.—W. P. B.—J. H.—B. and B.—A. C. and Co.—T. P. L.

T. G. S. (For particulars as to voluntary architectural examinations, address the Secretary, R.I.B.A., 9, Conduit-street, W.)

Drawings Received.—Rev. Mackenzie E. C. Walcott.

"BUILDING NEWS" DESIGNING CLUB.

C. F. M. C. (You are eligible to become a member of the Designing Club, which was instituted chiefly for students. Particulars of club will be published shortly.) —R. P. B. (The club will be resumed, and due notice will be published.)

Correspondence.

IRON IN PORTLAND CEMENT.

To the Editor of the Building News.

Sir,—I have read with much interest your article on "Iron in Portland Cement."

As far as I understand it, it refers principally to the presence of metallic, free or uncombined, iron in cement which is, after all, I beg leave to think, only a somewhat secondary matter.

But there are certain passages in the body and towards the end of your article which seem to touch upon a much larger question—a question which, to numerous producers and consumers, is almost a vital one. The importance of this question must be my plea for venturing a remark or two upon the language of your article. You say, "we hope to see in the not fardistant future the 'constructive' binding agent produced without the aid of *oxide of iron* or alumina. Both these ingredients are disturbing agents in the manufacture of a good and reliable Portland cement." And again: "We may say that the less iron in Portland cement the better; for its presence, whether chemically or mechanically, is productive of danger."

In these passages you appear utterly to condemn the presence of oxide of iron in cement, not merely in a free or uncombined state, but mainly, if not solely, in that state of chemical combination (more or less perfect) in which it is found in varying proportions in *all* Portland cements. Now this is obviously a very important question to a large class, if not to the public at large, and it is this to which I referred as "almost vital."

The reference to alumina I pass by for someone more qualified than myself to deal with.

The expression "almost vital," may seem to some too strong, but I justify it in this way: First—That there are no Portand cements which do not contain oxide of iron to an appreciable extent; and, further, that there are very many (probably the majority) good and useful Portland cements which do contain oxide of iron in considerable proportions.

If the analyses of the cements of Nos. 1 and 2 series (which should be as free from iron as any) had been given, they would probably have shown such percentages of iron oxides as would have amply borne out my statements. Even the German cement, which is so highly eulogised, has 2·76 per cent. of iron oxides in its composition, while the cement No. 1 of the 3rd series (of which the analysis is given) contains no less a proportion than 11·39 per cent. But it is superfluous for me to point out that numerous cements of good reputation and quality contain quantities of iron oxides ranging from 5 to 10 per cent.

If these things be so, and if, as appears from the above quotations, your condemnation is absolute, then I am justified in the use of the term "vital," for would not the results of the general endorsement and carrying out of your condemnation be to exclude from the practical world a vast amount of sound, useful material, and the abolition of many large industries which are at present a source of wealth to the nation?

In further confirmation of this view I proceed.

In another part of your article you use the words "it will, when receiving more consideration at the hands of makers and consumers of cements, lead up to the rejection of such raw materials containing an *immoderate* quantity of iron oxides." This bears out what I say: that to carry out your condemnation would be to reject vast quantities of the abundant stores of Nature which she has so prolifically scattered abroad. I do not know, of course, what your idea of a *moderate* quantity may be, but I think I may safely assume that it will not exceed 8·93 as given for the London clay, and most probably not 7·02, as in the German clay. These limits, as you know, would exclude many extensive deposits of valuable cement-making materials, especially in the north of England, where most of the clays and shales contain large proportions of iron.

And for *what* is this great revolution to take place? Chiefly, as far as I can see, for the sake of a theoretical perfection. Let us see whether the sacrifice is worth making. A cement containing oxide of iron may not be theoretically perfect, but it is none the less most valuable and useful as a constructive agent. For all practical purposes, for all the reasonable requirements of this work-a-day world, a cement containing oxide of iron is, I maintain, as good as any other. The only objections brought against iron in cement appears to be as follows:—

1st. Colour. That it has a tendency to make the cement brownish instead of grey. In nine cases out of ten in constructive works this is perfectly immaterial.

2nd. Slowness. That it has a tendency to make the cement slower in setting. This is only a very temporary drawback, and is often the indication of a superior cement.

3rd. That the presence of oxide of iron being unnecessary, it is to that extent deleterious.

That its presence is not necessary remains I think yet to be proved; but even if so, it will not affect the strength of the cement in any serious degree. But it would not be sufficient even to prove that oxide of iron is negatively detrimental; to bear out the strength of your remarks when you speak of it as a "disturbing agent" and as "productive of danger," it would be necessary for you to prove that it is *actively injurious*. And to this end I do not believe a tittle of evidence has been brought forward. This being so, I fail to see that any good purpose is to be served by a wholesale condemnation of such cements for the sake of an unrealisable dream of theoretic perfection.

A word or two upon another point.

In the paragraph last quoted and context you seem to imply that the amount of free iron extractable from a cement depends in some way on the proportions of iron oxides contained in the ingredients of which it is composed.

This, I think, is not borne out by facts.

In my opinion, the free iron is contributed mainly during the process of manufacture. And this may well be, seeing the very small relative amounts of iron eliminated by sieve and magnet and the evenness of the averages from cements made of diverse materials and from widely different localities. But whether this be so or not, the results in any case are perfectly insignificant and unworthy of prolonged attention. The average matter extracted from the 15 British Portlands is 0·306, or 1-327th part of the cement. But excluding No. 1, 3rd series, which is evidently an exception, seeing that the other two North Country cements show even results, and No. 2, of "Magnet" series, which also appears to be a faulty cement, we get an average for the 13 remaining British cements of 0·219, or 1-457th of the whole, from which the various samples do not widely vary, and which I cannot help thinking is a just and reliable average. But from the analysis given at the end of the article I find that only 9·51, or to speak roundly, 10 per cent. of the matter extracted by the magnet was iron in any form. We must then divide the fractions given above by 10 in order to arrive at the relative proportions of iron thus extracted from a given cement. Taking the average of the whole of the British cements, we find that the iron extracted by the magnet only amounts to 1-3270th part of the cement operated upon—a perfectly insignificant amount, and for all practical purposes of no consequence whatever. But when we take the juster average of the 13 cements, we get 1-4570th part, as the amount extracted by the magnet, and if the former result was insignificant, how much more so is this?

From the German cement, however, the iron extracted only equalled about one-third of this ridiculously small amount, or 1-13,710th part of the cement. This result, upon the supposition that the metallic iron in cement arises from defective processes of manufacture, certainly goes to show the high excellence of manufacture attained in the German manufactory. And this appears to me to be the only point of importance to be learnt from these inquiries—viz., that more care is required in the processes of manufacture to prevent the admixture of free iron with the cement; and upon a review of the whole question, I can but repeat the remark in the opening of my letter, that I considered the question of free iron in cement as only a somewhat secondary one. Of how much greater importance is the question of the presence of iron oxides and the rejection of impregnated materials, which is so strongly, yet so cursorily, dealt with by you.

There is, I find, one other thing that these experiments seem pretty well to establish, and that is, that the sieve may be trusted to extract nearly the whole of the metallic iron, thus providing a very easy way out of the difficulty.

With regard to the experiments upon natural cements (Nos. 6 and 7 series), it is certainly very remarkable that so large an amount of metallic iron should be found; but I do not think they form any guide whatever on the question of the presence of metallic iron in a highly artificial product like Portland cement. While on this point, I would just ask whether, in the third paragraph referring to No. 6 series, the sense would not have been more perfect with the word "even" left out? Also, whether I am right in supposing you to maintain that when oxide of iron is in large quantity in an ingredient, a portion of it will not be able to "combine in a profitable manner," and that that portion will, under the action of heat, tend to swell the metallic iron in the resulting cement?

Referring to the analysis of clay given (No. 3 series), I should be glad if you would point out the distinctive features in the character of the clay that may be supposed to render the resulting cement quicksetting? And also whether it is not more likely to be the result of light burning, as in your next paragraph you proceed to show that when more highly burnt, it is *not* quicksetting, and give its analysis?

You say that this clay is of a brownish colour, and the analysis shows that it contains 17·14 oxide of iron. Do you attribute the colour to the oxide of iron? And do you infer that the large percentage of free iron extracted by the magnet resulted from this?

The clay used in cement No. 2 of the same series you also say is a brownish clay, having a considerable portion of oxide of iron in its analysis; in fact, I should judge from your words, a very similar clay to the foregoing. But in this case the iron extracted by the magnet is below the average. Does not this fact tend to negative the idea that the free iron depends (in any degree) on the oxides in the clay?

In conclusion, I would beg that if you cannot find space for my letter, you would take an opportunity of explaining in your columns some of the points I have raised for the benefit of your readers and myself.—I am, &c.,

T. H. Duke.

Dove Hole, Stockport, Sept. 25.

WESTMINSTER VESTRY-HALL COMPETITION.

Sir,—In your comments upon the awards in this matter you take reasonable credit for having in your review of the drawings, pronounced that of "Stet" to be unquestionably one of the boldest ink designs in the room.

I dispute not its boldness, nor its ink, but its right to selection.

You also remarked as to my two designs ("Unitas," A and B) "that the author has fairly studied the requirements." I ask you then, in the name of all fairness, to allow me to point out that the work should be given to some one of the competitors who, like myself, did study, and not disregard, the requirements, and especially those as to cost.

The competitors were limited by the conditions to £15,000, inclusive of such a large hall as they could provide within that sum.

Now the authors of the other two premiated designs naïvely acknowledge, in their report, that they had not been able to include this hall at all within this limit, and it is obvious that the design of "Stet" failed as to this point even more egregiously.

Having refrained myself, as doubtless other competitors did, from all expensive features, in order to comply with this requirement, and having also fulfilled all other conditions, I feel that I am only acting justly to my brother-competitors and myself in asking a reconsideration of the judgment based upon the misleading report of Mr. Charles Barry.—I am, &c.,

John P. Seddon.

1, Queen Anne's-gate, Westminster, Sept. 29.

THE GLASGOW MUNICIPAL COMPETITION.

Sir,—I heartily agree with Mr. Clarke's protest as to the violation of the conditions in the "getting-up" of the above plans by the authors of the two first premiated designs.

I was simple enough to read the conditions literally, as he did; but to make doubly sure I wrote twice to the City surveyor to ask if the windows might be lightly washed in, pointing out the great improvement that would be thereby effected. I had replies distinctly and clearly saying that "no deviation from the instructions would be permitted"; and yet the Council have apparently allowed Mr. Barry to ignore what I consider in so close a contest to be a most important matter. If this is allowed to pass with an arbitrator, I am inclined to be content with the old style, and do as a worthy member of the Institute recently remarked to me—"Never to go in for a competition unless you have enough friends to win it for you."—I am, &c.,

A Competitor.

GREAT SPAN ROOFS.

Sir,—The "corrections" made by Mr. Butler do not touch the principle which I mentioned in writing the article. He almost finds fault with its brevity, but I did not intend in it to discuss a subject so thoroughly understood by all engineers, and upon which they are likely to differ as long as roofs are built. I thank him for one correction of a misprint in mentioning the Birmingham Station roof; it should have been *rolled*-iron arched ribs, and I may state here these are 15in. deep and 11-16ths of an inch thick, having angle irons at the top and bottom forming flanges.

As regards the other "correction," it is of little concern who invented the "ridge and furrow" roof. Let us award Sylvester the merit; at all events "Paxton" has the credit of it, and first applied it to a large building.—I am, &c.,

Writer of Article.

PROFESSIONAL REFEREES IN COMPETITIONS.

Sir,—Now that some architects are trying to prove that the appointment of an architect of eminence produces unsatisfactory results, taking as examples the recent competitions at Glasgow and in Westminster, I think it well to call your attention to a case in which the result has been perfectly satisfactory. Referring to the tenders published in the professional journals last week for the erection of a New Market Hall at Over Darwen, it will be seen that the accepted tenders amount to £13,417, or about £1,500 less than the estimate of Mr. Charles Bell, the architect. The competition designs were invited last year, and Mr. A. Waterhouse drew up the condition, as well as a report on the designs. The corporation accepted, without question, the award of Mr. Waterhouse. Mr. Bell was formally appointed architect, and the amount of *premium did not merge* into the commission.

Such a result is creditable to Mr. Waterhouse for his judgment in selecting the design, to the architect for his estimating, and to the corporation for fair, honest, and liberal conduct. I may add that all conditions as to style, size, and finish of drawings were rigidly adhered to by all the competitors.

May other public bodies be induced to imitate the example of the corporation of Over Darwen. I think that memorials to the R.I.B.A., by Mr. Cole Adams and his colleagues, can do but little, although I was

One Who Signed it.

P.S.—What a dreadful disappointment to the Richmond Vestry, after selecting a design marked "Natation," believed to be by a local resident, to find "two Richmonds in the field."

A BUILDER'S ACCOUNT, 1571.

Sir,—The following bill for pointing part of the tower of Newark Church in 1571 may interest some readers in 1880:—

NEWARKE SUPER TRENTE, IN COM. NOTT.

The whole charges for pontinge the steple to the battlements downe and begonne in Easter weke, and ended the weke before Crosse weke, in the yere of our Lord God a thousand, five hundreth, seventy and one, and in the thirtenth yere of the Reign of our Sovereign Ladye and Quene Elizabeth, and in the tyme of Mr. John Brignell, then Alderman.

	£.	s.	d.
Itm. One grette rope for the cradell pully.........	0	15	0
Itm. 6 strike of malte to make worte to blend with the lyme and temper the same ...	0	7	2
Itm. 7 quarter lyme	0	4	0
Itm. Three hundreth and a halfe eggs to temper the same lyme with	0	4	8
Itm. A lode of sand and smithe-come	0	1	6
Itm. A rope to draw up the cradell with	0	1	6
Itm. For a rope making	0	3	4
Itm. A rope to draw up his morter with	0	0	5
Itm. Paid to the mason for workmanshipe of the same steple	4	0	6
Itm. Given hym in rewarde besydes his wages...	0	11	8
Itm. For bruing the malte	0	1	2
Itm. Paid to his laborer for 27 daies	0	13	6
Itm. For southering the wethercoke	0	3	4
	£.	s.	d.
Summe totalis	7	7	9

Cross week was the Rogation days before the Feast of the Ascension. The Alderman of the Holy Trinity Guild was the chief personage until the town was incorporated under a mayor.—I am, &c.,

Mackenzie E. C. Walcott.

QUANTITIES.

Sir,—I only wrote concerning what I knew, and any ignorance displayed by others on that score makes but little difference to the facts of the case. I know prominent Liverpool builders (not "small fry") who regularly trust their foremen to see that the extras are duly claimed and duly measured, and I inclose, for the Editor's information (not for publication), the names of a few builders in this locality as a proof that I have not advanced anything I cannot sustain, and in one case I enclose a portion of a document in support of my statements. If I have libelled the builders as a body, I think Mr. Machell has cast a slur on the foremen of Liverpool, which is not in accordance with fact. I have not the slightest doubt that even he has received a list of extras from the men of whom he speaks so contemptuously; and I would just remind that gentleman that the foremen of to-day are the builders of to-morrow, and in the same way the draughtsmen of to-day blossom out into the full-blown architects and surveyors of to-morrow.

Turning now to Mr. Leaning, I would ask, Is it wise to use a terse and expressive proverb too rashly, seeing that it may, unfortunately, be run to earth and left there? Can he not perceive that if architects are not justified, even if competent, in being surveyors, that the same rule, when applied, undermines the whole fabric of the modern building contractor, and brings it to the ground. Pray do not hit too hard the architectural ability of the present day; temper your blows with mercy, and remember that, in many cases, clients persist in having certain things, both in design and construction, carried out which are anything but pleasing.

Mr. Hughes asks, Who is this Mr. Reid? But who I am or what I am can have little bearing on the points at issue. I have not *shirked* certain points. Mr. Hughes knows, or ought to know, that in Liverpool quantities are practically the basis of contract. If the quantities are short in any respect, a claim is made for the extra work done, and it has to be paid—at least, that is my experience—however small it may have been. How to deal with faulty quantities can be so easily answered that I never expected to be politely told I had *shirked* the question. Three words, "Decline to tender," sum up its whole merits. We are told by an eminent authority that it is easy to know when quantities are properly taken out, and the remedy suggested, if drastic, is simple and effectual.

When Mr. Hughes asserted that I "shirked" the question of the competency of quantity-surveyors, he made a statement difficult to prove, for I admitted, in my first letter, that some sort of an examination was necessary, and further suggested that builders, before being allowed to practise, should also give proofs of competency. I think he must have overlooked that paragraph, quite unintentionally. Let him be just, even if fearless, in his criticism.—I am, &c.,

Edward Reid.

16, Portia-street, Baukhall, Liverpool, Sept. 28.

THE ARCHÆOLOGICAL SOCIETY OF ROME.

Sir,—As a member of the committee of the Archæological Society of Rome, and as one who has taken an active part in its proceedings for three or four years, and has, consequently, an interest in its welfare, I beg to state, on the authority of the treasurer of the Society, Mr. Hooker, of Rome, that the paragraph in your paper, copied from the *Times* of 13th, intimating that the Society was extinct, is erroneous.

Mr. Hooker is the only officer of the Society resident in Rome all the year round, and had there been any intention of closing the Society, he naturally would have been the first person to hear of it.

We have certainly sustained a great loss in the enforced absence of Mr. Parker (on account of the state of his health) for the last three years; but the Society is still carrying on the work which he commenced with much success, and carried on for a period of about fifteen years with much energy.

I hope, therefore, you will do me the favour of giving publicity to this contradiction of a report which is calculated to injure materially the interests of a Society which, I hope, will flourish for many years, notwithstanding the attacks of inimical, anonymous writers in the papers.—I am, &c.,

Richard Popplewell Pullan.

Villa Webb, Bagia di Lucca, Sept. 22.

◆

About £170 having been accumulated by the Edinburgh Town Council, as a surplus on fees for admission to the Scott Monument, it has been decided to devote the fund to the placing of additional statuary in the remaining vacant niches of the memorial. Designs will be invited from Scotch sculptors for the filling-up of from 20 to 30 of the empty niches, leaving the others to be dealt with at a future time.

Owing to the want of safe landing-places in the island of Cyprus, the British Government is about to erect a large screw pile pier on the island of Limasol. The contract has been taken by Messrs. Cochrane and Co., of Woodside Ironworks, Dudley, who built the bridges over the Thames at Westminster, Charing-cross, and Cannon-street. The work is to be executed with all possible despatch.

Intercommunication.

QUESTIONS.

[6245.]—**Boundaries.**—Could any one recommend a book on surveying, or a cheap one on Land, which treats fully on boundaries?—Land.

[6246.]—**Pumps.**—Can a pump be got that is workable by one man to draw water from a well 100ft. deep; and, if not, what is the greatest depth such a pump will draw? If there is such a pump, will any reader kindly give particulars of it, and where obtained?—Hector.

[6247.]—**Removal of Paint.**—I shall be very glad to hear of the best method of removing paint from the stonework of an ancient building. Anything in the way of chemicals must not be such as will injure sandstone or oolite.—H. B.

[6248.]—**Yorkshire Abbeys.**—I intend taking a tour in Yorkshire, starting north with Bolton Abbey. Will some one kindly give me information as to best route, &c.? Would a map, such as those issued by the Geological Survey, be of service, or are there any guide-books published of these interesting places?—North.

[6249.]—**Damp Proof Course.**—Can any reader inform me which is the best method of using pitch for damp proof course, and what the cost will be per square foot?—Plumb Rule.

[6250.]—**Perspective.**—Can any of the correspondents of the Building News kindly inform me the best and simplest book on perspective?—A Beginner.

[6251.]—**Sewage in Country District.**—I have to arrange for the disposal of the sewage of a small mansion in a country district, which is at present carried into a settling tank, from which it overflows into a running ditch, and I should be glad if some correspondent, with practical experience of their working, would say whether he considers a small filter tank or a small irrigation area the best way of dealing with the sewage. If the former, what would be about the best size for such a small quantity, and how often the filter should be cleaned, and if the latter, how much land would be necessary? I do not know of any inexpensive book giving details applicable to such a case, but perhaps some correspondent may.—Beta.

REPLIES.

[6221.]—**Ventilation.**—"N. A. L.," at p. 314, says he wishes to carry out ventilation by using vertical tubes, placed in the angles of the rooms or where most desirable. Now, "vertical tubes" for ventilation are what Mr. Tobin seems to claim by his patent of 24th March, 1873, No. 1081, price 10d. Many people consider that Mr. Tobin has no proper foundation for this claim, as vertical tubes were used for ventilation long before A.D. 1873. Mr. Tobin, however, deserves credit for calling public attention so much to their value. In a patent prior to Mr. Tobin's (and now public property), viz., Mr. Thomas Boyle's, of London, No. 1636, 1st July, A.D. 1863, price 8d., we read that ventilating tubes may be put in through the outer walls of a house, or through doors, partitions, or analogous places, and "the air once admitted into the building by this means may be deflected in various directions or conducted by extension tubes or air-passages," and it further says, these tubes may be used either with or without "finely-perforated air medium." All which sounds a good deal similar to what Mr. Tobin, 10 years' after, put into his 1873 patent, for the "smaller tubes" or "branches" in Mr Tobin's patent are simply extension tubes, as per Thomas Boyle's patent, and seeing that the latter claims liberty to "deflect (the incoming fresh air) in any direction," I do not see what business Mr. Tobin has to step in ten years after and say, "Well, you are free to 'deflect' in any direction except the 'vertical,' as *I* am now intending to claim it for the next fourteen years." I understand the £100 duty was paid this year, so Mr. Tobin's patent is intended to run the full time. As to its value, under the circumstances, to prevent people using vertical tubes for ventilation, that is a different matter. To parties who do not wish to interfere with Mr. Tobin's "vertical" tube, I would suggest that they should use a slightly inclined tube pointing out from the wall a little at the top so as to send the fresh air more away from the walls, and more towards the centre of the room. This would tend to keep the walls cleaner, and would be an improvement upon Mr. Tobin's vertical idea, and he would not, in face of Thomas Boyle's patent, and upon the merits of his own, have any right, I consider, except to "grin and bear it." The outside of the tube or case might be vertical although the inside were inclined. Another plan presents itself to my mind or memory, suggested by a remark in a paper by Mr. W. F. Butler, "On the ventilation of Buildings," to be found at page 137 of the Building News for January 31st, 1873, which is prior to Tobin, and also long before Edison's patent of 12th June, 1877, No. 933, price 6d.; said remark or recommendation being that fresh-air inlets be made near the floor in sides of the room, said air inlets being "made larger towards the room." The idea suggested to my mind by this is that slots might be made in the top of the skirting round the bottom of the room, or a special belting might be made, through which the fresh air might be admitted, said slots being, say, 4in. long, ¼in. wide at bottom, and ¾in. at top, which would tend to prevent draught being so readily felt. Instead of delivering the air vertically, or nearly so, they might be put in the side of the belting so as to deliver the air horizontally or nearly so. Another idea that might often be acted upon with advantage is to have fresh air fountains (one or more) in the centre of the dining-tables. A pipe being led to the floor under the table could be so made and put in as to be ready for use at a moment's notice when wanted, by its having a trap screw cover or lid, which being taken off a movable pipe in connection with a fixed pipe under the table, could allow fresh air to blow up at one or more places in the table, and so often be a great boon and a comfort to the people seated round the table at dinner, &c. So much for "inlets," but I would like to hear "N. A. L.'s" idea of the outlets. A member of the General Medical Council lately remarked in my hearing, "Provide sufficient outlets, and the inlets will take of themselves," thereby signifying that the outlets are often of more importance, or are more generally neglected, than the inlets. After giving "N. A. L." a chance to reply, I may say something regarding efficient outlets.—B.

[6226.]—**Architect's Commission.**—"An architect can claim a commission of 5 per cent. on the outlay if no agreement has been made to the contrary." Of course he can, but is he legally entitled to it? Can "G. H. G." quote legal decisions corroborating his assertion?—A. E. J.

[6232.]—**Sloping Church Floors.**—St. Brannock's Church, Braunton, near Barnstaple, North Devon, has a sloping floor, higher by the screen than the centre of the nave. The book rests and uprights to support them are 4½in., and most of the woodwork is equally ponderous. The carved bench-ends are known as examples of oak excavations.—I. W.

[6232.]—**Sloping Church Floors.**—In reply to "J. D. P.," I will say that the floor of the large parish church of St. Nicholas, East Dereham, slopes very considerably towards the west, and the seating corresponds with the slope of the floor.—Ed. Gaskin.

[6232.]—**Sloping Church Floors.**—The steepest gradient from west to east is in Ashburnham Church, Sussex, with flights of stairs, and the effect is very fine, leading the eye instinctively to the altar, which stands prominent on its lofty platform.—Mackenzie E. C. Walcott.

[6232.]—**Sloping Church Floor.**—The floor of nave and aisles of Bruton Church, Somerset (late 15th century work), inclines about 15in. from W. to E. The sill of each window in the aisles is a few inches higher in level than its neighbour westward, thus showing the slope to be original and intentional. I believe it follows the natural inclination of the ground from W. to E., but not from N. to S., the floor being level, and the ground sloping from S. to N. rapidly. The slope may have been taken advantage of to save steps at the chancel arch (there are several still), and to give a more imposing effect to processions. But is "J. D. P." right in stating that the slope is so much as 6ft.? This would make the floor a very steep incline.—R. J. W.

[6238.]—**Weight of Iron Rafters.**—The methods adopted for ascertaining the weight of iron rafters vary according to circumstances. Perhaps the most satisfactory mode is to obtain the weight of one foot in length of the rafter for a given section, and then multiply by the number of feet in each rafter for the whole weight. To obtain the weight by calculation, it is necessary to add the web and flanges together, if they are of the same thickness, and consider them as a plate of metal. Then, by multiplying the sum by the length of rafter, a superficial quantity is obtained, which can be priced at so much per foot. Or the solidity of the rafter can be calculated by taking the sectional area in inches and multiplying by the length, which will give the solidity; after which, the weight can be readily ascertained by consulting a table of the weight of iron. In handbooks, it is usual to give the weight per foot of plates of certain thicknesses, the weight of bars of different sections, by which mean calculation is saved. The weight of iron 1in. thick is 40lb. Tables of the weights of rolled iron are given in "Engineer and Architect's Pocket-book" (Lockwood and Co.). The weight of a cubic foot of wrought iron is 480lb.—G. H. G.

[6240.]—**Books on Building Construction.**—In answer to "Marsey," I think he will find "Notes on Building Construction" (published by Rivingtons, and to be had of Batsford, 52, High Holborn) answer his purpose well, as they are compiled in order to assist students preparing for examinations in building construction (Science and Art Department). The 1st and 2nd parts 8s. 9d. each; 3rd part, 17s. 6d.—T. J. B.

[6240.]—**Books on Building Construction.**—The text-books generally used in the science schools are Rivington's "Notes on Building Construction." They are in 3 volumes, the first being applied to the elementary stage, the second to the advanced stage, and the third to the honours stage. They may be obtained through any bookseller.—F. E. H.

[6242.]—**Good Freestone near Liverpool.**—I would recommend you to see the stone procured from the new quarry at Rough Park, Upholland. The colour of the stone is an excellent yellow, and for durability and quality cannot be surpassed in England. It is a splendid stone.—O. P. Q.

[6242.]—**Good Freestone near Liverpool.**—Some good sandstones are to be obtained in Lancashire and Cheshire. Bedstone is a warm-tinted stone, much used in Shrewsbury. The Runcorn sandstone is a good stone of dark red, so is the Stanley stone. For a complete list of building stones, I may refer J. Comrie to "Notes on Building Materials," Vol. III., where the qualities will be found described.—G. H. G.

[6244.]—**Materials for Concrete.**—Lime rubbish, if mixed with a proper proportion of clean ballast, might be used. As regards sea-sand, I should certainly hesitate to employ it unless thoroughly washed.—G. H. G.

[6244.]—**Materials for Concrete.**—Lime rubbish and plaster from old walls or ceilings are quite unsuitable for mixing with Portland cement to make concrete, and so also is fine sea-sand. Writers on concrete who understand the subject know too well the dangers attending the use of such materials, and, except in words of warning, make little, if any, allusion to them.—H. R.

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"A Disappointed F.S.A." writes complaining that the Fitzalan Chapel at Arundel, which was recently announced to be thrown open to visitors on Mondays and Fridays, was a week later again closed to the public. He adds: "It certainly seems marvellous that access should thus be positively prohibited to this most interesting building, containing some of the finest monuments in England, as it can be visited without the slightest intrusion on the privacy of the noble owner of the castle, and the expense of maintaining a special attendant could easily be defrayed by a small fee, to be exacted from each visitor."

STAINED GLASS.

Christ Church, Southport.—The large five-light east window in this church has been filled with stained glass of a very beautiful character. The window contains five life-size figures—in the centre light, St. John Baptist, on the left St. Peter and St. Andrew, and on the right St. Philip and Nathaniel. These figures, with their richly diapered robes and backgrounds of deep foliage, form a band of grand and harmonious colour across the window, which is otherwise light in treatment. The ornamental portions of the window are leaded in quarries, and the lights are treated alternately with apple and vine foliage, pierced with medallions of full colour bearing the monograms Alpha and Omega, and "I. H. S."; the medallion in the centre light is larger, and contains the "Agnus Dei," which forms the key of the design—this comes below the figure of St. John, with the appropriate text, "Behold the Lamb of God." The interest of the window is sustained in the tracery by angels bearing scrolls. The window has been designed and executed by Messrs. Shrigley and Hunt, John O'Gaunt's Gate, Lancaster, and 28, John-street, Bedford-row, London, W.C.

Wellingborough.—On Thursday a memorial window in the south chancel aisle of St. Luke's parish-church was completed. The window is erected in memory of the late Mr. and Mrs. W. Gill, and consists of five lights. The subject is our Saviour, as the Good Shepherd, holding a lamb in His arms, as the central figure, and the side-lights are occupied with figures of the four Evangelists. These are of life size. There are numerous smaller figures and emblems as adjuncts. Along the bottom, in Old English text, is an inscription. The work was done by Mr. Drake, of the Cathedral-yard, Exeter.

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WATER SUPPLY AND SANITARY MATTERS.

Liberton, N.B.—Works of sewage-disposal and irrigation have just been carried out in the village of Liberton, from plans and under the supervision of Messrs. Stewart and Menzies, civil engineers, of Edinburgh. Surface-waters are excluded from the sewers, which are furnished with flushing-apparatus and ventilators, and have their outlet in a large concrete tank, near Liberton South Mains farm buildings. On this farm the solid matters will be separated from the liquid, and the sewage from the tank will be distributed over the surface of the ground by means of iron pipes, with the requisite valves and hydrants, and will be utilised for growing vegetables.

New York Water Supply.—The present consumption of water in New York is at the rate of 100 million gallons per day; but as it is felt that, should any accident happen to the Croton Aqueduct, very serious consequences would ensue, it is proposed to build a new conduit one-half larger, which will be capable of delivering 150,000,000 gallons per day, whereby the present service and the projected one from the Bronx and Byram rivers would be increased to a daily supply of 250,000,000 gallons. The cost of the new conduit is estimated at 10,000,000 dols., which does not include additional storage reservoirs. Another scheme is to tap the water of the Housatonic river, which rises in the Berkshire Hills of Massachusetts, and by this means a stream could be diverted into the Croton at the rate of 100,000,000 gallons per day, at a more moderate cost than the former scheme. From whichever source the new supply is to be obtained, a new aqueduct will have to be built.

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CHIPS.

The foundation-stone of a new parish-church has been laid at Bangor, near Belfast. It will be Gothic in character and cruciform, the principal dimensions being 90ft. by 72ft. The materials are local stone and red sandstone dressings, and the walls inside will be finished with sandstone dressings and tinted plaster. The seats will be open, and of pitch-pine. Mr. W. H. Lynn, of Belfast, is the architect, Messrs Harvey and M'Loughlin are the contractors, and the estimated cost of the building is £10,000.

At a vestry meeting held at Market Drayton on Friday it was decided to appoint a committee for the restoration of the parish-church, with instructions to select an architect who should draw up plans, to procure a faculty, and to advertise for and accept tenders for the works. It was announced that the subscriptions amounted to the sum of £3,572 13s. besides some conditional promises.

The foundation-stone of a new Primitive Methodist Chapel was laid at Hasland, near Sheffield, on Monday. It will seat 500 people, and is not expected to cost more than £800. Mr. James Kerridge, of Wisbech, is the architect, and Mr. J. Fiddler, of Eckington, the contractor.

Our Office Table.

At a vestry meeting of St. Giles's, Cripplegate, E.C., held on Wednesday week, a report was read from the Church Improvement Committee, recommending that the font should be raised, and that the western portion of the church, now being laid with ordinary stone, should be relaid with tesselated paving, as in other parts of the building. A sharp discussion took place as to the paving; the chairman (the vicar) and others objecting to the manner in which this had been carried out, and complaining that the passages in the eastern part had been laid in tesselated work, and the vacant space at the western part in diamond pattern Mr. Woodthorpe, the architect for the restoration, defended what had been done, and objected to this part of the committee's report. He objected to see a large space like that at the west end of the church covered in one uniform pattern, like a gigantic carpet, and, in his opinion, they could have too much tesselated pavement. He would like the vestry to see the present effect before they passed a resolution. The members then visited the church, and on their return there appeared to be a large preponderance of opinion in favour of the paving as arranged by the architect. The recommendation relating to the font was adopted, Mr. Larke's tender being accepted for the work, the second recommendation being dropped, in spite of the vicar's expressions of regret and declaration that he "had never seen a more hideous thing" than this paving.

At a meeting of the town council of Southampton, held last week, a member asked whether, considering the article that recently appeared in the *Athenæum*, and the letter of the Society for the Protection of Antient Buildings, both protesting against the restoration of the paintings on the Bargate, the committee would reconsider the matter before having the pictures of giants and the shields painted. The mayor replied that the question had already been decided upon. As to the shields, there would be no vandalism, for they were being judiciously touched up, and would soon tone down and look all right. The giants were a different matter altogether—they had been taken away. He considered the appearance of the Bargate had been greatly improved by their removal, and they would not be replaced without a special vote of the council. An alderman complained that whereas the original resolution had referred equally to the renovation of the shields and giants, yet the mayor had implied that the one class of paintings would be restored and replaced, and that the other class would not; but the subject dropped without any further expression of opinion.

We mentioned last week (p. 373) the complaint made by "Redux" of the accumulation of dry sticks and rubbish in the staircase turrets of the central tower of Canterbury Cathedral, and his suggestion that the tower should be kept tidy and thrown open to visitors. The Dean of Canterbury, Dr. Payne Smith, has replied, admitting that, throughout the spring, a close time is maintained for the jackdaws who build in the cathedral towers, when they collect such a quantity of rubbish that, at the end of the breeding season, a cartload, or more, is often removed from the central tower. The birds build platforms in the turrets, rising the height of two stairs to obtain sufficient width. The nests are removed every autumn; but this year the cleansing was unusually delayed. The central tower, the Dean adds, may be ascended on payment of a fee which, though it may seem large, is no equivalent for the disarrangement of work by taking a workman off from his duties. Dr. Payne Smith does not explain whether, on payment of this apparently large fee, the tower turrets are opened before the birds' nests are removed from them. If they are, and at least "Redux" obtained admission during the close season, the charges of insecurity to the visitor from the slippery footing, and to the cathedral from a carelessly-dropped match, would appear to be established.

A new "Visitors' Handbook to Gloucester Cathedral," just written by Mr. J. H. Billett (Gloucester: E. I. Billing, 1880), is a shilling guide. The work seems to have been carefully done, and the minster is described with a minuteness of detail and a fulness which will prove very acceptable to the visitor. The restorations effected a quarter of a century since by Mr. F. S. Waller, of Gloucester, then the cathedral architect, and those carried out in the choir since 1867, the date of the appointment as architect of the late Sir Gilbert Scott, are summarised. Speaking of the results of these works, the author admits, with regret, that an appearance of "newness" forces itself on the attention of the visitor to Gloucester Cathedral, a defect nowhere more apparent than in the somewhat gaudy marble and tile floor of the choir. While much of the information is corrected up to the present date, we notice that the published dimensions of the cathedral follow the figures given in Murray and elsewhere, whereas, a few months since, the Royal Engineers engaged in the Ordnance Survey issued the results of remeasurements, which slightly differ from these. Thus the height of central tower is still stated as 229ft., whereas, from surface of ground to summit of pinnacles, the corps of engineers found it to be 225ft. 10in. A ground-plan of the cathedral, which forms a frontispiece, adds considerably to the value and utility of the handbook.

Mr. Nichols, of Leeds, has just completed a piece of his "Eureka concrete" in the Oxford-street end of Cavendish-street, for the Marylebone vestry board. It is put down as a footpath, and is of a very superior kind, being made of specially-prepared materials used in this concrete, and White's best Portland cement. It is the first time that concrete of this description has been laid in London, although large quantities have been used in the North. Mr. Nichols claims for this concrete greater durability, at less cost, than asphalt or York paving. It would be an excellent material for stables, warehouse basement and other floors, where there is much traffic, or fireproofing buildings, and for fireproof construction. For use in stables or yards, it is arranged so as to give a firm foothold to the horses. It can be laid where heavy traffic is constantly passing with perfect safety, and with good results, so far as wear-and-tear is concerned.

Mr. John H. Webber, of 70, Finsbury-pavement, has published a sheet of drawings representing the tombs of the principal historical characters buried in Bunhill-fields burial-ground. Many will be glad to possess a *souvenir* of the last resting-place of such well-known men and women as Richard Cromwell, John Bunyan, Isaac Watts, Mrs. Wesley, and others, whose gravestones are depicted on the sheet. It is a pity they are almost without exception so ugly that no one can contemplate them with any other wish than that they may decay as speedily as possible, and leave the fame of those who sleep below them to the custody of the nobler memorials wrought by their own works.

A lively discussion on water-closet ventilation and the independent responsibilities of corporate officials was caused at the Tuesday's meeting of the Edinburgh Town Council, by the receipt of a report from the public health committee. This report recommended, on the advice of the burgh engineer, that that official be instructed to call upon the owners of certain common-stair property to have their water-closets ventilated to the open air. Upon this, Mr. McLachlan asked on what system the Council were proceeding, seeing that the Dean of Guild Court sanctioned plans of houses with water-closets in them, constructed upon the very principle now condemned by the burgh engineer. The Dean of Guild exclaimed that this was not true, whereupon Mr. McLachlan added that only last week he saw approved plans which did not provide for the ventilation of the water-closes into the open air. The Dean of Guild again contradicted the statement, saying he had insisted that each w.c. should be ventilated by a 4in. pipe; but another member, Mr. Gowans, confirmed the statement, and observed that no closets should be put into the centre of houses. An architect must be very ignorant of the principles of his profession, and be a very poor planner, if he could not place the closets outside. The pipe mentioned by the Dean was not a proper method of ventilation, for if a candle were put to the mouth of one of those pipes the draught would often be downwards, and not upwards. That was only what might be anticipated if the interior of the house was hotter than the outer atmosphere. The Dean of Guild pleaded that if the burgh engineer put his initials upon plans, the Dean of Guild Court could not help itself, but several members urged that he had ample discretion in the matter. Ultimately, the committee's recommendation was passed. The discussion will probably awaken the attention of architects and builders, for a few weeks at least, to the sanitary necessity for planning closets next the external walls of dwellings.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen, it acts as a derivative, and thus displays the utmost salutary influence over stomachic disorders, derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.

CHIPS.

It is intended to erect a public laundry at Bedford Park, for the use of those resident on the estate and their friends. Mr. Norman Shaw is the architect.

The Temple Library is about to be built, from the designs of Mr. R. W. Edis, F.S.A., who, we believe, has succeeded to the post of architect to the Middle Temple, left vacant by the late Mr. E. M. Barry, R.A. The style chosen is Late Gothic, in red brick and stone dressings, freely and very picturesquely treated. The main front will face King's Walk, and will join the tower built some years since by Mr. Arthur Cates.

The chairman and several members of the City Lands Committee of the City Corporation have inspected Coulsdon Common, Surrey, with reference to a proposal that the Corporation should acquire it as an "open space."

The Leeds Town Council decided, on Thursday week, to erect at a cost of £6,500, baths and wash-houses on land belonging to the Corporation in Lemon-street, from plans and estimate prepared by the borough engineer.

The Great Grimsby Provincial Tramway Company are now laying about four miles of line. Messrs. Davis and Emanuel, of London, are the engineers for the works, which are being executed under the superintendence of Messrs. Maughan and Cuxson, of London and Grimsby (as resident engineers), by Messrs. Reggall and Havins, contractors, of Grimsby. It is expected that the lines will be opened early in January next.

We notice that, in addition to the medals awarded at the Sydney Exhibition, Messrs. F. W. Reynolds and Co., of Acorn Works, Blackfriars, have received a special prize at the Brisbane Exhibition.

At a vestry meeting held at Church Stretton, on Thursday week, it was decided to reconstruct the upper part of the tower, including the erection of a conical roof, and the lowering of the pinnacles, as recommended in a report by Mr. S. Pountney Smith, architect. The contract for the work has been taken by Mr. Richard Price, of Shrewsbury.

The Corporation of Ipswich resolved, at their meeting last week, to entrust the examination and re-arrangement of the municipal charters, records, and manuscripts to Mr. J. Cordy Jeaffreson, who has been making an examination and report upon the muniments for H.M. Historical MSS. Commissioners.

Mr. Caspar Pardon Clarke has been deputed by the Science and Art Department to make purchases of Indian art objects to complete the collection exhibited at the India Museum, South Kensington. A fund of about £8,000 has been placed at Mr. Clarke's disposal, and amongst the special objects of his tour are the metalwork of Madras and Cashmere, the wood carving of Ahmedabad and Canara, the pottery of Madura and Mooltan, and the textile fabrics of Masulipatam, Jeypore, Dacca, Lucknow, Delhi, Ahmedabad, Sindh, Bangalore, Malabar, and Central India. Mr. Clarke will sail for India on Thursday next.

A new church, dedicated to St. John, which has been erected in Waenfawr, a chapelry of Carnarvon, and the centre of a large mining population, was opened on Tuesday. The cost of the building is about £1,200, and the works have been carried out by Mr. Elias Davies from the designs of Mr. Kennedy, architect, Bangor.

In accordance with the resolution passed at the Dublin Trades Union Congress—viz., that the secretary, (Mr. Broadhurst, M.P.) should have an advance of salary—the Parliamentary Committee have decided to increase the salary from £130, to £200, per annum.

The sculpture department of the British Museum has lately been enriched by the gift of a fine white marble bust of the celebrated General John Churchill, first Duke of Marlborough. The bust is a fine specimen by Regsbrach, and now occupies a conspicuous situation in the entrance-hall of the museum.

The foundation-stone of the new Roman Catholic church of SS. Peter and Paul at New Brighton was solemnly blessed on Wednesday. The plan of the church shows nave, porch, gallery, chancels, side-chapels, and sacristies. It will be of simple Gothic character, carried out in the Early English style of architecture, in brickwork, principally with stone dressings. Mr. Edmund Kirby, Liverpool, is the architect.

A correspondent of the *Times* replies to the strictures of Mr. Rawlinson, C.B., at Exeter last week, on the condition of Government buildings in London. While the writer admits that "it is perfectly true, as a matter of history, that Somerset House and the War Office have been 'terrible examples of bad drainage,'" he reminds Mr. Rawlinson that he ought not to have omitted to add that "the Government are gradually rectitifying the defects in all their offices; that the War Office notably was three years ago thoroughly remodelled as regards sanitation, under the advice of a committee over which Sir William Jenner presided; and that similar works are now in progress at Somerset-house."

A committee proposed, as a memorial to the late Alderman Guest, F.S.A., of Rotherham, a well-known antiquary, who did much to benefit the town in which he lived, to restore the old chapel on the bridge in that town, and to convert it into a museum. The feoffees have, however, declined to permit the proposed restoration, and the committee, who experienced some tardiness in the receipt of subscriptions, have resigned in disgust.

Large street excavations have just been made in the Mile-end-road and other East-end thoroughfares on account of the discovery that a very considerable quantity of gas was escaping at some points of the gas mains into the street sewers. The opening up of streets has caused considerable disturbance to business and street traffic, and the inhabitants are moving with the object of inducing the Legislature to make the general adoption of the subway system for water and gas mains compulsory.

Mr. J. Charles Cox, J.P., of Belper, the well-known archæologist and author of "Churches of Derbyshire" has been ordained as a deacon at Lichfield Cathedral.

Some years have passed since the late Count of Syracuse, brother of Ferdinand II., occupied himself in exploring the Necropolis of Cumæ. The work has lately been recommenced with considerable success. Several tombs have been discovered with or without pavements of tufa, some in complete ruin. In the great proportion of these skeletons were found more or less intact, with mirrors (*specchi*), dice, bronze money, glass bottles, rustic pots, plates, cups, perfume vases, and other articles of a similar character.

The Lancashire and Yorkshire Railway Company are about to erect a large new warehouse in connection with their goods department at Oldham-road, Manchester. The new building, plans for which have been prepared by Mr. C. W. Green, the company's architect, will contain five floors for the storage of goods, besides extensive cellars, and on the ground-floor will be a series of stages for the delivery and loading of goods. The warehouse will measure 145ft. by 140ft., and its extreme height will be 80ft. Six lines of way will run into the building from the goods yard, and around the stages there will be a broad cartroad. The contract for the work has been let to Robert Neill and Sons, Strangeways. A cattle-loading mound, a timber gantry, and other works, are also being provided to meet the increased demands made upon the company in Manchester.

The great work of reconstructing the famous railway suspension-bridge across the Niagara river has just been completed without interruption of traffic. The task was undertaken some months ago by Engineer E. A. Buck, and, though many prominent engineers doubted the feasibility of the plan, he has carried it out, making an iron and steel bridge out of a wooden bridge, by a process of substitution which has not occasioned the slightest interruption of trains. The casual observer would never have suspected that anything more than a little repairing was going on.

New baths and washhouses are about to be built at Jacob's Wells, Bristol, for the Clifton and St. Augustine districts, from the designs of Mr. Joseph Thomas, city surveyor of Bristol.

The appointment of Mineralogical Surveyor to the Government of Natal has been conferred upon Mr. F. W. North, who has been instructed to submit a scheme for the development of the coal fields of the colony.

CHIPS.

Roylo's Head, a service reservoir intended to supply the district of Halifax west of Queen's-road, is completed. It holds about six million gallons, and has cost some £7,000. Mr. Paskin has been the engineer, and Mr. J. Brook, the contractor. The reservoir was brought into use on Tuesday week.

Five men were killed by noxious gases, whlie clearing the junction of sewers, under the Boulevard Rochechoumart, Paris, on Sunday morning. The sudden influx of bad air into the sewers is supposed to have been caused by workmen who had been emptying a cesspool in the neighbourhood, and who, contrary to the regulations, poured the contents of their vans into the sewer.

The Manchester meeting of Friends has authorised the Hall Committee to expend a sum of £12,000 in the erection of a permanent and specially-designed hall of residence for Quaker students of Owens College. A plot of land has been secured in an open situation in Victoria Park, and plans have been prepared by Mr. G. T. Redmayne, the architect of the new School of Art. The contract has been let to Messrs. Southern and Sons. The new building is to contain a residence for the Principal, and rooms for 30 students. The culinary department, the dining-hall, the library, classrooms, bathrooms, offices, &c., are upon a scale larger than would be needed for present requirements.

A Catholic Apostolic Church, erected at the corner of Edmund-street and Lansdowne-place, Bradford, was opened on the 22nd ult. The style is Early English. The church consists of a wide nave with chancel of less width, provision being made for the future erection of a transept. At the west end is a small baptistry. Internally the church is plastered, the roof being open and constructed of pitch-pine. The altar is of marble (executed by Mr. Joseph Clark and Son). The contractors for the works have been—Masons, Messrs. Kitchin Brothers; carpenters and joiners, Wm. Ives and Co.; slaters, Hill and Nelson; plasterer, Benjamin Dixon; plumbers and glaziers, D. Higginbotham and Sons. The architect is Mr. W. James, of London; Mr. John Coates being the foreman of the works.

The Government of the Sultan, on Tuesday week, definitely approved a concession for a line of railway connecting the towns of Tripoli, Homs, Hamath, Damascus, Aleppo, and Bagdad to an English firm.

The parish-church of SS. Peter and Paul, Newport Pagnell, was reopened last week, after restoration, including the substitution of open seats for pews, and the addition of gas-jets round each pillar of the nave. Mr. John Odell carried out the latter works and Mr. E. D. Michell the reseating.

A sanitary association was inaugurated at Westgate-on-Sea on Saturday, when Professor Erasmus Wilson, F.R.S., was appointed as chairman, and Mr. W. Q. Orchardson, R.A., as vice-chairman; the nuisance caused by decomposing seaweed was discussed, and a letter was ordered to be sent to Mr. E. F. Davis, requesting his attention to the subject.

The foundation-stone of a new Primitive Methodist chapel and school was laid on Saturday, at Low Fell, near Newcastle-on-Tyne. The edifice will be built of stone, will measure 48ft. by 34ft.; the schoolroom will be beneath the chapel, and each will seat about 250 persons. Mr. Edward Jameson, of Gateshead, is the architect; Mr. T. H. Hutchinson, Gateshead, the contractor for masonry; and Mr. John Rippon, Gateshead, contractor for the other trades.

Memorial-stones of new Wesleyan Sunday and day schools were laid at Bilston on Wednesday week. The school is to be a brick structure, 57ft. by 26ft. outside, and 33ft. in height, the total cost of erection being about £700. Messrs. Hickman and Johnson are the builders.

Mr. Isaac Sutton, of Dalston, who for more than half a century had been surveyor to the Phœnix Fire Assurance Office, was fatally injured by a street accident when leaving the Great Eastern Railway City terminus on Friday. Mr. Sutton was in the 77th year of his age.

The restoration of the parish-church of Llanrhaiadr-yn-Mochnant is proceeding, after having been at a standstill for some months. The contractors are Messrs. Edwards and Davies, of Oswestry.

Opening services in connection with a Welsh Wesleyan Methodist chapel, which has been erected at Abergele, were held on Sunday. The style of architecture is the Renaissance, partaking somewhat of the Roman-Doric in detail. The materials used are lime and Ruabon stone. The external dimensions are 53ft. by 46ft. In the rear is a lecture or schoolroom 41ft. by 30ft., two commodious class-rooms, and the necessary offices. Accommodation is provided for 600, and the pews and other fittings are of pitch-pine. The ceiling is divided into compartments by moulded ribs and an embossed centre. Mr. Richard Davies, Bangor, is the architect, and the contract, let at £2,500, has been carried out by Mr. James Copping, Abergele.

Memorial-stones of a new Wesleyan Chapel at Polruan, Cornwall, were laid last week. It will be Early English Gothic in style, constructed of Plymouth limestone, faced with Bath stone, and roofed with blue slate. The inside fittings of the chapel and the rostrum will be of pitch-pine. Behind the rostrum will be spacious vestries. The internal dimensions of the building will be 54ft. by 35ft., and 25ft. high, and will accommodate 320 persons. The total cost will be £1,100. Mr. J. Hicks, of Redruth, is the architect; Messrs. Penter and Cossentine, of Polruan, are the contractors.

The Palace of Holyrood is being re-roofed for the first time during 200 years. The work is being done by instalments, which have extended over the autumn of each year. The north wing and the eastern portion of the building having been first dealt with, the roofing of the "Queen's Apartments," on the south side of the quadrangle, is now in progress. This section of the work will be completed by the end of the year. The whole of the roofing will then have been renewed, at the cost of something like £5,000. Mr. Robertson, of the Board of Works, is superintending the work.

A new Baptist chapel, seating 130 persons, was opened at Little Coxwell, near Faringdon, on Thursday week. Messrs. Sheppard and Davis, of Faringdon, were the contractors.

The fifth half-yearly report on the progress of Newhaven harbour was submitted by the engineers, and read at the company's meeting on Wednesday. It stated that the capital expenditure now amounts to £98,060 10s. 4d. Fair progress has been made with the new works. The concrete wall on the west side of the harbour has been nearly completed, and the foreshore at the back has been filled in with material excavated from the cliffs. About 180ft. of the breakwater up to the full height have been completed, and the works in connection with the new quay on the eastern side, and the construction of a new western pier, are in active progress.

At the meeting of the Llandudno School Board, held on Tuesday, a report of the special committee was read, stating that at an interview had with the architect of the new schools, Mr. A. Foulkes, he expressed himself ready to accept 4½ per cent. commission on all outlay, exclusive of building site, leaving the Board to allow him anything in addition for extra trouble with the designs. The committee requested Mr. Foulkes to send this agreement of 4½ per cent. to the Board in writing; but instead, he sent to say that, considering all the trouble he had, he was entitled to 5 per cent. The members of the committee thought Mr. Foulkes had scarcely carried out what was intended, and it was resolved by the Board to write him to the effect that his letter could not be submitted to the Board, as it was not in uniformity with what had been agreed upon at the committee.

The Liverpool City Council discussed on Wednesday whether it should utilise a recently cleared site known as Nash-grove for the building of labourers' dwellings, or wholesale markets, or should let the land without restrictions. It was decided to adopt the first proposition as recommended by the borough engineer. Dwellings of four and five stories each, suited to the working and labouring classes. will be erected at an estimated cost of £60,000, and it was held out by Alderman A. B. Forwood, who moved the resolution, that the money could be borrowed by the corporation at from 3½ to 3¾ per cent., while the dwellings will bring in, after making all necessary deductions, at least 6 per cent. on the outlay.

Plans for a new detached infirmary of 40 beds have been prepared for the committee of the Royal Albert Asylum for Idiots and Imbeciles, by their architects, Messrs. Paley and Austin, of Lancaster.

Mr. Edward Mackenzie, of Fawley-court, Henley-on-Thames, died on Monday, at the age of seventy. He was the youngest son of the late Mr. Alexander Mackenzie, C.E., of Fairburn, in Ross-shire, and leaves behind him a colossal fortune, made as a civil engineer and contractor. He was a man of mark in connection with his elder brother, the late Mr. William Mackenzie, and the late Mr. Brassey, in the early and palmy days of the railways, they being the contractors for gigantic works in France and England. They were all men of great administrative powers. Mr. Edward Mackenzie lived for a quarter of a century at Fawley-court, which estate he purchased on retiring from business. The house abounds with valuable paintings and works of art; it was built by Sir Christopher Wren, after the demolition of the former mansion, during the great Rebellion.

HART'S PATENT
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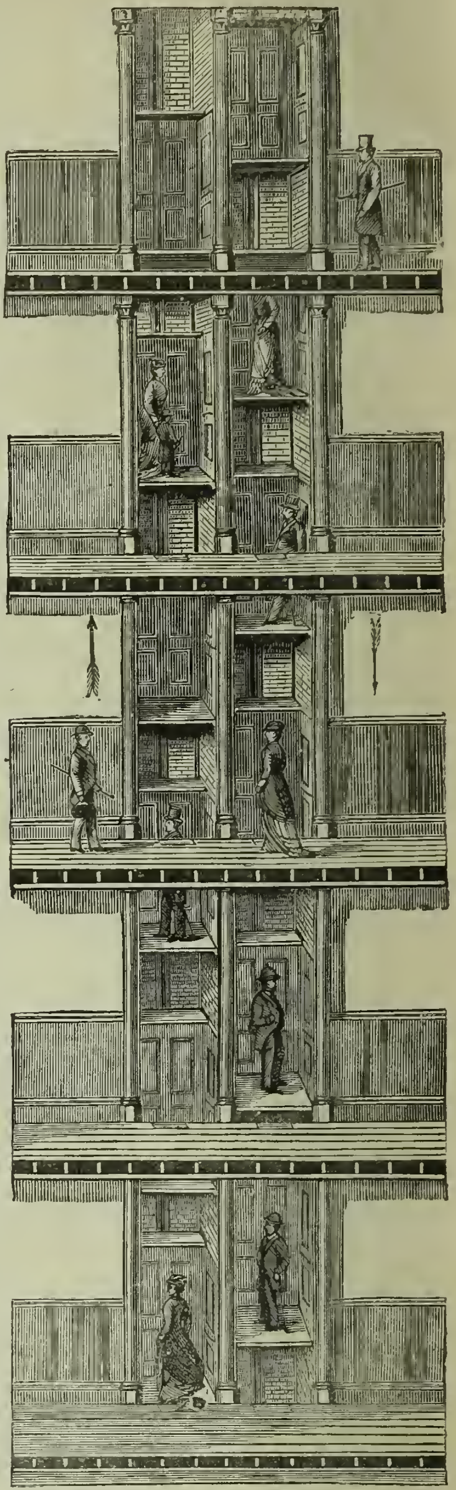

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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 8, 1880.

NEW BUILDINGS AT THE EAST END OF LONDON.

At the East-end many enterprising tradesmen have lately rebuilt their premises upon a larger scale. The Bethnal Green-road at the City end presents a busy appearance; and the thoroughfare is in a stage of metamorphosis. Several plots of building land are to let on lease by the Metropolitan Board, not long since occupied by dilapidated houses; while several new premises and warehouses have been erected. We must particularly mention in the list, the Great Eastern new goods station and terminus, a very extensive range of sheds and buildings. The main station is built of red brick and terra-cotta, and will form an imposing structure, though as to its finished appearance we should not like to hazard an opinion. There are some heavy girders of wrought iron employed, and the buildings will be in a kind of Italian style. Messrs. Wells and Co.'s immense warehouse and premises in Shoreditch called the "Commercial Ironworks" are quite original of their kind. The architect has been emboldened to depart from the usual warehouse type, and has given the front a sort of railway station elevation. Two lofty towers with high roofs flank the façade, which is partly of red brick and warm-coloured sandstone, enriched by enamelled tiles in the gables. The lower story is spanned by two wide arches, and these comprise the shops, and the arched fronts are filled with rather commonplace ironwork, which it would be mere flattery to say adds to the effect. Perhaps the most noticeable feature in the composition, after the arched entresol arrangement, is the lavish use of ornamental tile as a facing. The design has certainly a character about it: we could not mistake it for anything else but a warehouse or a station, but the details are crude and meagre. The firm have very extensive warehouses, and every conceivable requisite for the house-builder and furnisher may be obtained here, from stoves and fenders to the most fashionable decorations. Queen Anne, Late Old English, French, and other styles of chimney-pieces and furniture form a special branch of Messrs. Wells' business.

On the north side of Finsbury-square considerable alterations and street improvements have been made, and several blocks of industrial dwellings have been built. Great Eastern-street is a new road; here is to be seen a block of "flats" in a Gothic style, the materials used being red brick and stone in the entrances. The design is a trifle better than the very stereotyped blocks of dwellings in the rear erected by the Improved Industrial Dwellings Company. It has been named Chichester House. The Gladstone buildings, by the above company, appear to be fully tenanted; in these the staircases are arranged on the open or balcony plan, but at Chichester House the staircase is enclosed and lighted by windows above the entrance, and the steps are of patent concrete. We might stop to wonder why it is these blocks of dwellings have not been more artistically treated, were it not that the promoters of them have thought it necessary to rigorously follow a pattern; but even in this case, the open staircase might be made a far more pleasing feature than it is in these buildings, *e.g.*, by a dormer roof and emphasised balconies. As they are managed the open staircase gives a kind of warehouse-hoist look to the front, and the level roofs and monotonous details have almost a prison-like aspect. It would be desirable if in building any more on this plan the company could try a change in the elevation. Such buildings might be pleasingly built in a Queen Anne or Old English style if the excesses of the school were avoided. Nothing is more deadening to art or more repugnant to the occupants than the repetition of the same type of elevation, as if they were all from the same mould; but this seems to be the rule followed in all Government and other buildings where regulation plans are provided.

In a very different spirit is the new building which Mr. Sedding has added to the hospital of St. Mary-at-the-Cross, in Leonard-square. The style that has been selected is more domestic in feeling than the original Gothic buildings by Mr. J. Brooks, though the new work has been blended with the old in a masterly way. We might call Mr. Sedding's work Late Flamboyant or Flemish Gothic, in the main features in the fronts to Leonard-square and to the courtyard. The façade cuts off the angle between two streets and forms with the old hospital a triangular enclosure which has been treated in a thoroughly Continental manner. An arcaded cloister surrounds this internal court, in which the arched openings are of stone with flat arches of ogee form, producing a quaint contrast with the earlier and Geometrical openings of the old cloister. Red brickwork has been agreeably blended with the stone in the piers where diagonal courses of stone are worked with the red brick. Square lights subdivided, form the heads of the cloister arcading, and above this is a deeply moulded corbelling over which the upper story projects. The front is equally piquant, broad, and simple. Three dormers break the main part; these are close slated and project with boarded, ribbed, pointed soffits underneath, and look thoroughly English and homely in character. The upper story is corbelled out by a stone corbelling from the lower part, and the latter is pierced by openings within square heads filled with Late Flemish tracery. The brickwork is relieved by bands and diagonal courses of stone, and the mixture of the green-toned roof and neat slate dormers is particularly happy. On one of the return sides of the front is the entrance, carried up as a tower with open arched stories or landings, and finished above with a saddle-back roof of slate projecting boldly in front over stone corbels. The entrance has a flat ogee-shaped arch, and is divided from the outer lobby by a stone traceried screen. Internally the plan follows the original scheme of Mr. Brooks, whose design was illustrated in the Building News, 1875, Vol. XXIX., p. 586. The wards partake of the form of the boundary, and will be finished with high dadoes having Dutch painted tiles. On the whole, the work is less heavy in character than the original. Mr. Bone, of Cornwall, is the builder, and Mr. Longden, engineer, of Sheffield, we hear is carrying out the heating arrangements. As an attempt to produce external colour a new warehouse recently built in Ropemaker's-street, leading from Finsbury-place, calls for a passing word. The building, of several stories in height, is a combination of materials, the piers between the windows form large pilasters, and are faced with white and grey enamelled bricks of four and three courses alternately. These are relieved by the panels of terra-cotta modelled in relief between the windows forming the recessed face of the building. The openings are divided by cast-iron pillars and the cornice and upper story are built of terra-cotta, in large blocks of a warm buff colour. The frieze over the pilasters is arched in large blocks of the same material. The ground-story is finished with dark enamelled bricks of a chocolate-colour, and the lower entablature is of the same material. A pleasing result is obtained; the grey-tinted bricks with the white and dark-red panels make a harmony of colour without garish effect; but the chief question is whether the colours will long survive the London atmosphere. Some enamelled bricks have been found to peel on the surface, and it may be of interest to watch the effects of smoke upon them. The experiment is a useful one, and may lead to other attempts to apply enamelled bricks of different tints. The work is creditably turned out by Mr. Woodward, of Finsbury.

STABILITY OF WATER-TANKS.

The recent catastrophe which has occurred at the Crystal Palace, from the sudden bursting of a large iron tank, may well draw public attention to the dangers arising from the storage of water in vessels of this description. Nearly all the principal railway stations, as well as numerous factories, theatres, and other public buildings, are provided with huge iron tanks, placed at a considerable elevation, for the supply of water to engines, or for security against fire, and unless these are well looked after, and kept in good repair, they may prove a source of danger both to life and property. In the present article we propose to consider the mechanical principles involved in the construction and maintenance of water-tanks, in order that the cause of their bursting may be clearly ascertained, and due precautions taken against the occurrence of such disasters.

In the first place, we have to ascertain the amount of pressure produced against the sides of a tank when filled with water, and the position of the resultant of the forces; in the next place to consider how the pressure can best be counteracted, and the strength of the materials to be employed in the construction of the tank.

To find the pressure on the vertical side of a tank filled with water, we make use of the following principle in hydrostatics, viz., the pressure of a fluid on any surface is the weight of a column of the fluid whose base is equal to the area of the surface pressed, and whose height is equal to the depth of the centre of gravity below the surface of the fluid. The depth of the centre of gravity of the side of the tank being halfway between the top and bottom, the pressure on the side must be the area of the side in square feet multiplied by half the depth in feet, multiplied by the weight of a cubic foot of water, or 62·5lb. Now, the tank which burst at the Crystal Palace is reported in the public journals to have been 48ft. square and 20ft. deep; consequently, the horizontal pressure upon one side of it when filled with water would amount to

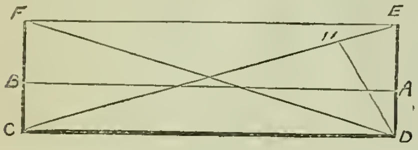
$$62{\cdot}5 \times 48 \times 20 \times 10 = 600{,}000\text{lb., or } 268 \text{ tons.}$$

The resultant of all the horizontal pressures on the side of a tank acts at a point called the "centre of pressure," or that at which a single force can be made to counteract the whole pressure, provided the side maintains perfect rigidity. This point is ascertained by mathematical investigations to be at one-third of the height of the side from the bottom of the tank, and would be in the Crystal Palace tank 6ft. 8in. from the bottom when it was full of water.

From the principle first stated, it will be seen that the pressure on the bottom of the tank is the same as the weight of all the water in the tank; but as the bottom is always made to rest on a solid basis, we need not trouble ourselves about any other part than the sides.

The thickness to be given to the metal forming the sides is the first thing to be considered, but when iron is used it would involve a great waste of material if the sides were to be made sufficiently thick to resist the pressure of the water without any extraneous help; they are, therefore, generally made of moderately thin plates of cast or wrought iron, bolted or riveted together, and the pressure counteracted by iron tie-rods placed across from side to side. The thickness of the plates ought *theoretically* to be proportioned to the pressure they have to sustain, and as this is greatest at the bottom, and diminishes regularly towards the top, where it is zero, the section of a plate should properly be in the form of a triangle with the base downwards. Practically, however, it is found more convenient and less expensive to have the plates uniform in thickness throughout, and to trust to tie-rods to countervail the pressure outwards.

There are several different ways in which tie-rods are fixed by makers of large tanks: by some they are placed horizontally at the top, as E F (see Fig.); by others diagonally, as E C and F D; while by others they are placed horizontally at the centre of pressure, as A B; and this last is the most scientific and effective position for the tie-rods. Let us just consider how the forces will act in all three of the above cases. In the first, where the tie-rod is at E F, the sides are held firmly together at top and bottom, but the resultant of the outward pressures acting at A will tend to bulge out the side at that part, and a great thickness of plate will, therefore, be necessary to prevent this.



Taking l to represent the length of a side in feet, d its depth, P the horizontal pressure in lbs., we have

$$P = 62{\cdot}5 \times l \times \tfrac{1}{2}d^2$$

the resultant of which acts horizontally at one-third of d from the bottom. Let T be the tension in the rod E F, and if we suppose D to be immovable, then by taking moments of the forces P and T about D, we have,

$$P \times AD = T \times ED, \text{ or } T = P\frac{AD}{ED}$$

which gives the tension in the rod.

To find the outward pressure (Q) at D, we take moments of P and Q about E, so that

$$P \times AE = Q \times DE$$
$$\text{or } Q = P\frac{AE}{DE}$$

which is the force tending to wrench away the sides from the bottom.

Next, suppose the tie rods to be fixed diagonally as EC, FD, and let T be the tension in E C; draw D H perpendicular to C E; then, taking moments about D, we have,

$$P \times AD = T \times HD,$$
$$\text{or } T = P\frac{AD}{HD}$$

which gives the tension in each of the rods.

When the ties are placed at the centre of pressure as A B, there will be the maximum strain (P) in the rods, but much less tendency to bulge in the plates than if placed in either of the other ways; as the pressure diminishes upwards from A towards E, and therefore the top of the plate will not require to be held in; while at the bottom, D, it is held firmly by the plates forming the bottom of the tank. The strength of the ties should be sufficient to support the whole of the thrust of the water on the sides; and also that they should not stretch in any perceptible degree when strained. If one square inch of section be given to the rods for every 5 tons of strain, their strength will generally suffice, provided it is not diminished by any other cause, such as the corrosive action of air and water, which, by reducing the dimensions of the rods and plates, proportionally weakens their power of resistance; and it is to this cause that the bursting of such tanks is probably owing. It will, therefore, be advisable, in order to secure safety, either to make the iron much stronger than would otherwise be necessary at the first, in order that allowance may be made for corrosion; or, better still, to inclose each rod in a thin tube of iron or lead, which would entirely protect it from decay, and the effects of neglect.

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THE PHOTOGRAPHIC SOCIETY'S EXHIBITION.

THE gallery of the Photographic Society of Great Britain, now open at 5A, Pall Mall, East, shows an advance in several branches of photographic art. Some of the photographs, such as the views taken during the second Dutch Arctic Expedition of 1879 upon gelatine plates by Mr. J. A. Grant, Nos. 3 and 17; the instantaneous views exhibited by W. Mayland, for which a medal has been awarded; the Burnham Beeches, by Lieut. L. Darwin, R.E.; the Instantaneous Studies of Swans, by Marsh Brothers, which have gained a medal for extraordinary and beautiful results, are instances of the value of that process in producing rapid pictures, marvellous for vigour and exquisite detail. But the visitor will be rewarded by seeing other developments of the art. The Woodbury type process has reached almost perfection in the hands of the Woodbury Permanent Printing Company, and the reproductions of works in which delicacy of tone, depth and permanency, are prominent, are a flattering testimony to the value of this art. The Platinotype process is another method of printing of which we see various exceedingly artistic productions in the present exhibition. But let us rapidly review the more striking reproductions of the art; and we may observe that our survey will be chiefly limited to those works which exhibit artistic qualities, and we shall not attempt to pass an opinion upon the relative merits of different processes in a technical sense. Mr. Charles Sand's View of St. Paul's, taken by Fothergill's collodion-albumen process, is a pleasing group of buildings; but our eyes quickly alight on Vernon Heath's fine enlargements—Foreground Studies, Nos. 7, 16, 18, of bramble, furze, and ferns, &c., vigorous transcripts of Nature well adapted as studies for the artist of landscape. No. 11 is a frame of considerable interest to the architect and engineer, as it contains several excellent views of the Tay-bridge disaster. The large girders before and after the disaster throw much light upon the details of the ironwork. The fallen girders and the wrecked pier are minutely transcribed, and such aid as photography can throw upon that unhappy event is here admirably exemplified. We have also a view of the wrecked engine and carriage of the luckless train, as they were found after the accident. Messrs. J. Valentine and Sons are the exhibitors. Mr. Mayland's Marine Views (gelatine plates) are admirable examples of instantaneous printing, and the lines under them—

> "And from the bosom of the busy stream,
> These in the fraction of a second snatched,"

are singularly appropriate. Mr. Mayland receives a medal. The Autumnal Views (20) by Mr. T. M. Brownrigg, are brilliant in finish; the views of thicket and pond in Surrey are also soft and truthful pictures.

The visitor cannot pass by the Hermit's Tree (No. 22), nor some excellent work by R. R. Brown, John Spiller, &c. An interesting series of views of architectural subjects is contributed by Mr. Harvey Barton, who takes a medal, and we single out the St. John's Church, St. Peter's Hospital, St. Stephen's Church, Bristol, among the buildings illustrated, many of them striking photographs taken by the gelatine plate and wet collodion processes. A Woodland Cot (37) is a vigorous and charmingly-toned picture; so are Nos. 41 and 42. E. Dunmore's views at Ramsgate and other places are noteworthy examples of the gelatine plate. The School of Military Engineering send some effective photographs (wet collodion), and the gelatine riverside sketches of C. A. Ferneley are clever. As specimens of autotype prints from gelatine plates, we must bestow a word of praise on Mr. Charles Bennett's Sussex churches; and the landscapes and views in Leicestershire, Derbyshire, Staffordshire, &c., sent by Richard Keene, are clear and exquisitely printed. To the representation of interiors photography has not lent itself with any great success, owing to the difficulty in the management of the light. Mr. Manfield's views of the interiors of Haddon, Ely, and Lichfield (gelatine plates) are reassuring however. As showing what photography can do in artistic grouping, the fine photographic portraits and studies by R. Faulkner, chiefly of children, Nos. 95, 96, 146, are extremely interesting. The prints are in red colour, and the gradation of tone, light, and shade, and vigour of execution are equal to water-colour or crayon. The prints of St. Mary Redcliffe, and St. Werburgh's, Bristol, are clear and vivid representations in the wet collodion process; near these we find some lovely views (gelatine plates) of Welsh scenery; those of the Lledr Valley are sharp and defined, and all the variations of rock, the light and shade, the pearly tints of distance are rendered with a power which almost equals the artist's pencil in breadth. Mr. A. Clout is the exhibitor. Mr. Whaite receives a medal for his studies in a bedroom, No. 101, showing some capital work on gelatine plates.

A recent development of photographic art is shown by the Autotype Company (118) in the centre of the gallery. It is a large frame of Keramic photographs, or photographs burnt in on imperishable materials, such as china, tiles, and plaques, and some beautiful pictures and portraits are to be seen. One is a warm-toned portrait of Mr. Bright. By this process miniatures can be taken, and photographs may be copied. The same company show what can be done in the printing press to render this art artistic in its results. The portrait of Mr. Gladstone, from an oil-painting by Girandot; the enlargements printed in the ordinary press by the callotype process (149), Nos. 157, 159, 164 are good examples of autotype enlargement. Those from negatives by Mr. J. Thomson are vigorous and bold. Wick Hall, Brighton, is a view by wet collodion taken direct; No. 121 shows a winsome face in bonnet, looking out of the corner of one eye, by Mendelsohn; these are studies after Rembrandt, and show striking effects of light and shade. Some full-size portraits are to be seen; among these we notice No. 133, an enlargement printed in carbon by T. R. Annan, of the late Dr. Barclay, of Glasgow University. Three nice figures are shown by Messrs. Fry, gelatine plates; and Messrs. Lock and Whitfield exhibit a large bright portrait in 148, a carbon print. The Steam Launch (140), photographed while going at full speed, the exposure being only 1-150th of a second, is an instance of what may be done on a sensitive plate. Many examples of instantaneous photography are to be seen; the "Henley Royal Regatta" (288) is a clever instance of an exposure of 1-130th of a second. The result is admirable, the boats and the flash of oars are rendered clearly, even the glitter and sparkle of the water. Mr. G. W. Williams (170), Marsh, Bros. (246), and T. M. Brownrigg exhibit marvellous specimens of instantaneous work. The "Flying Dutchman" (246), the steamship "Carham" (251), Nos. 261, and 264 are creditable, if we cannot view them as artistic successes. In this connection we may mention Cadett's patent instrument, manufactured by Marion and Co., called the "Instantaneous View shutter," by which ingenious invention a view can be regulated to any degree of exposure from half an hour to 100th part of a second. The shutter can be thus moved with a rapidity which dazzles the eye. By its means and the gelatine plates, which are very sensitive, any exposure, according to the light, may be secured, and the artist can catch the very glitter and sparkle of the ripple as in the view of swans, by Marsh Bros. No. 143 is a finely developed head, a carbon print untouched; 150, a group of portraits (gelatine). The views of Norwich by the Autotype Company, especially Erpingham Gate, cloisters, and Norman arches of cathedral, are remarkable for delicacy and gradation of tone. No. 162, "Views in Herts" (gelatine emulsion, untouched); and 166, sketches from Tintern, soft and delicate, almost like sepia, are noteworthy. On the screens we find some clever work; the photogravures of Turner's Liber Studiorum, exhibited by the Autotype Co., are interesting copies of artistic work, and almost defy detection. No. 354 is a fine interior, by H. Manfield, and the views of Old London, by Henry Dixon, are worth the attention of all architects. We congratulate the "Society for Photographing Relics of Old London" on the 6th year's issue of views, which are to be found in a portfolio on the table. These views comprise various prints from the Charter House, besides the "Oxford Arms" Inn, Warwick-lane; old houses in Drury-lane and Lincoln's Inn; Shaftesbury House, Aldersgate-street; Sir Paul Pindar's house, and others in Leadenhall-street, Gray's Inn-lane, &c. Many of these photographs ought to find a place in the portfolios of the architect's studies; but their value, archæologically, is of even greater importance now that the old relics of London are disappearing so fast. The photographs are permanent, and the size 10in. by 8in., on mounts 18in. by 14in. Mr. Dixon, of 112, Albany-street, Regent-street, is the photographer, and Mr. Alfred Marks, of Long Ditton, the treasurer. Other photographs of architectural interest are to be found in the gallery. The views in Brittany and Normandy, by J. Gale (256), are sharp and artistic. G. Nesbitt contributes fine figure subjects (187, 188). The Platinotype-printing is represented in a few excellent works. Mr. Holyer shows (304) a copy of the "Golden Stairs" by L. Burne Jones, and several specimens of permanent platinotype printing are exhibited by the company of that process (326 to 336). Nos. 326 and 327 are charming views in oak frames, and there is a pleasing greyish tone to the prints; the lilies and lilacs from negatives, by F. Holyer, are also brilliant pictures of nature. On the screen we notice samples of gelatine, instantaneous, the wet collodion, and other processes; and printing with various metals on plain paper, by T. Werge, as the brown tints produced by the ammonia nitrate of silver and nitrate of uranium. H. P. Robinson, Andrew Pringle, Silvester Parry, the Berlin Photo Co., receive medals.

To the student of photographic art the Exhibition is particularly instructive; examples of the various processes may be found, from the wet collodion to the rapid dry gelatine plates, and the most obstinate admirer of the old process cannot fail to remark that the later work equals the finest and most delicate of the wet collodion pictures. He will also find the progress made in instantaneous photography; the dry plates will be found to fix as readily as wet collodion, and the processes for permanent printing will be hailed by all who desire to see photography become an art of more than ephemeral value.

ANCIENT LIGHTS.—III.

As the right to certain window-lights may be acquired by occupancy, so may it be lost by abandonment. We have seen that, under the Prescription Act, a twenty years' user of lights gives an absolute and indefeasible title to their enjoyment. In the same way, a twenty years' non-user will destroy that statutory title. When a window has been shut up for twenty years, the case stands as though it had never existed. For, during that period, the servient tenement has acquired an easement similar to that enjoyed by the dominant, and so their rights are equal as against each other. In this case the intention of the parties is immaterial, the mere length of time being all that we have to consider. But a far shorter period of non-user will also operate as an abandonment of the right, if there be evidence that there was an intention that it should be so abandoned. In settling the question whether, in any particular case, such an intention existed, regard must be had to all the facts, and the position of the parties. But it is important to bear in mind that, if a man do an act which looks like an abandonment of his ancient light: the burden of proof of showing that such was not his intention falls upon himself. The whole theory of the right being founded upon enjoyment, the cessation of that enjoyment is *primâ facie* evidence of its abandonment. If, for instance, the owner of the dominant tenement pull down his house and build up a blank wall where formerly he had windows; then, it will be for him to prove that, in so doing, he had no intention of abandoning the right to ancient lights which he had acquired. It comes, therefore, to this: that any temporary disuse of a window may be evidence of its abandonment, according to the whole facts of the case as they may be interpreted by a judge or a jury, with whatever aid they may receive in so doing from the conduct of both parties in the matter. Here we see that the intention is everything; but there is yet another way in which the right may be legally abandoned, even though there be no proof of any such intention. For, if the dominant owner acts in such a way as to lead the servient owner to believe he has abandoned his right to ancient lights, and thereby induces the latter to incur expense in building and altering his position upon the faith of this belief, the Court of Equity will prevent that dominant owner from ever claiming his right again. This is obviously the converse proposition of that already laid down as to the acquirement of a right by the acquiescence of the servient owner, and is equally founded upon equitable doctrines, which are now of universal application. The points to be proved in such a case are the conduct of the dominant owner, the belief of the servient owner, and the fact of his incurring expense and changing his position upon the *bonâ fide* idea that the ancient right had been abandoned.

The next question to be considered is that of alteration, which comes so near to that of abandonment as to have caused much confusion in the cases. But all this was swept away by the decision of the House of Lords in "Tapley v. Jones" (34 Law J. Rep. N.S., C.P. 342), already mentioned, wherein the lines of principle were lucidly laid down for future guidance in practice. The plaintiff bought a house, with ancient lights on all three stories, overlooking the defendant's premises. He enlarged two of these lights, but left the third unaltered. The defendant then built up a wall obstructing all the lights, as he could not block the new windows without also blocking the old. The plaintiff thereupon restored his ancient lights to their old position, and went to the Court for an injunction against the defendant to pull down his building. It was a very puzzling question what was to be done; for the defendant had clearly a right to obstruct the plaintiff's new windows, though, on the other hand, he had as clear a right to receive light and air through the old ones; and the defendant could only block up altogether or leave them all alone. Lord Westbury began by clearing away two fallacies, which, however, are still always cropping up in the discussion of this question. There is no such thing as a "right to obstruct," for every man has only a right to build upon his own land, subject to such rights as his neighbour may have acquired over it. Nor is there any legal wrong in the so-called "invasion of privacy by opening windows," nor any legal remedy for the grievance. If, therefore, a man has acquired an absolute and indefeasible right to an ancient light, he cannot lose it by opening two new ones. These new windows are no injury to his neighbour, who may block them up if he can do so by building on his own ground; but the fact that they are there gives him no right to block up the old window, as to which the right has become, by statute, absolute and indefeasible. The same argument applies to the enlargement of a former window. This, in itself, is an innocent act, and cannot lead to the loss of the acquired right to the ancient light. But if the servient owner can block up the new part part without injuring the old, he may do so, and if not, he must let it alone. No one can be said to have abandoned an ancient light by enlarging it, for on the contrary, this is clear evidence of a wish for its more extended enjoyment.

Where a house is burnt down, or pulled down, questions may arise as to the abandonment of the ancient lights, and also as to whether the right is applicable to the new windows. If the land be used for tillage during some years, this would be strong evidence of an intention to abandon the old window-lights, but not so if it were merely left idle. Thus, as to cases in which the building is rebuilt, the modern rule is that the windows must be substantially the same. They need not be opened in the identical places of the old ones, nor of exactly equal size; but their area must be pretty nearly the same. The principle that will be applied in practice is, that the new windows must not impose either an additional or a different servitude upon the servient tenement to that which formerly existed. But trivial changes will not take away the right to ancient lights which was acquired by the old windows, and there must be some material alteration in the nature or quantity of light to bring about this result. On the other hand, where the servient owner is rebuilding his premises, it is the duty of the dominant tenant to look at the plans, if they be then offered for his inspection. Should he not object to the alterations proposed, and allow the building to go on, he will not afterwards be able to get an injunction if it in any way obstruct his light. This proceeds upon that same equitable theory of acquiescence to which we have already referred, and is both common sense and common justice. For, if a man allow another to incur expense in this way, he ought not afterwards to be permitted to come in and ask that work should be undone, the doing of which he has himself, at least tacitly, encouraged. In such cases, therefore, the conduct of a dominant owner who looks on while plans are carried out which he has had an opportunity of inspecting, is treated as in law an abandonment of his right in the ancient lights which will be obstructed by the new buildings upon the servient premises.

The form of defence to an action for an injunction to restrain the blocking up of ancient lights, or for damages, must, of course, vary with the facts of every particular case. In general, there will be a denial that the lights are ancient as alleged by the plaintiff; and, upon this point, there is always plenty of contradictory evidence forthcoming. Where it is stated in the claim that the window in question was enlarged with the consent of the defendant's predecessor, that also will be controverted in the defence. Then, again, very important points may arise if the owner of the ancient tenement be a recent purchaser, for the plaintiff will have to prove that he bought with notice of such an agreement. Courts of Equity have lately shown a disposition to carry the doctrine of constructive notice, or a knowledge arising from facts that can be seen, somewhat too far. But this tendency was greatly checked in the recent case of "Allen v. Seckham" (Law Rep. H. Chy. Div. 790), where the Court of Appeal reversed the Vice-Chancellor's decision, and held that, the mere fact of there being windows in an adjoining house which overlooked the purchased property was not constructive notice of any agreement giving the right of access of light and air thereto. All that has been said as to the loss of the right by abandonment is matter for a defence, and will have to be stated, and supported by evidence at the hearing, if it be relied upon to justify an obstruction of windows that are, or were, admittedly ancient lights at some time or other. It was attempted in the recent case of "Theed v. Debenham" (Law Rep. 2, Chy. Div. 165) to argue that the Metropolis Local Management Act Amendment Act, which regulates the height of buildings in the streets, limited the right to ancient lights. But the Court held that this had nothing to do with such a right as acquired by prescription, and that the question to be decided depended upon the amount of obscuration in each particular instance. Still more important was the case of "Moore v. Hall" (Law Rep. 3, 2, B. D, 178), which laid down the rule to be that the proper measure of the right was not only the purpose for which the light was then actually being used, but also any purpose for which it might hereafter be made applicable. It was, therefore, in defence to show that the obstruction did not prevent the plaintiff from carrying on his business, if it were such as to interfere with the carrying on of any other business for which more light would be required. This decision proceeds upon the principle that the damage to the premises is the point to be considered, and not alone the purpose for which they are then being used, but the possible purposes for which they may, in the future, come to be employed.

As to the cases in which injunctions have been granted, they are endless in their variety, but we may quote a few examples. Where a drawing-room window was faced by a wall 10ft. high at a distance of 12ft., and it was proposed to raise this wall to 48ft., an injunction was at once granted. The backs of the houses of plaintiff and defendant were in a straight line. Plaintiff's windows looked into an area 27ft. wide. Defendant proposed to build out a bow 10ft. in length by the side of this area, but an injunction was granted. In another case it was held that the raising the opposite houses in a street only 20ft. wide from 36 to 60ft. was such a material interference with the plaintiff's enjoyment of his premises for business purposes as to entitle him to an injunction. It has been decided that the provision of the Building Act, 14 Geo. 3, c. 78, s. 43, afford no protection to a person who, by raising a party-wall in compliance therewith, has obstructed his neighbour's lights. Coming to the question of alteration, we find an important decision in the recent case of The National Provincial Plate Glass Co., and The Prudential Assurance Co. (Law Rep., 6, Ch. 7, D. 757), where a building containing ancient lights was pulled down and replaced by another in which the front was set back and a dormer window converted into a skylight, and it was held that the right to access of light had not been lost. With regard to the rule by which the claimant will be guided as to granting an injunction, the latest authority is that of "King v. Rudkin" (Law Rep. 6 Chy. Div. 160), which was decided since the Judicature Acts, and where it was held that the plaintiff, in an action to restrain an alleged obstruction, cannot obtain an injunction unless he proves substantial damages. It was further laid down in this case that where a plaintiff has opened a claim for substantial damages and failed to prove it, the Court will not direct an inquiry as to damages. This really means that the plaintiff would lose the whole benefit of his action by having claimed too much, and it should act as a warning to intending litigants. But in this respect the whole law of window-lights is a dangerous quagmire for the unwary, and however clear may seem to be his case, no man would be wise to take it into Court without having first carefully consulted his solicitor. We have endeavoured to put together a few hints that may help men of business in arriving at some conclusion upon a most perplexing subject; but seeing that the legal theory of ancient lights is so technical, while its practical application depends so greatly upon the facts, we desire to end with a word of caution to those who may hastily be meditating an action.

A CONCRETE DOME FOR INDIA.

An unusually interesting example of concrete construction has just been completed at Bromley-by-Bow. The instance referred to is the large dome intended to cover the central hall of the Takhtsingji Hospital, Bhavnagar, India, which is now being built from the designs of Mr. William Emerson, architect, of Westminster-chambers. Concrete domes are common in India, but no facilities are available for the building of an elaborately-detailed interior in concrete, such as was desired in this instance to construct, while the cost of so rich a style of architectural enrichment, if executed in stone, precluded the use of that material for the domes of the buildings now referred to, to say nothing of the difficulty of obtaining stone in sufficiently large blocks for the purpose.

In a style depending so largely as Hindoo architecture does upon a repetition of elaborately intricate detail, concrete furnishes an admirable material in which such parts may be advantageously composed; the balusters, for instance, some 800 in number, were all made by Mr. Lascelles in his concrete, and sent over ready to be fixed in the positions they now occupy, and we think Mr. Emerson has done wisely in adopting the admirable material in question. The fine dark red colour which has been obtained completely to match the local stone used for the walls of the Hospital at Bhavnagar, is also a primary recommendation to its use, and we are assured that the colouring coat, which is about $\frac{3}{4}$in. in depth, is in perfectly permanent colour, and entirely free from any likelihood to fade after exposure to the sun—a failing peculiar to several of our red building stones in England. The dome, which we have inspected this week, is about 27ft. in diameter, and constructed with ribs, which form a kind of centring in themselves, and it is upon the ribs that the rings of roofing-slabs are laid, without the aid of centres. Each rib on the under side consists, as it were, of a series of consoles or trusses, inverted, and gradually diminishing in size as they approach the crown, after the characteristic manner of Hindoo domical roofs, with pendants at each interval between the divisions of the rib The rib constructively is in three pieces, having a strong core of iron, which material, in a lighter form, passes through all the chief portions of the concrete work. The slabs groove and tongue-joint all round into each other, with a weathered surface at the jointings outside, the soffites being elaborately enriched with an effective diaper design, which in its turn diminishes towards the apex of the drum. The ribs and lower rings of the covering slabs are made of concrete, which is as heavy as Portland stone; the upper rings and lantern, with lions at the angles, being as light as pumice-stone, so that when the dome is put together a well-balanced and solid piece of construction is the result; while from an artistic point of view the effect, in the strong reflected sunlight of India, will, we should say, entirely realise the intentions of the architect, whose experience of building and success in India are so well known. The hospital is being built by His Highness Thakore Sahib for the use of his subjects, and the work has now been in progress since January last year. Mr. R. Procter-Sims, the executive engineer of Bhavnagar State, is supervising the execution of the buildings, from Mr. Emerson's details and general drawings. The hospital on plan is a long parallelogram, having a domical pavilion at each of the four extreme corners, with the big dome already described as a central feature. The construction is entirely fire-proof, excepting the roofing timbers. The building provides accommodation for fifty beds, and these are arranged on two floors, in various wards for males and females, verandahs being provided all round the several sides of the rooms, and these verandahs take the place of our corridors and passages. Bath and water-closet provisions are made in the four low angle towers at the ends of the building, and are disconnected from the wards by verandahs. The small domes over the angle towers are constructed, like the central one, in Mr. Lascelles' concrete. The design departs from the more usual Mahometan type of Indian architecture, which has been so continuously employed of late years for a large proportion of new Indian buildings, and a more Hindoo character is introduced. The facilities afforded by the Mahometan pointed arch for treatment of verandahs are, no doubt, a great advantage, and render a use of the more lintel-like style of Hindoo work proportionately difficult. Mr. Emerson has arranged the lower range of openings with square columns, carrying massively-projecting corbels, in three stages, which support doweled lintels of stone. Instead of horse-shoe arches in the upper tier of openings, a many-cusped arch is introduced, with a view to afford suitable spaces for carving, as it was desired to render the building, in these parts of the fronts, especially rich in carved ornamentation; and the spandrels of these arches seemed to offer an admirable opportunity for the display of such work. The modelling for the big lions to the lantern of the central dome has been vigorously done by Mr. Nicholl, the sculptor, who has modelled all the other figure-work for this building. One chief item of expense is, of course, the carriage; and it is very necessary that the concrete-work should be most carefully packed for its passage to India. For the re-erection of the domes which we have now described, an English workman will accompany the work, in order to insure its proper final adjustment.

NEW DOCK WORKS AT GRANGEMOUTH, N.B.

During the past spring and summer the new dock works which are being executed for the Caledonian Railway Company at Grangemouth have been making substantial progress. The main entrance to the new docks and timber basin is about half a mile lower down the River Carron than the entrance to the present docks, and will be much more conveniently situated for vessels. An entrance channel, about 700ft. long by 200ft. broad, leads from the Carron to the entrance lock, which is 55ft. broad and 350ft. between the gates, and will have a depth of water at high tide of 26ft.

The new dock is 1,320ft. long and 400ft. broad, and will contain an area of 11 acres of water, 26ft. deep. With the exception of a small extent of coping on the south wall, the dock is complete, and ready for the sheds, causewaying, and rails. The new timber basin, which is simply a continuation of the dock, with the earth taken out to a less depth, and of course without walls, is also finished, and will contain 8 acres of water, and 8ft. deep. A channel, 70ft. broad at the bottom, leads from the new dock through the timber basin to the existing dock. This channel is 15ft. deep, and will enable vessels to pass from one dock to the other, and at the same time will permit timber vessels to discharge their cargoes at once in the timber pond. A second channel, 20ft. wide and 14ft. deep, branches off the main one at the west end of the timber basin, and passes under the railway sidings and the Grangemouth and Bo'ness turnpike road, the sidings and road being accommodated with a swing bridge. A small lock is built in this channel between the two swing bridges, to join the levels of the two timber basins, the existing basin being six feet higher than the new one. The channels into the timber basins are finished, with the exception of the railway swing bridge; but as regards the channel into the dock a good deal of work has still to be done. A cofferdam is being built to enable the junction to be made with the present dock walls, and the foundations for a swing bridge for siding accommodation, and part of the walls of the channel are still to execute.

As part of the contract for the dock works, the railway from Grahamston to Grangemouth has been doubled, a new goods shed built at Grangemouth, and an addition made to the passenger station. The Bo'ness road, the main thoroughfare from the old town to the new, has been carried by a bridge over the Grahamston and Grangemouth Railway, thus doing away with the level crossings at the station. The walls of the dock, locks, and channels, and the foundations for the swing bridges have been built in a style similar to that adopted at the Albert Dock in London, recently opened by the Duke of Connaught. Instead of the usual stonework, they are built almost entirely of Portland cement concrete. About 100,000 cubic yards of concrete have been used in the construction of the walls and foundations of bridges. The walls are all coped with granite, and a large quantity of granite and freestone is also used in the quoins, sills, roller-paths, &c., of the two locks. In emptying and filling the lock the water is taken through pipes in the side walls, instead of the old plan being followed of using sluices in the gates. The works have been designed by Messrs. Blyth and Cunningham, C.E., Edinburgh, Sir Wm. Armstrong supplying the hydraulic machinery, and the remainder of the work has been executed by Messrs. Charles Brand and Son, Glasgow.

WATERPROOF COVERINGS.

AMONG the needs of the builder, some waterproof covering, cheaper and more generally useful than slate or asphalte, and more reliable than bituminous compounds, appears to be required. The Society of Civil Engineers, in America, have been discussing the subject of waterproof coverings, from which it is evident there exists considerable doubt as to the best protecting substance. Most of the substances used for covering are open to objections: they expand and contract with the temperature, and soon become of little use in keeping out the wet, by the cracks which take place; others are not durable. Among substances of these kinds we may mention coal-tar, felt, bitumen and sand, and asphaltes. Coal-tar roofs do not last long; the volatile oils, which give elasticity, gradually evaporate and leave them absorbent. The material gets at last like a brittle substance, and easily cracks, as may be observed by examining roofs coated with coal-tar.

Mr. F. Collingwood's paper on waterproof coverings furnishes some useful tests that were made upon materials sent by various competitors. Impermeability to water at all temperatures and durability were the main requirements. Wooden moulds with grooves, having enlargements at the end, were filled with certain mixtures. The long pieces cracked when exposed to a freezing mixture for 48 hours. Plates of the same material were also tried, and dropped to see whether they would break, and their hardness and degree of brittleness were in this manner discovered. For durability, the materials were exposed in a sand-bath to a temperature of 212° for 48 hours, and the percentage of loss noted; afterwards they were subjected to soaking in water, to find out if any absorption takes place, noting the increase in weight. The various samples offered for experiment were classified: "1, Alternate layers of coal-tar and felt; 2, mixture of soapstone, crude petroleum, and resin; 3, Trinidad bitumen (refined), and coal-tar, with admixture of sand; 4, asphaltic mastics, consisting of various mixtures of Val de Travers or Limmer asphaltes, with Trinidad bitumen, residuum oil, limestone, sand, &c.; 5, Trinidad bitumen with paper or felt in layers; 6, ditto, mixed with about 10 per cent. of residuum oil put on in consecutive layers." The tests showed the coal-tar and felt quite unreliable for permanent work; that No. 2 (soapstone and petroleum) was a good fire-proof roofing material, though there was a loss by boiling, and the price was too great. The best samples of the asphalts were found excellent, but were rather hard at low temperatures; the poorer mixtures failed by cracking, and others by absorption, while the best were expensive. No. 6 was accepted—a mixture of Trinidad bitumen (refined) mixed with 10 per cent. of residuum oil. A larger quantity of oil was found to make the material soft, but 10 per cent. gave substance not too soft when warm nor too brittle when cold, and was entirely non-absorbent, losing nothing when boiled. The price being lower than that of any other compound, the material was used in three layers to protect the concrete over some arches of a bridge. The total thickness of the layers was ½in.

Though these experiments are valuable in testing the merits of any material, we doubt whether they were exactly the tests an architect or engineer should accept. To test a certain material for a specific purpose, we contend it should be used in precisely the same manner it is intended to be in the structure, namely, laid in a certain thickness over brickwork or concrete, and exposed to the hot sun. Even with the thick layer of sand placed over the bitumen, the heat caused the latter to rise through the sand and begin to flow, from the evidence given by the author himself. We have probably at present no material of an impermeable kind so reliable as asphaltic mastic for covering structures, flats, or roofs. In France it is largely employed for this purpose, and is used without the addition of grit. It has also considerable tensile strength, though this quality is of less consequence to the builder than its free yielding to settlement, and its non-liability to crack from changes of the weather. Several sorts of asphalte are to be obtained; there is the "Seyssel," laid at from 6½d. to 9½d. per foot for half-inch layers; the "Val de Travers," from 5s. per yard; Claridge's and Barnett's, all good substitutes for slates and cements. Cannot some enterprising manufacturer find out a material offering the same advantages, equally durable, and also cheaper?

ORKNEY.

(From *The Times*.)

SHETLAND for scenery; Orkney for antiquities. This distinction marks off, in a broad and general way, the characteristic features of the two groups of islands. The great attractions of Shetland are the cliffs and precipices, the chasms and caverns, the natural arches and pillars, the voes and skerries and holms. In Orkney, the chief objects of interest are the works of prehistoric man—the brochs, or round towers, the chambered vaults, or tumuli, and the stone circles in a more or a less perfect state. Kirkwall, the capital of Orkney, is in every respect a more interesting place than Lerwick, the capital of Shetland. In some aspects the two towns are very much alike. The principal street of Kirkwall, in which the chief buildings stand, is a narrow lane, paved throughout its length and breadth with broad flags; but it has a causeway of small stones in the centre, which affords a reasonably sure footing to the horses and ponies. The streets that diverge from this one are broader than the corresponding lanes of Lerwick; roads leading towards the country are sooner reached; and altogether the town has a more modern appearance. The hotels in Kirkwall are a little in advance of those in Lerwick, but only a little.

The object of greatest interest in Kirkwall is the Cathedral of St. Magnus, which dates from the 12th century, and is still entire and in an excellent state of preservation. In the 16th century it was extended both towards the east and towards the west, the same material being used as in the original structure—namely, old red sandstone, which abounds in the islands. Haco, King of Norway, who died in the adjoining Bishop's Palace in 1263, was buried here, as was also Margaret, the Maid of Norway, who died here on her way to Scotland in 1290. One of the finest features of the cathedral is the western doorway, in which there are the remains of some very fine carving much effaced by atmospheric action. A striking effect is produced by alternating yellow with red sandstone in the pillars and mouldings. The interior is bold and plain. The eastern, or "rose" window is very fine, and so is that in the south transept. A fund exists for the maintenance and repair of the fabric; but it might surely be used to better effect than in whitewashing the stone ceiling and in painting the walls of the choir. The chancel is partitioned off by an ugly wooden screen and is fitted up as a parish-church, with box-pews on the floor and projecting galleries between the pillars. The general effect is simply hideous, and the whole of the ugly excrescence should be cleared off with the least possible delay. There is here a good opportunity for some patriotic Orcadian, animated by the spirit of Dr. William Chambers, to do a real service to his land and people. Let him do for St. Magnus what Dr. Chambers has done and is doing for St. Giles's, Edinburgh, and all men of taste will rest his debtors. A number of curious tombstones found in different parts of the building are now ranged along the walls of the aisles. From the top of the great tower there is a magnificent view of Kirkwall, Kirkwall Bay, and the surrounding islands.

Close to the cathedral are two interesting ruins —that of the Bishop's Palace and that of the Earl's Palace. In the Bishop's Palace, or in the building which afterwards received that name, probably from its having been enlarged by Bishop Reid in 1540, King Haco resided after his defeat at the Battle of Largs, and there he died. Its most striking feature is a massive round tower, built of rough stone and crowned with an irregular conical roof. A little to the east of the Bishop's Palace is the still more interesting ruin of the Earl's Palace, which forms three sides of a square, and contains some striking architectural features in corner turrets and projecting round windows. The palace was built by the same notorious Earl Patrick who erected the castle at Scalloway, in Shetland, and who gratified his unquestionably fine taste by oppressing his people and compelling them to furnish both the labour and the materials for his mansions in different parts of his earldom. The great banqueting-hall, the splendid proportions and mural decorations of which may still be traced, forms the central feature of the ruin, as it doubtless did of the castle in its perfect state. Both in the interior of the hall and in the towers and turrets there is a wealth of ornamentation which is unusual in old Scottish houses. There is a fine Gothic window at the south end of the hall, and on the western side there is in the chimney-place as good a specimen of the level arch as can be seen anywhere in Scotland. Of course, the level arch is merely an architectural trick; it is simply an arch, the stones of which are continued downwards till they reach a horizontal line; but the contrivance is ingenious, and there could not be a better model from which to study its peculiarities. The Orcadians deserve credit for the pride which they take in these relics and for the care with which they are preserved.

Another ruin—that of the King's Castle—used to stand to the north-west of the Cathedral. It was in its day the strongest fortress in the northern isles; but as its possessors used their power to the detriment of the lieges, it was in 1614 demolished by order of the Privy Council. In the following century the stones of the castle were used in building a town-house and gaol: and in 1865 the last remaining fragment of the ruin was removed to make way for local improvements. Some good specimens of the old Scottish family mansion, with an interior courtyard, to which access is obtained through a massive stone gateway, may still be seen in the principal street of Kirkwall; but the number of them is being rapidly reduced.

There are many points of interest in the neighbourhood of Kirkwall to which visits may be paid. There is Cromwell's Fort, on the east side of the harbour, built by some of the Protector's soldiers who visited the island in 1650, in consequence of a rising there under Viscount Montrose—the last in which that ill-starred Jacobite took part. There is the Gallowhill, a hill south of the town on which witches were used to be treated with the extreme penalty of the law, and there is Wideford Hill, two miles to the north-west, an eminence 720ft. high, from which one of the most extensive and most varied views in the Orkneys may be obtained. A green mound seen over the brow of the hill toward the north-west is what is popularly called a Pict's house, though whether it was the house of a Pict or a dwelling-place at all, is a moot point on which it is well not to express a dogmatic opinion. The circumference of this mound measures 140ft., and it is 12ft. in height. It contains four separate chambers, to which access is obtained by a passage hardly 2ft. high. The chambers, of which the largest and central one is about 9ft. high, are built of stone, covered with earth and turf. When this mound was opened some years ago there were found amid the rubbish which it contained bones and teeth of the horse, the ox, the sheep, the deer, and the bear; but there were no human remains. There are two other and similar tumuli in the neighbourhood of Kirkwall; but the most perfect and most famous and interesting specimen of the class is that called Mesehowe, near Stennis.

AN IMPROVED DISTEMPER.

AN improved kind of distemper for coating walls and other surfaces has been recently patented by Mr. F. W. Ingram, of 113, Finborough-road, S.W. The invention consists in the use of tapioca flour or some similar farinaceous substance of a glutinous nature as a substitute for size in the preparation of distemper, and it is prepared in the following form:—For white the ingredients consist of a mixture of whiting in powder, tapioca flour, or some similar farinaceous substance, and ultramarine blue in powder, and in about the following proportions, say:—One hundred-weight powdered whiting, four pounds tapioca flour, one quarter of a pound ultramarine blue. This may be varied by omitting the ultramarine blue and substituting other stainers according to the colour required. The mixture only requires the addition of boiling water to render it fit for use. The advantages of this invention are, that it renders the separate treatment of size or glue as a substitute unnecessary; that it is more convenient in form, and that it retains its effective properties for a length of time in any climate, whereas the difficulty of keeping size has always been a drawback to its use, and has in many parts led to the substitution of glue, which also requires separate treatment, and is equally inconvenient to prepare.

MODERN ARTISTIC FURNITURE.

MESSRS. W. WALKER and SONS, of 119, Bunhill-row, E.C., have just issued an illustrated catalogue of their designs of manufactured furniture, which are superior in many respects to ordinary work. Although we have little faith in illustrations of furniture, however well executed, they yet serve to indicate the class of work turned out. In the 20 sheets of illustrations Messrs. Walker give, printed in brown, we have a variety of designs for domestic furniture, beginning with the fittings of the hall, such as umbrella-stands, and ending in the requisites of the bedroom and boudoir. The first illustration shows a dining-room fitted up with Queen Anne furniture, as exhibited by this firm at the Sydney International Exhibition, 1880, and which won a gold medal and first special prize for excellence of design and construction. The buffet and overmantel are, perhaps, rather Renaissance than Queen Anne, but are of good shape. Another sheet shows a carved wood chimney-piece in American walnut, panelled dado and door, panelled wooden ceiling, and parquet floor in hard woods. The first article is priced at £32 10s., and is effective in design. The designs for economic art library furniture are not all of equal merit: the cut ends of the chimney-piece and bookcase are over-worked, and plainer outlines would have been in better taste. The chairs and tables are preferable. Wood chimney-pieces in walnut, oak, and ebonised woods are given in variety, so that the most moderate taste may be gratified. Dining-room furniture, from the plainest to the more costly descriptions, is illustrated in several sheets; the cost of a small dining-room or bachelor's chamber, fitted with oak or American walnut, is quoted in one sheet at £47 10s.; this includes a 5ft. buffet, an overmantel with bevelled glass, a small dining-table, of expanding construction, a side table, 4 chairs, with seats covered in embossed Utrecht velvet, and 2 arm-chairs. Some sensible dining-room sofas and easy-chairs are illustrated, and sheet 11 shows a quietly-designed drawing-room suite, suitable for American walnut or ebonised wood. We also recommend for simplicity and lightness the economic bedroom furniture shown on plate 16, made of ash or walnut. Some of the other designs lose in effect by overcrowding, and a few of the details are wanting in quietness, as, for instance, the ends of the Duchess toilet-table, plate 19. The catalogue will be found useful by all who wish to furnish with good taste and economy. The designs are chiefly in the Queen Anne and Georgian styles.

FRENCH ART AND ITS RELATIONS WITH THE STATE.

THE Lecture Session of the Birmingham and Midland Institute was commenced on Monday, when Mrs. Mark Pattison lectured on "The Relations between Art and State created in France by Richelieu." The lecturer said that, varying with the temper of nations and the condition of the times, painting and sculpture had been seen now under one and now under another of three different aspects. They had been purely imitative, or decorative, or poetic, as one or the other phase answered best to the needs and tendencies of the moment; but it was reserved for one of the rulers of France, as late as the seventeenth century, fully to realise their immense importance in connection with the well-being of a commercial nation. The policy pursued by Colbert in this respect derived its impulses directly from the State policy inaugurated by his great predecessor Richelieu; and in order to understand the relations between the State and the Arts which were created in France by Colbert it was necessary to review the circumstances which led Richelieu into the arbitrary courses which he invigorated with his splendid talent, and which were alternately the object of extravagant blame or extravagant admiration, because the conditions under which he had to work were so little understood. When the reign of Henry IV. came to its fatal close, men, weary of combat, were eager to barter liberty for law. The ideal which had involved the liberation of human life from all the restraints which prevented its harmonious development was replaced by the vision of order. The love of order was the passion of the day, and in the name of order all tyranny was justified. The work of establishing this tyranny fell to the lot of Richelieu. Richelieu was deeply imbued with the importance of truths diametrically opposite to those embodied in the Renaissance. The latter had proclaimed that the most noble fruits of life were produced only when complete scope was allowed to the development of the individual, but Richelieu remembered that the individual counted for very little in the development of a people. The affirmation of the supreme rights of the individual, having been carried to its extreme, had ended in reaction. The day had not yet come for asking in what way individual liberty might be secured, whilst at the same time there should be created in the mass that unity of purpose which alone ensured collective action and led to national greatness. The task of the hour was only the simple task of creating that unity of purpose and of realising that ideal of collective action. To this task Richelieu devoted the most splendid energies which ever inspired a suffering human body, and that which he set himself to do he accomplished. The lecturer briefly traced the course pursued by Richelieu in welding all the forces of the national life into one giant whole, and pointed out that his policy should be judged by the circumstances of the hour, and not by the standard of fixed principles. The principles of his policy imposed themselves on after-generations, and although the royal power which was put in his hands became a scourge to those who followed him, yet its utmost excesses could not destroy the bond into which he had knitted the very nerves and sinews of France. The lecturer pointed out how Richelieu's policy of union, direction, and protection was left to those who came after him; and went on to show how his successor, Colbert, carried out these principles in relation to the Fine Arts. An interesting description was given of the manner in which the new Academy of Paris, under Governmental regulation, superseded the ancient *maîtrise*, or corporation of painters and sculptors. Colbert had no more love of the arts for their own sake than any other leading man of his day, but he saw the services which they might render to industry, and the welfare of French industry was a point of supreme importance in his general scheme of maintaining the predominance of France over the rest of Europe. To the Academy was now confided the future of French art, and to it was wholly entrusted the education of the young generation, while to the chief of the academicians was allotted, not only the direction of the Academy itself, but also that of all the branches of French industry in so far as they demanded the co-poration of art. As controller of the Royal household and of all works undertaken by the Crown, Colbert found additional reasons for upholding and securing the position of the Academy. He was now free to organise as he would all the various forms of art activity throughout the kingdom, to connect them with one another, and place their direction in one absolutely guiding hand. Henceforth one and the same system should embrace in its meshes the administration of public works, of the Royal galleries and collections of all art industrial enterprises—should connect and constitute all art bodies, direct the teaching in their schools, and control even the arrangements of their annual exhibitions. This system, which involved a code of the most arbitrary measures, was brought into organic unity by the single purpose of enhancing French social and political importance. To this end Colbert fostered French industry, and forced it into novel channels, bringing glassworkers from Venice and lacemakers from Flanders, that they might yield to France the secret of their skill; and to this end he provided for the French artisan means of instruction such as he had never before enjoyed. The art treasures of the King were lavishly increased, not for his private pleasure, but that they might be the more useful in refining the taste of those to whom they were to be thrown open; palaces and public buildings were to afford commissions to French artists, and a means of technical and artistic education to all those employed upon them. An establishment created for the making of the necessary furniture of State apartments became at once a great national school of cabinet-making and upholstery, which, coupled with the training received in the State manufactories of Gobelins and Sèvres, immediately influenced every branch of production, whilst the officially organised corporations of artists which spread themselves over the country under the protectorate of the central Academy of Paris, and the facilities afforded for foreign study by the foundation of the School of France at Rome, secured the interests of art education in its highest and most complete form. With Le Brun as director of the Academy, that unity of authority which had been the precept of Richelieu's policy imposed its extreme consequences, and prevented in France that divorce between art and industry which took place at that moment in almost every other country in Europe. Although the caprices of the power which Richelieu's and Colbert's principles had rendered sovereign ultimately brought about financial distress through foreign wars; and although many parts of Colbert's scheme fell to the ground, the spirit in which it originated still animated France. His great provincial school of industrial art at Bièvre-Vache was suppressed, but the principles upon which that establishment was conducted still prevailed in the great national manufactories, and the workmen of the Gobelins and Sèvres went forth, like their forefathers from Bièvre-Vache, to enrich the resources and raise the level of private enterprise. The autocratic tyranny of Le Brun still bore fruit, for the conditions created under his auspices preserved sound traditions of teaching and training ready to hand against the day when the sources of artistic production might again prove fertile; and in spite of wars and revolutions, the connection between the arts and industry—which other nations were now seeking painfully to re-establish—had never been lost in France. French provincial cities still maintained their academic schools, and they might even now see the municipal councils of poor country towns taxing their slender funds with noble public spirit to give the boy whom they hoped might one day distinguish himself a start on his way to Paris. The lecture was listened to with attention and appreciation; and at its close a hearty vote of thanks was passed to the lecturer.

DECORATION OF ST. PANCRAS' CHURCH.

DURING the last two months this well-known church has been in the hands of Messrs. Cracc. It was opened for service on Sunday last. An important change has been effected in the aspect of the interior, which, with its walls of Pompeian red no longer produces that gloomy impression which it before shared with many of its "classic" sister churches in London. A building with a flat ceiling 117ft. long by 60ft. broad, and only 40ft. high, may be said to present distinct difficulties to the decorator; but these have been boldly met, and not without success. The ceiling in question is originally divided by very wide margins into a great number of very small panels or shallow coffers, containing at intervals pendant rosettes. The margins are kept light, of a quiet stone-tint, and the panels mostly blue with a green star in each, only those being coloured red which emphasize the general design. The proportions of the panels are improved by carrying the blue or red somewhat beyond their own limit. The cornice, which has the demerit of consisting of a great number of small mouldings without any frieze or leading feature, has been well brought out with firm colour and pretty solid gilding. The walls above the galleries are painted a bright luminous red, whilst below the galleries so much of the wall as is not occupied by the numerous marble tablets is of a darker tone; the window and door dressings throughout being kept light. The gallery fronts are also light, with bronze and gold mouldings, and are divided by ornaments into spaces which accord with the columniation below them. The dwarf columns which support the galleries are also treated as bronze, and relieved with gilding. The apse, or "tribune" (which already contained three good but somewhat dark stained windows) is now made rich and effective by a series of wide horizontal bands of fine Greek ornament on gold ground, which well relieve the six heavy wood antique scagliola columns. These columns are said to be the largest ever made in scagliola, and will be remembered by those who know St. Pancras as the leading feature of the interior.

The topmost of these gold bands bears the words, from Isaiah, "Come ye and let us walk in the light of the Eternal." The high plinth below the columns is decorated principally in a rich maroon colour and gold ornament, which is made to connect and frame the white marble tables of the decalogue, prayer and creed which already existed. The oak seating remains and has been renovated. New warming apparatus on Grundy's system has been introduced, and under the supervision of Mr. Salter, architect, the surveyor of the fabric, other general repairs have been executed. The cost of the works has been undertaken by a committee of the congregation, who have relied entirely upon private subscription. The church was designed by Inwood and built in 1820-22 at a cost of £76,000. The renovation will cost over £2,000. The Rev. the Hon. Canon Spence is the present vicar, who has actively promoted the work.

STAIRS.

STAIRS (writes a contributor to the *American Architect*) can be made an attractive feature in a house. Every architect knows this; but no man can build a flight that will be comfortable, or even safe, in a cramped or narrow hall. Stairs are exacting in their demands, and if these demands are not complied with we shall be reminded of the neglect every time we use them. We may resort to make-shifts (if inclined to do so) in other parts of the house, but we cannot put off the stairs with anything and say "it will do," and no coaxing will bring an ill-contrived or badly-arranged flight of stairs into use on any possible terms. A good run is what every flight of stairs requires. If the run is not long enough, then we must increase the height of the risers; and the rise, after it has reached a certain point, becomes trying when difficult, and at last dangerous. In many houses, in almost all cheap houses, the rise is eight inches. Even the back stairs should not have a more rapid rise, and for the principal stairs this is wholly inadmissible. The other extreme, a fault not often committed, is to have the rise too low. Anything below six inches is almost as trying as the other extreme, but it is not so dangerous. The most satisfactory rise is six and a-half inches, and from that, if crowded, we may go on to seven inches without drawing attention to the tread; but above that point the rise begins to fatigue us. A rise of six and a-half inches requires a tread of at least fourteen inches, and for one of nine inches a tread of eight inches will suffice. But I cannot believe that any one would put a rise of that height into any dwelling. One might as well resort to a ladder, and indeed, a rise of this kind would be but little better than such a contrivance to reach the chamber floor. Whether the risers are high or low, they must all be of a uniform height. Any departure from this rule is always attended with mischievous results. If all the risers in a flight are seven inches, with one exception, and that one is either six or eight inches high, every person who passes up or down will trip at that stair. No matter how often he goes up or down, he will always trip at that point.

Stairs, to be effective, should be wide between the wall and rail, with one or two flats or landings; and in no instance should they be disfigured by the introduction of winders. The rail must be heavy, the balusters something more than "dipper handles," and at the foot let there be a newel, on which the architect may display his taste and skill. It need not be elaborate, but it is a conspicuous object, and it should have something more to recommend it to our notice than the cheap and stereotyped forms, which may be bought at the turner's by the hundred.

It is pleasant to mount up stairs properly planned, especially if they are well-lighted and ventilated. And if on the first landing the architect can contrive a bay, deeply recessed and provided with seats beneath the wide windows, he will, by so doing, add another charm to the house. Here those who are advanced in years, and who find it difficult to climb the whole flight at a time, may rest awhile, or sit and chat. Here the little ones love to pause in their passage up and down, and here flowers growing in a *jardinière* in front of the window, may send their fragrance through the house.

"GLOUCESTERSHIRE NOTES AND QUERIES."*

THE last part of "Gloucestershire Notes and Queries" quite equals its predecessors in the variety of matter. We have a very interesting transcript from the late Sir Gilbert Scott's "Personal and Professional Recollections" on Gloucester Cathedral (pp. 336, 339), in which the restoration and decoration of the choir-vaulting are made the subjects of remark. The polychromatic treatment of the intricate ribbed vaulting of choir is one that would not please everybody, but our own recollection of it disposes us to agree with the opinion of the late eminent restorer. Another note speaks of the font, a massive design by Scott in the Norman style. The writer says "it harmonises well with the general features of the nave, though not exactly with the architecture of that portion of the building where it is placed, near the moulded columns and west front added by Abbot Morwent in the middle of the 15th century." It is wrought in Inverness granite, which is as hard as steel, and of a mottled red colour, not unlike Lizard marble. It stands on steps "fine axed" of pale blue colour. At the corners are shafts with carved capitals, and the four sides of font have carved panels, 3 to each front, in low relief, surrounded by foliage. These contain heads of St. Mark and St. Luke, the heads of the prophets Jeremiah, Ezekiel, and Daniel, and also St. Matthew, St. John, and Isaiah, with other devices. The carving is said to be exceedingly fine for the material. Its cost was £750. On page 256 is an account of some curious stone figures at Notgrove Church, quoted from Rudder. An ancient freestone figure in the north cross-aisle, in a long robe, and in the churchyard two other similar figures of stone, in full proportion, are described. About the year 1650, so says the tradition, one of these stones was removed and turned into a trough for cattle, "but there was such a lowing and disturbance amongst them the day and night following, as struck the people with terror and amazement, and caused them to bring back the stone to its former place, and then all was quiet again. This was attested by the minister of the parish, and several of his neighbours of good credit, in the year 1680." We find an interesting note on Todenham parish-church, recently restored by Mr. E. J. K. Cutts, of London. Fragments of Norman and an Early English arcade are preserved. The description of Cheltenham 60 years ago, and the quotations from parish registers, will be read with interest by the antiquary, and already the editor, the Rev. B. H. Blacker, M.A., has rescued from dust and neglect many scraps of information from recondite sources, which the future historian of Gloucestershire may turn to good account.

MODERN STEELS AS STRUCTURAL MATERIALS.

AT a meeting of the Society of Engineers, held on Monday evening last, in the Society's hall, Victoria-street, Westminster, Mr. Joseph Bernays, President, in the chair, a paper was read by Mr. W. Worby Beaumont, C.E., on "Modern Steels as Structural Materials." The object of the paper was to call attention to the structural inferiority of the modern very soft steels as compared with the structural value which steel made by the Bessemer and other modern processes promised to possess ten years or so ago. At that time, the high tenacity of steel then being produced seemed to indicate that it would afford engineers considerable facility for building lighter structures than was possible with iron. Attempts to employ this steel for bridge and boiler-work, however, showed that it was necessary to impart greater toughness to these steels, and since then steel-makers have laboured to effect this by producing very soft and ductile steels. The result of this has been that very mild steels of low elastic limit, though of considerable ultimate strength and of great range of extension, have been produced, some of these steels offering very little structural advantage over ordinarily good iron, and some inferior to best iron. In the endeavour to impart toughness to the steels, great ductility had been obtained, which, if necessarily accompanied by a low elastic limit, was a loss in efficiency. It thus appeared that constructors were in danger of losing all the advantages which the application of steel to structural purposes promised a dozen years ago to secure, though steels may now be obtained of greater uniformity and trustworthiness than was possible at that time.

CHIPS.

The Town Council of Bristol decided, on Tuesday week, consequent on a report by Mr. Howard, C.E., to reconstruct the Bedminster-bridge. The existing one is an early iron structure, which has long been reputed to be shaky, and which was described in the course of the discussion as an "engineering curiosity."

The annual report as to the Wesleyan Methodist Extension Fund shows that during the past year ninety-one chapels, providing additional accommodation for 14,507 persons, have been assisted by grants amounting to £7,552. The fund has aided during the past six years in providing 55,855 additional sittings in Wesleyan chapels.

"The Auld Clay Biggin" at Ayr, in which Robert Burns was born, hitherto occupied as a public-house, is about to be transferred to the trustees of the Ayr Burns' Monument, and converted into a sort of Burns' museum. There is a considerable area of ground attached, and this is to be attractively laid out.

A new mission-church of St. Michael and All Angels was opened at Ponsanooth, three miles from Penryu, on Wednesday week. It has wooden mullions and bell turret copied from the picturesque church of Crowfield, near Coddenham, Suffolk. Mr. H. Bennetts, of Pemyn, was the builder.

An inquiry was held at the town-hall, Stratford-by-Bow, on Tuesday week before Mr. S. J. Smith, Inspector to the Local Government Board, respecting an application from the West Ham local board for sanction to borrow £10,000 for works of surface drainage and £6,590 for street improvements. The surveyor to the board, Mr. Lewis Augell, explained the nature of the proposed improvements.

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* London: W. Kent and Co., Paternoster-row.

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ILLUSTRATIONS.

INTERIOR OF THE CHURCH OF ST. MICHAEL, CAMDEN-TOWN.—SIR FRED. LEIGHTON'S HOUSE: THE ARAB HALL.—MAISON HYDRAULIQUE, ANTWERP.—MEMORIAL HALL AND SCHOOLS, DOVER.—PRIVATE HOTEL, ARUNDEL-STREET, STRAND.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CHURCH OF ST. MICHAEL, CAMDEN TOWN.

THIS fine example of church architecture, designed by Messrs. Bodley and Garner, architects, is now in course of erection, and our lithographic illustration is taken from Mr. W. S. Weatherley's beautifully-executed pen-and-ink drawing from the last Royal Academy Exhibition at Burlington House. The foundation-stone of this church was laid about three months ago by the Marquis of Camden.

ARTISTS' HOMES.—NO. 7: THE ARAB HALL, SIR FREDK. LEIGHTON'S HOUSE.

LAST week we fully described this interesting house, at the same time giving plans, elevations, and a general perspective view. To-day our double-page plate illustrates the elaborate interior decorations of the Arab Hall. The dome is decorated on a gilt ground, and the windows are glazed with stained glass. The small shafts to the side-openings are entirely of white marble, and the caps to the large columns on either side of the entrance are gilt. The wall-tiles to the window-reveals are dark blue. In other respects, the black-and-white drawing furnishes as fairly a good idea of the decorative effect as any drawing of the kind, simply in line, can give. Mr. George Aitchison, B.A., was the architect for the work. The marble-work was by Messrs. White and Sons, of Vauxhall Bridge-road, Pimlico. The drawings from which our illustration is taken were exhibited this year at the Royal Academy.

MAISON HYDRAULIQUE, ANTWERP.

ONE of our lithographic pages is devoted to some useful details from the Maison Hydraulique at Antwerp. The sketches were made on the spot by Mr. J. Alfred Gotch, who has furnished many very valuable particulars on the drawing itself with several figured dimensions. The sheet includes drawings of the staircase, with its remarkably-carved balustrade; an old oak bench; some fireclay tiles and glazed tile linings to an open hearth; and details of a hanging lamp in iron.

MEMORIAL HALL AND SCHOOLS, DOVER.

THIS building is situate, with the main entrance in Priory-road, having a right of entrance also in Biggin-street. It has been erected for the requirements of a congregation gathered together by the labours of the Rev. J. F. Frewin. The great peculiarity of the site—a narrow frontage of about 20ft., widening out behind, and again narrowing to a mere slip—rendered special planning necessary. The difficulty was further increased by the circumscribed area, necessitating the covering of every inch of available ground to obtain the required accommodation. The hall, being surrounded by adjoining buildings and property, the light had to be obtained, almost entirely, from the roof. The front building is devoted to class-rooms, &c., for the purposes of a Sunday-school. The front is built of red brick, with Bath stone dressings; the roofs are slated with Bangor slates. The Hall is heated on Porritt's system of an underground stove. Provision is made for a gallery at end, and one at side, to be erected at a future time. The cost of the buildings, including fittings, is slightly under £2,000. The works have been very satisfactorily carried out by Mr. W. Bromley, builder, of Dover, under the superintendence of Mr. A. T. Taylor, A.R.I.B.A., architect, of Moorgate Chambers, 72, Finsbury Pavement, E.C. The illustration is a reproduction of a drawing in this year's Royal Academy.

PRIVATE HOTEL, ARUNDEL-STREET.

WE publish an elevation of the above hotel, which is about to be erected upon the sites of Nos. 25 and 26, Arundel-street. It will be of red brick, stone dressings, and tiled roof. It will contain over 40 bed-rooms for visitors, and will be fitted with every modern convenience. A lift will communicate with each floor. The architect is Mr. J. Dunn, 1, John-street, Pall-mall, S.W.

COMPETITIONS.

CARDIFF.—Plans are invited for the erection of a public hall on the site of the old Theatre, Crockherbtown. The street frontage is 100ft.; sitting accommodation must be provided for 2,000 persons, with an orchestra for 200 persons, and the limit of cost is £10,000. A premium of £100 is offered for the best plan, and designs are to be sent in before January 3rd, 1881.

LIVERPOOL.—NEW CONSERVATIVE CLUB.—On Wednesday, September 29th, the date fixed for the delivery of the plans by the competitors, twenty-seven sets of plans were sent in to the committee. It is believed that they intend to hire a suitable set of rooms near the Exchange for the exhibition of the drawings; after which no doubt Mr. Alfred Waterhouse, who drew up the conditions, will inspect the drawings, and make his report for the final consideration of the committee.

SCHOOLS OF ART.

AYR.—The annual distribution of prizes to successful students in the science and art classes was made by Col. Alexander, M.P., at the New Academy, Ayr, on Saturday. The report showed that in the art classes 13 students earned the highest grant for works sent to South Kensington, 5 third-grade, and 11 second-grade prizes had been taken. At the May examinations, 16 prizes and 51 passes were gained in the second-grade—in all, 28 prizes falling to the art classes. The science classes had also been satisfactory, and in building-construction 5 passed—2 first-class and 3 second—and a similar result was attained in the applied-mechanics class.

GATESHEAD.—A meeting was held on Monday week in the Town-hall, Gateshead, for the purpose of presenting the prizes to the successful students who last winter attended the Science and Art Classes of the Gateshead School Board. The meeting was addressed by Professor Ede and others. The following were the prizes and certificates awarded:—Barn Close Schools: Students registered, 104; examined, 87; Queen's prizes won, 26; certificates taken, 82. Alexandra-road Schools: Students registered, 57; examined, 43; Queen's prizes won, 18; certificates taken, 78. North-Eastern Railway Literary Institute: Students registered, 29; examined, 17; Queen's prizes won, 6; certificates taken, 21. Prior-street Schools: Students registered, 16; examined, 12; Queen's prizes won, 3; certificates taken, 10.

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A new private chapel at Wynyard Park, the residence of the Marquis of Londonderry, was consecrated by the Bishop of Durham on Sunday. The chapel has been built at a cost of between £4,000 and £5,000. Mr. James Brooks, of Wellington-street, London, W.C., was the architect, and Mr. Sanderson, of Durham, the sole contractor.

ARCHÆOLOGICAL.

INTERESTING ARCHÆOLOGICAL DISCOVERIES AT KIRKDALE CHURCH.—A short time ago the authorities of the University of Oxford, as rectors and patrons of the living of Kirkdale, North Yorkshire, commenced to restore the chancel of the ancient Saxon church at that place, one of the oldest and most interesting ecclesiastical buildings in the country. It was intended to put a new roof on the chancel, and to make several other improvements, which we detailed about a month ago. Since then the work has been commenced, but the walls have proved to be so decayed and unstable as to be quite incapable of sustaining the weight of the oaken roof intended for the chancel. Consequently more extensive alterations and excavations have been found necessary, and in the progress of this additional work some very curious specimens of sepulchral work have been discovered. Under the wall-plate on the north side of the chancel was found a stone supposed to indicate the resting place of an archer, as on its surface were distinctly visible the remains of a bow and arrow, whilst at the junction of these two, on what was intended for the string, was seen carving supposed to represent the hand of the archer in the act of pulling the bow. How the stone became fixed where it was found has not yet been satisfactorily explained. A similar stone is said to be visible in Coxwold Church. In the opposite wall of the chancel was found embedded what had evidently been used as a stoup. Another discovery was made by the workmen in the corner of the north-east wall, where they found a curious stone, completely covered with Runic inscriptions. Similar stones have been previously found here, and are now built up into the south and west walls of the church, one of them showing (as translated by the Rev. D. H. Haigh, of Erdington) that it was the tomb of Ethelward, King of Deira, A.D. 651 to 660. Six lead coffins of more modern date have also been disinterred, probably containing the remains of some of the Robinson family, former owners of the Welburn estate, and who lived at Welburn Hall, a fine old Elizabethan mansion now in ruins, about a mile south of Kirkdale Church. These have probably been interred from eighty to one hundred and twenty years.

CHIPS.

The Pontypridd urban sanitary authority received on Friday a report by Mr. Lomas, engineer, explaining his sewerage scheme for that town. He proposes to adopt the quiescent principle, and to construct works in Taff Vale, and to discharge the effluent from the filter-beds into the river.

The death is announced of Mr. Thomas Carline, county surveyor for North Yorkshire, and brother of the surveyor to the Lewisham district board of works.

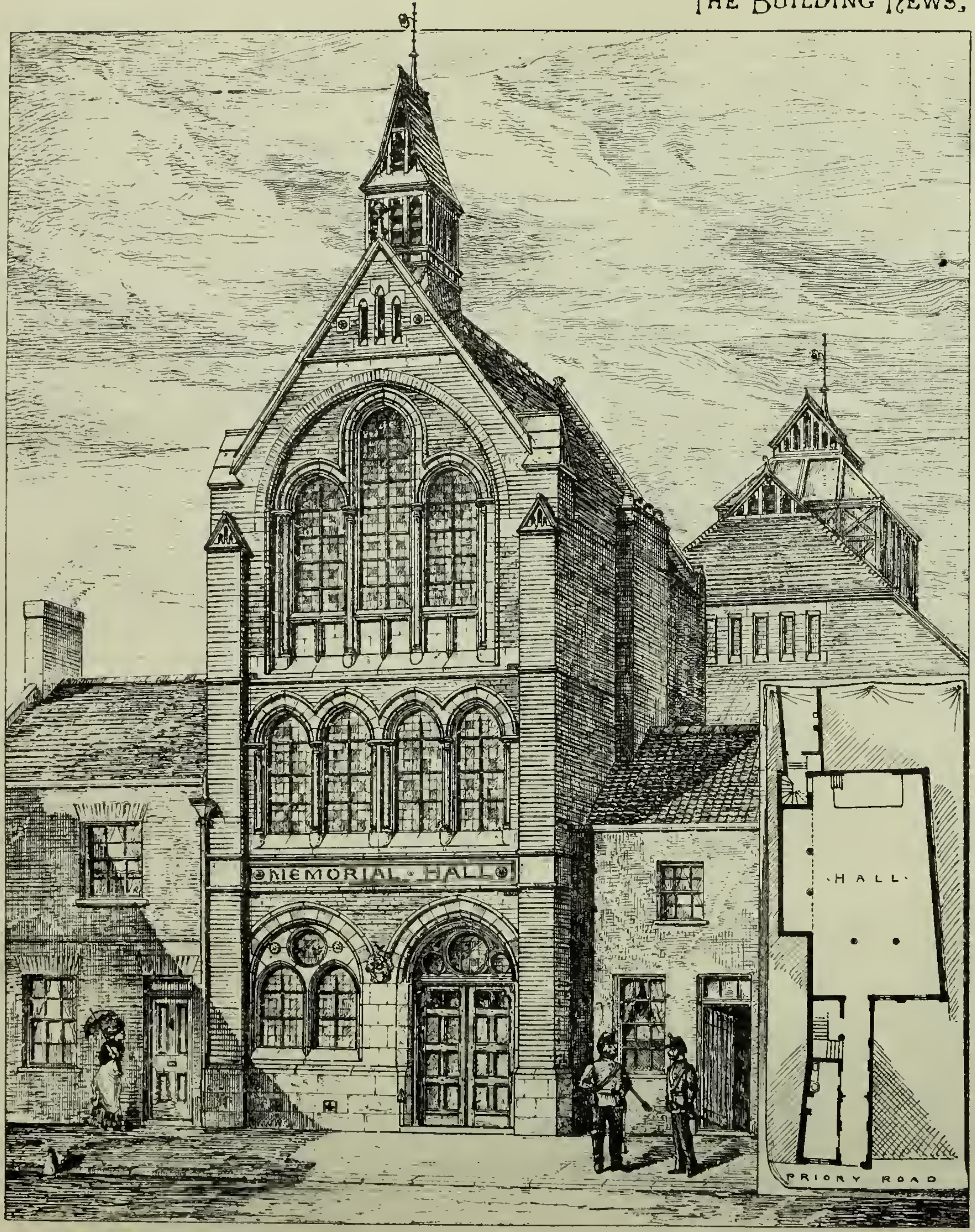
A memorial drinking-fountain is about to be erected in St. Leonard's Public Gardens in commemoration of the late James Burton, architect, and founder of the town of St. Leonard's-on-Sea.

A shocking accident occurred on Sunday, at the Roman Catholic Cathedral Church of St. Aloysius, Ardwick, Manchester. Whilst the congregation of between four and five hundred persons were leaving the upper room, one of the beams running from wall to wall collapsed, and a large portion of the floor gave way, precipitating eighty or a hundred persons into the school-room beneath, a distance of nearly twenty feet. One woman died directly, and twenty other persons were conveyed to the infirmary.

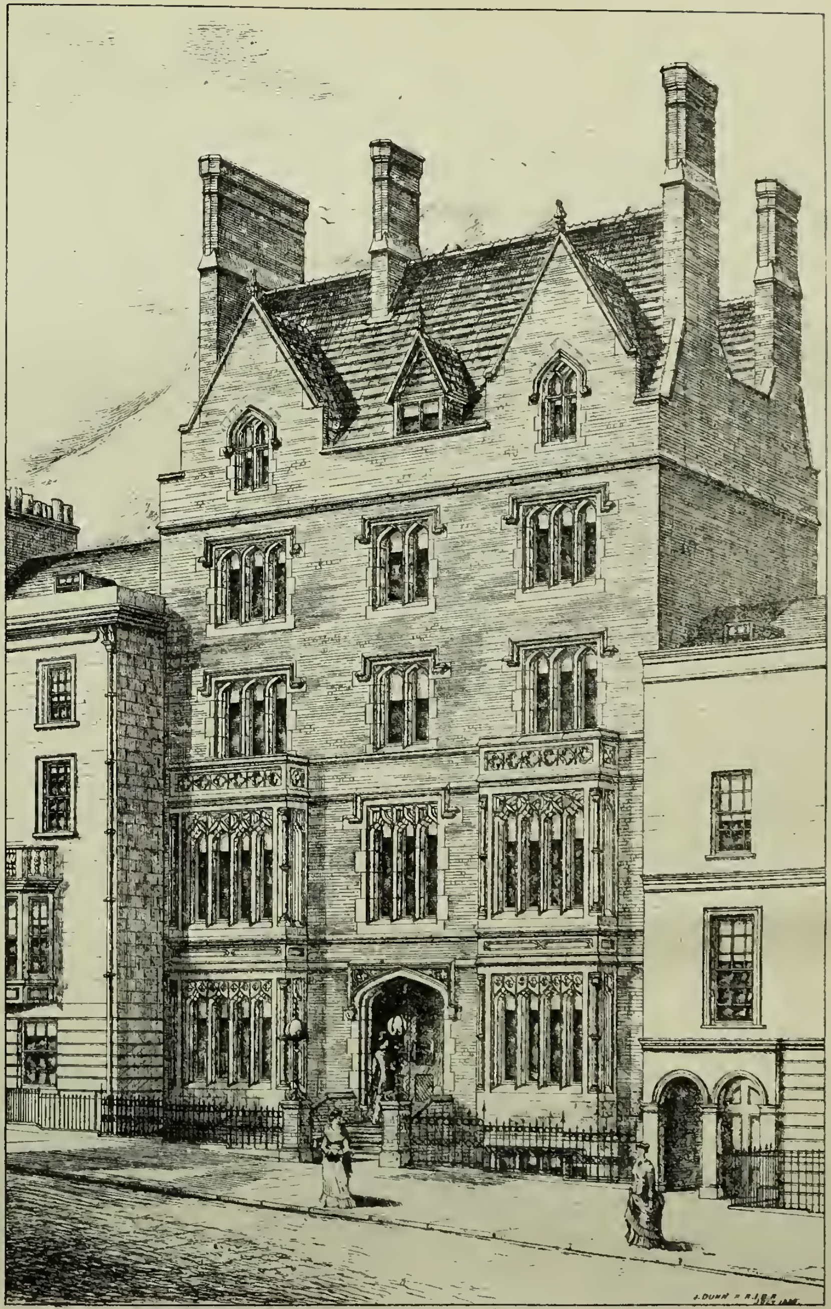
The Church of St. Elizabeth, Ashley, erected at a cost of £3,000, by Lord Egerton of Tatton, from the designs of the Hon. Wilbraham Egerton, M.P., has been opened. It will seat 250 people. This building, with the exception of the belfry, which is of Runcorn stone, is of brick and terra-cotta. The style of the church is Early Decorated. The contractor for the fabric was Mr. H. Ormson, of Bowdon, and for the internal fittings Messrs. Jones and Willis, of London.

The Semper Museum, lately opened in Zurich as a memorial to the great architect, owes its foundation to a committee of his scholars and admirers. Another memorial is being prepared, in the shape of a complete edition of his architectural and other artistic writings, which will be illustrated by 130 copper-plate engravings. His son, Manfred Semper, is charged with the editorship.

A new Roman Catholic Church was opened at Maidstone, on Monday. The contractor for the building was Mr. Naylor, of Rochester.



MEMORIAL HALL AND SCHOOLS DOVER A.T.TAYLOR ARCHITECT.



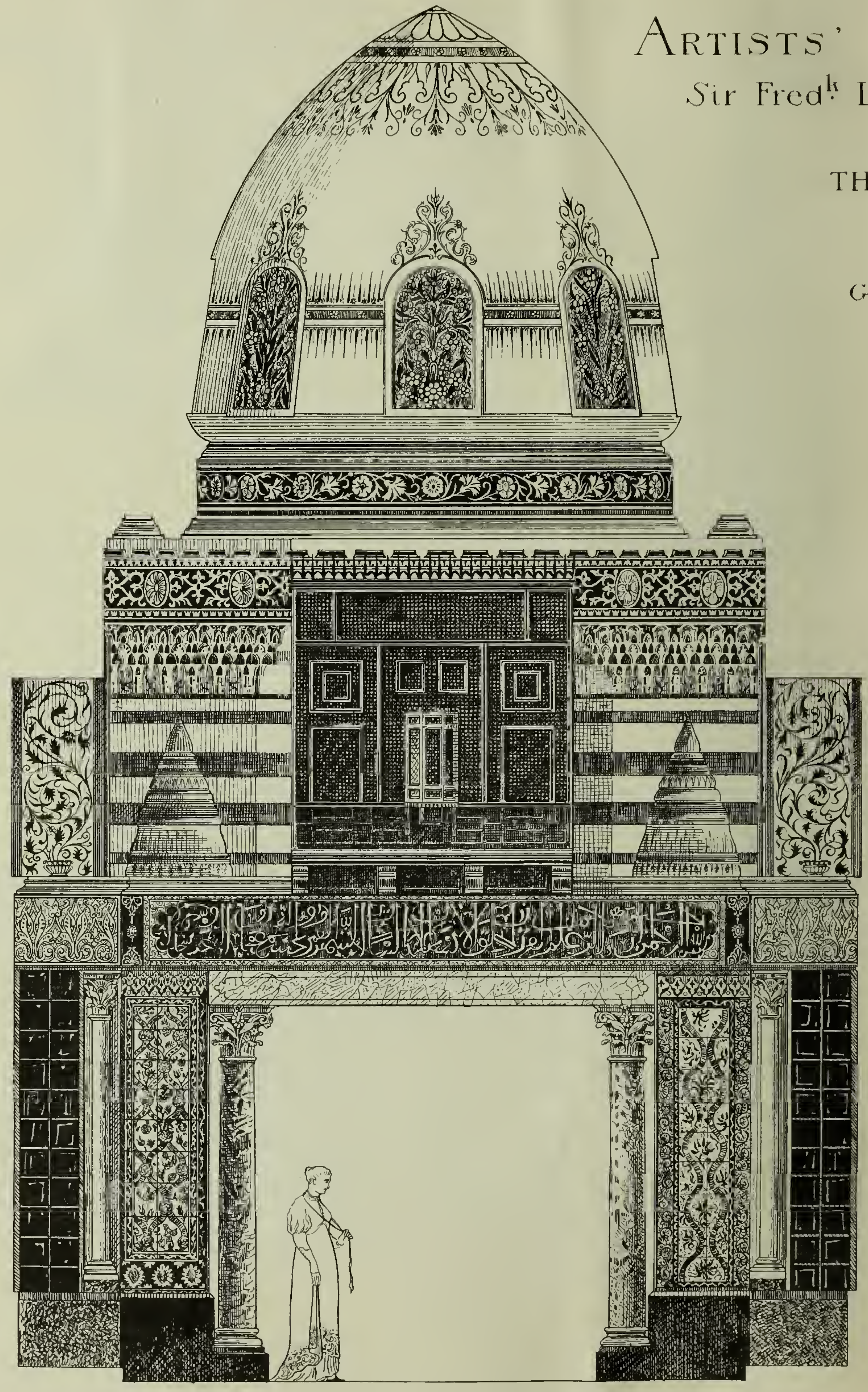
PRIVATE HOTEL - ARUNDEL STREET - STRAND.

ARTISTS' H

Sir Fredk. Leigh

THE AF

George
AR



Sca

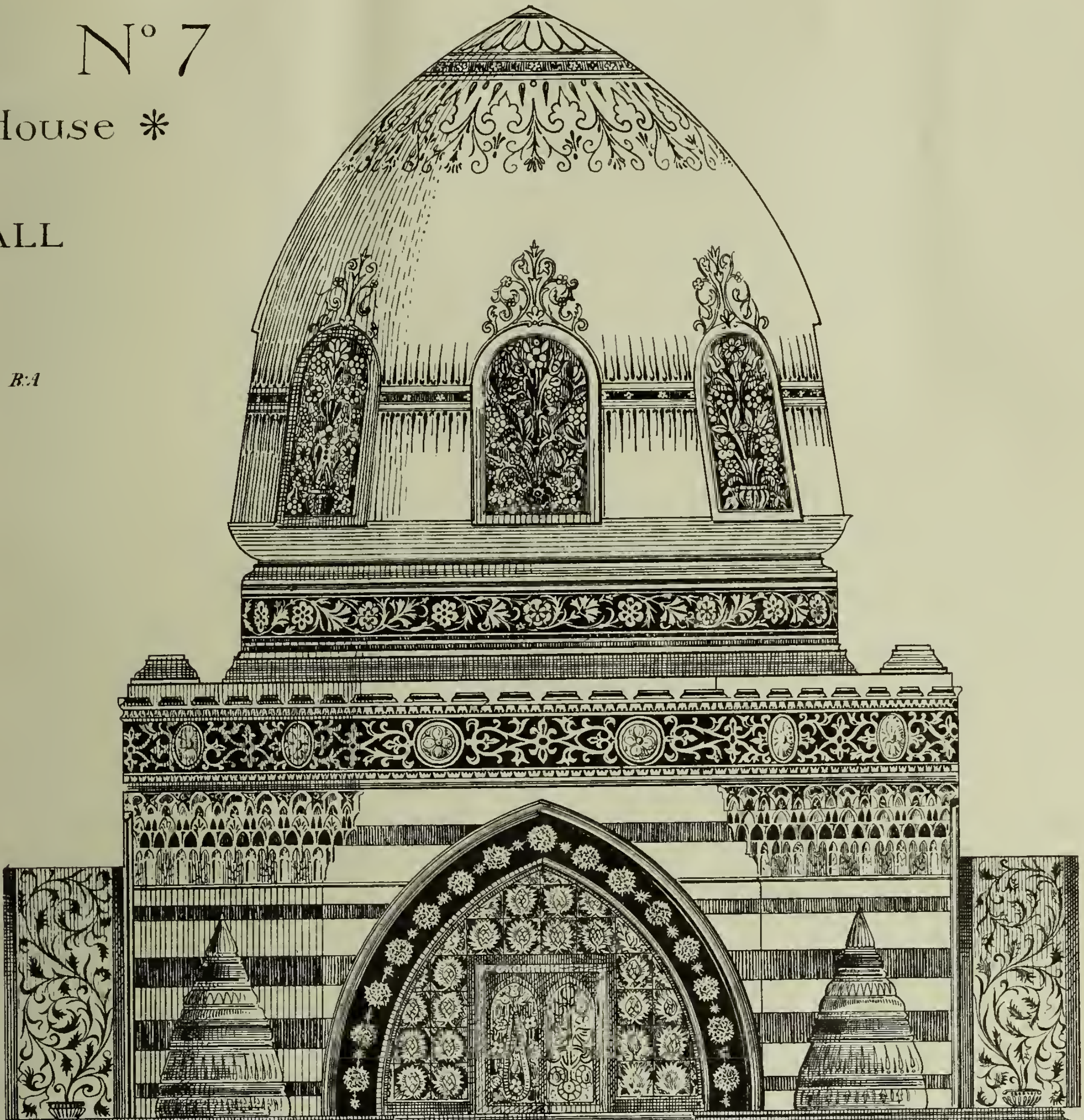
1 2 3 4 5

MAURICE B ADAMS DELT

MES N° 7
n's House *

B HALL

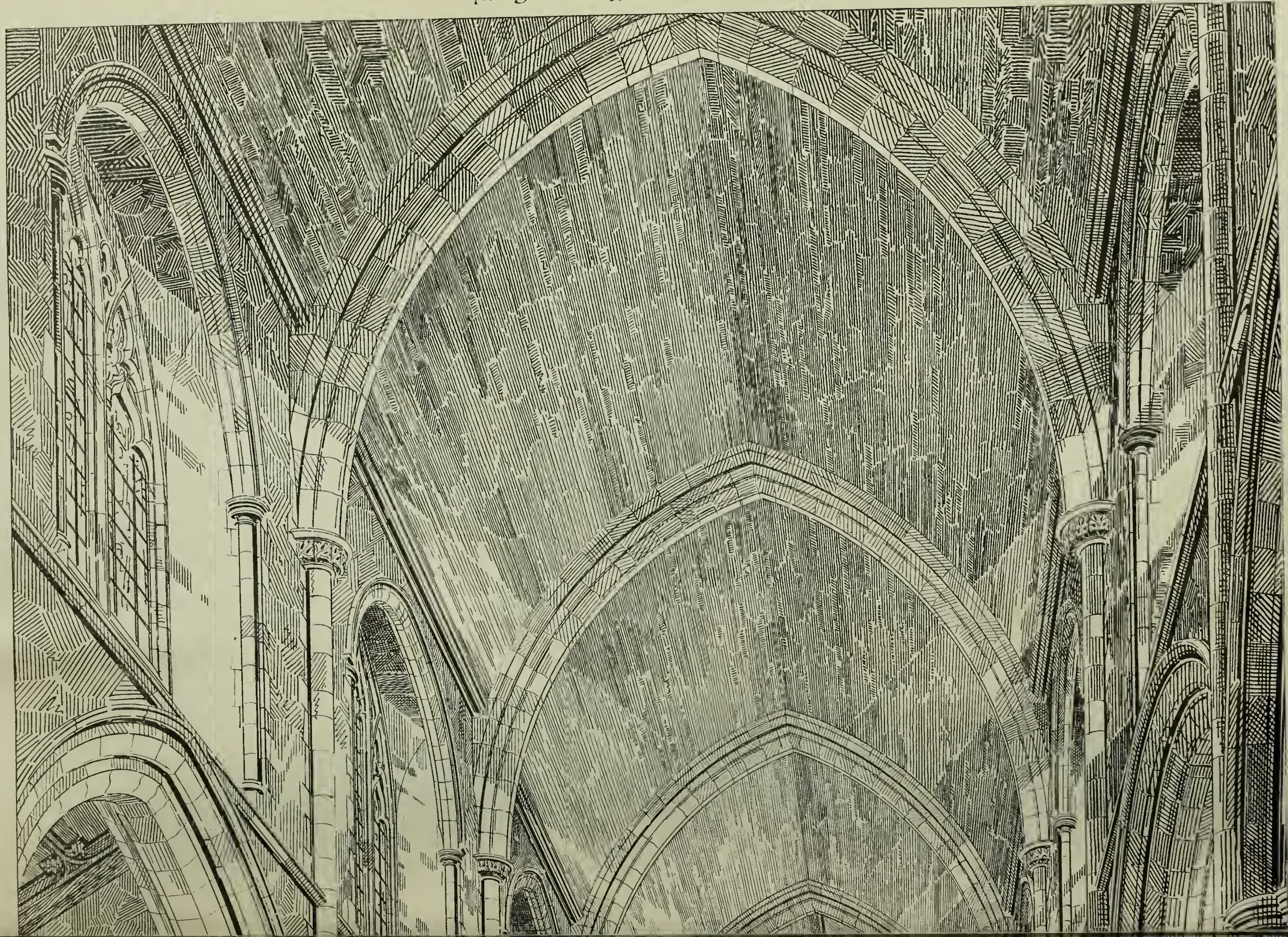
tchison R.A
ITECT



-of-feet

10 15 20

Photo-Lithographed & Printed by James Akerman. 6, Queen Square. W.C



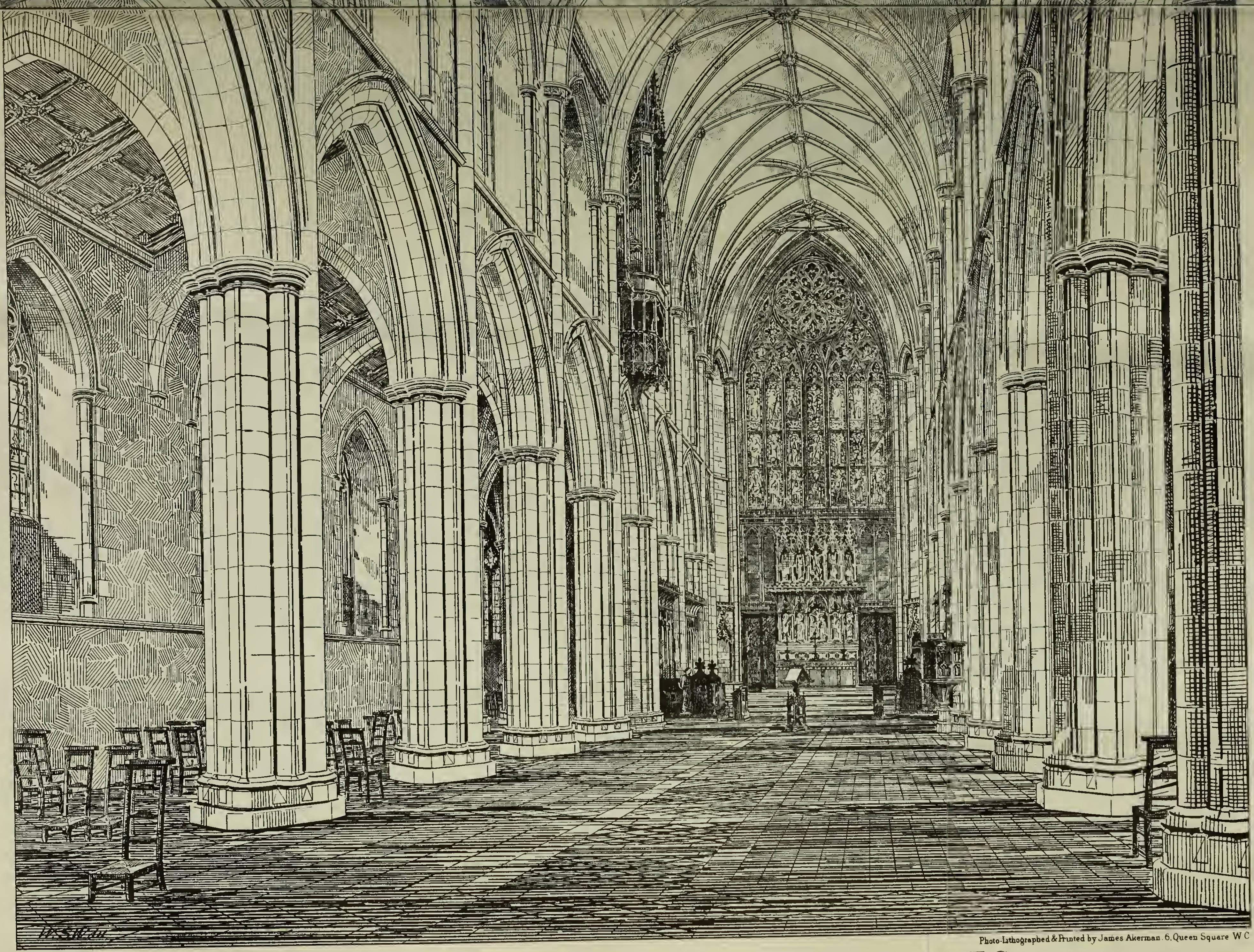
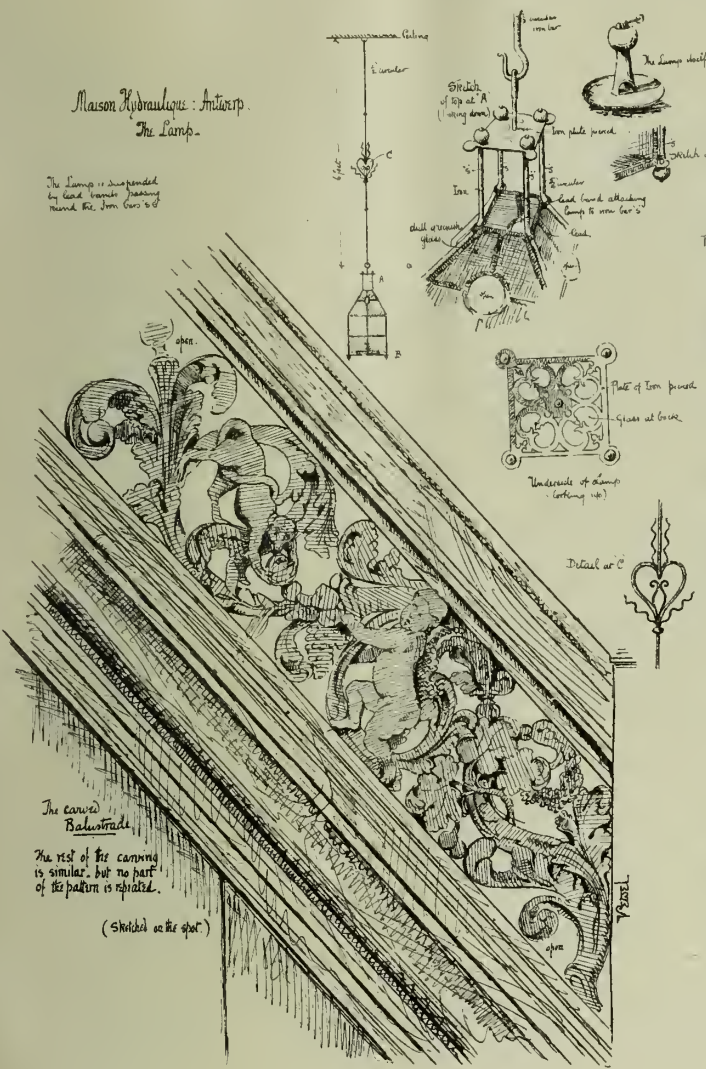


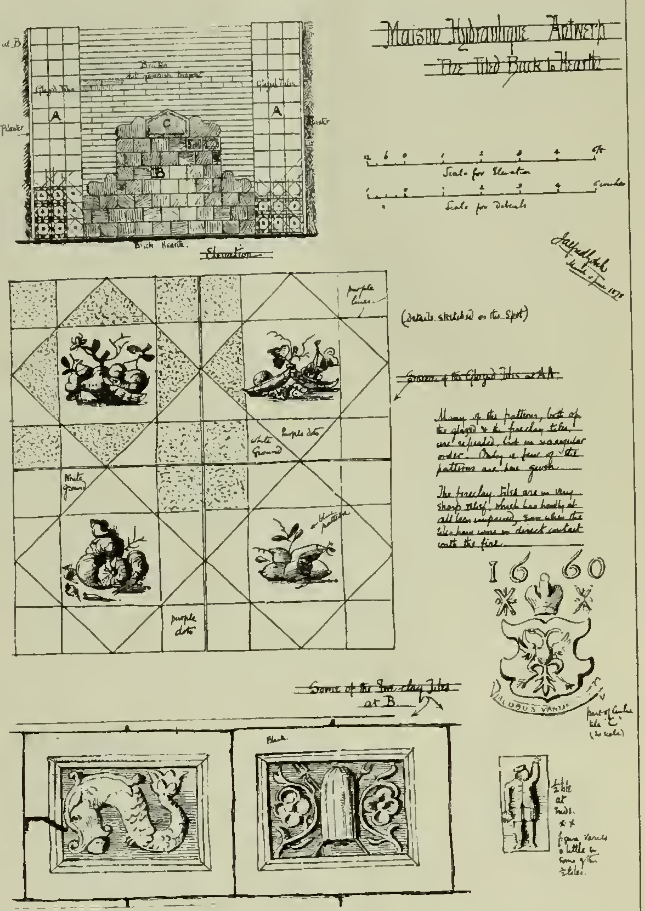
Photo-Lithographed & Printed by James Akerman. 6, Queen Square W C

Interior of the Church of S^tMichael Camden Town · *C·F·Bodley and T·Garner* ARCHITECTS

Maison Hydraulique: Antwerp.
The Lamp.

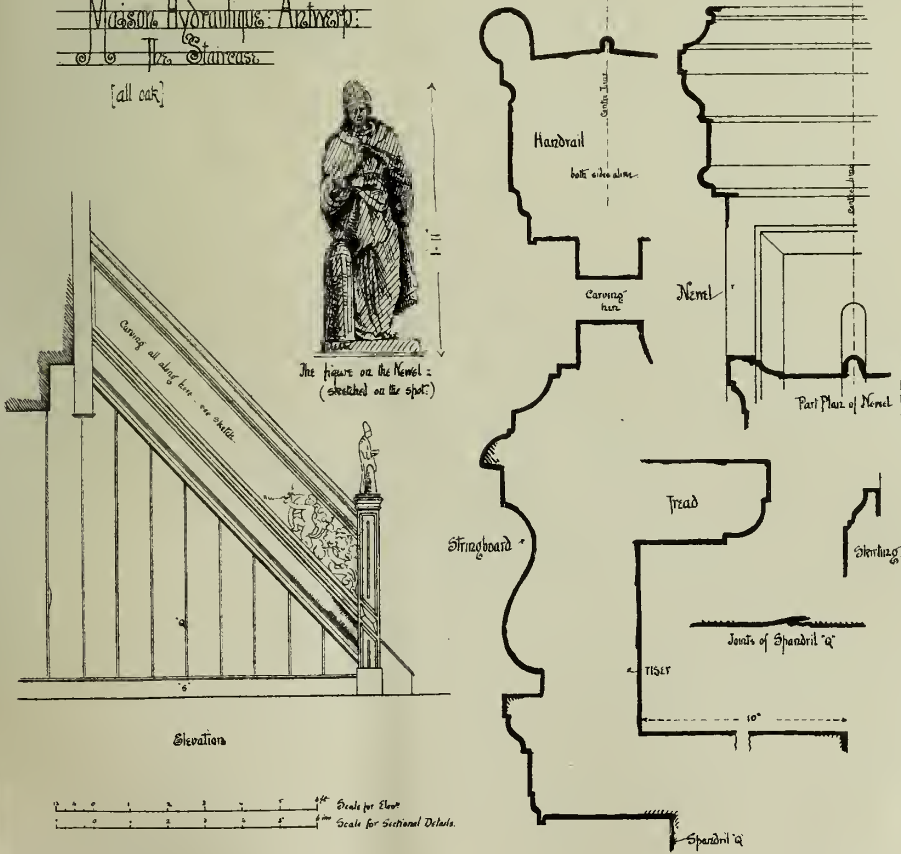

The Lamp is suspended by lead bands passing round the Iron bars 'S'
Ceiling
½ circular
C
6 feet
A
B
Sketch of top at 'A' (looking down)
circular iron bar
The Lamp itself
Iron plate pierced
Sketch at B
'S'
Iron
½ circular
lead band attaching Lamp to iron bar 'S'
dull greenish glass
lead
Plate of Iron pierced
Glass at back
Underside of Lamp (looking up)
Detail at 'C'
open.
open
Newel
The carved Balustrade
The rest of the carving is similar, but no part of the pattern is repeated.
(Sketched on the spot.)

Maison Hydraulique Antwerp
The Tiled Back to Hearth


Bricks dull greenish brown
Glazed Tiles
Glazed Tiles
A
A
C
B
Plaster
Plaster
Brick Hearth.
Elevation
Scale for Elevation
Scale for Details
J. Alfred Gotch March & June 1878
(details sketched on the Spot)
purple lines
Some of the Glazed Tiles at A.A.
Many of the patterns, both of the glazed & the fireclay tiles are repeated, but in no regular order. Only a few of the patterns are here given.
The fireclay tiles are in very sharp relief, which has hardly at all been impaired, even where the tiles have come in direct contact with the fire.
White Ground
Purple dots
White Ground
purple dots
a blue pattern
Some of the fire-clay Tiles at B.
Black.
1660
VALDUS VANDE
part of Centre tile 'C' (to scale)
½ tile at ends.
× ×
figure varies a little in some of the ½ tiles.

(from sketches made on the spot)

Maison Hydraulique: Antwerp:
The Staircase.
[all oak]



Measᵈ (Mar '78) & drawn by J. Alfred Gotch

Maison Hydraulique: Antwerp
Old Oak Bench.

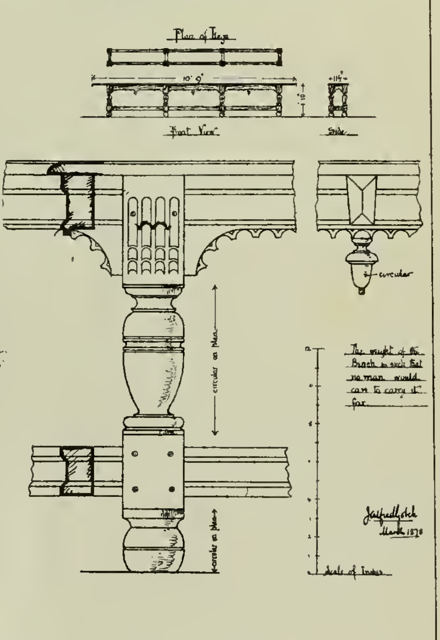

Plan of Legs
10' 9"
1' 6"
11½"
Front View
Side
circular
circular on plan
circular on plan
The weight of the Bench is such that no man would care to carry it far.
J. Alfred Gotch March 1878
Scale of Inches

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

THE RHIND LECTURES ON ARCHÆOLOGY.

DECORATIVE METALWORK.

ON Monday the first of another course of the Rhind Lectures in Archæology, in connection with the Society of Antiquaries of Scotland, was given in the Freemasons' Hall, Edinburgh, by Mr. J. Anderson, curator of the Antiquarian Museum.

Mr. Anderson said that in his last course of lectures on Scotland in early Christian times, he described those relics which were exclusively ecclesiastical. In the present course the general subject would be continued, and brought to a conclusion, by the description of objects which, though not exclusively ecclesiastical, yet connected themselves with those that were so, by the character of their art and associations. In the autumn of 1826, a shepherd passing along the hillside of Hunterston, about six miles from Largs, picked up a flattened ring of metal which he observed partially protruding from the soil. A square-headed pin, broken at the point, was attached to the ring by a loop at the back. The article was thus evidently a brooch, but it was remarkable for its size, its peculiar form, and the excessive richness and beauty of its ornamentation. Having passed into the possession of Mr. Hunter, of Hunterston, the brooch of Hunterston was now recognised as an example of artistic work in gold and silver which had few equals of its kind. After indicating the dimensions of the brooch and describing its appearance, Mr. Anderson said that the decorative metalwork of the brooch was peculiar both in its workmanship and in the character of its art. It was a species of granulated work, having the appearance of filagree implanted on gold plates. The character of the art was zoomorphic, the patterns consisting chiefly of serpents or lacertine creatures twisted and interlaced in the manner so characteristic of that school of Celtic art which produced the illuminated decorations of the manuscripts of the Gospels. That this correspondence in the style of decoration might be more clearly exhibited, not only in this particular instance, but in every instance in which the comparison might be necessary, Mr. Anderson exhibited enlarged representations of characteristic pages selected from the manuscripts—one being a page from the Gospels of Durron, attributed to the hand of St. Columba; another from a manuscript of the Gospels preserved, with the other Celtic manuscripts, in the Monastery of St. Gall, in Switzerland, founded by an Irish missionary in the beginning of the 7th century; a third, an initial letter from the Gospels of Lindisfarne; and a fourth, a copy of one of the decorated pages of the Gospels of Lindisfarne written in the end of the 7th century, for which he was indebted to Mr. W. Stevenson, a student in the School of Design. There was, Mr. Anderson went on to remark, no feature of design in the decoration of the brooch of Hunterston which was not also found in the decoration of the Celtic manuscripts of the Gospels. The art of the brooch was, therefore, the art of the Christian period. But there was more to be said of it than that. The elegance of its design was almost equal to that of the best manuscripts. The skill of its workmanship was such that it was questionable whether it could be greatly surpassed by the most skilful art workmanship of the present day. It was only when its details are examined with a magnifying glass that the fitness and beauty of their minutest rendering became fully apparent. Whether they considered it in its relation to this peculiar school of art, or in relation to the knowledge of technical processes, and the delicacy and skill of its workmanship, it was a work of art of no common merit. It was true that it might not commend itself to existing tastes as an article of dress; but its qualities as a work of art were to be judged by the rules of art, and not by the freaks which moulded the fleeting forms of fashion. Its design, its ornamentation, and its workmanship all alike told of a time when there was a feeling for art so pure, and a capacity for art workmanship so high, that if it were difficult to estimate their comparative relation to those of the present day, it was, at least, impossible to say of their manifestations that they were weak, ineffective, or contemptible. On the contrary, it was possible to say of them, and to say it with confidence, that they were far from being devoid of merit, that they possessed in no inconsiderable degree all the qualities which gave excellence to either art or to workmanship, and to affirm that he would now be considered an artist of eminence who should produce a design of equal merit, and he a workman of uncommon skill who should render it with equal delicacy and effectiveness. But there was another point of high interest connected with this brooch. It bore on the plain portion of the back of the flattened ring the autographs of two of its former owners scratched with a point in the surface of the silver. Both inscriptions were in the later and more local variety of the Runic alphabet, which was known as Scandinavian, and was thus distinguished from the earlier and more widely-diffused variety known as Old Northern. It could even be said of the letters thus scratched on the back of the brooch, that they belonged to a local variety of the Scandinavian Runes which was confined to an area so circumscribed as to comprehend only the islands of the west coast of Scotland. Passing to the consideration of the question whether this special form of brooch was Celtic or Scandinavian — in other words, whether it was a form which was typical—Mr. Anderson narrated the circumstances under which a hoard of brooches was found under a boulder by one of the workmen in the course of the formation of the Sutherland railway through the parish of Rogart in 1868, and described in detail the three brooches of that hoard which were now known to exist, adding that the rest had probably been melted as bullion. Nothing, he said, could arrest the continued destruction of similar objects but the wide dissemination of the knowledge that their value as bullion was exceeded by their interest and value as works of art—that they revealed to them a lost style of art, which it might be to the ultimate advantage of the decorative artificer of modern times to study and to imitate, and that they showed them how effectively the simplest modes of decoration might be associated with beauty of form and purity of design. But they posssessed a still stronger interest—not of a technical kind, and therefore not necessarily confined to a single class of individuals—an interest arising from the fact that they disclosed to them the existence in Scotland of an art faculty, of which, without them, they could have had no conception; and therefore an interest which must necessarily diffuse itself as widely as the existence of culture and taste in the community. (Applause.) Having briefly noticed other specimens of the same description of ornamental work known to exist in Scotland, Mr. Anderson directed attention to the fact that they had been dealing with a kind of brooch which possessed a marked individuality of character, both as regarded its form and its style of ornament. Its form was no less peculiar than the style of ornament with which it was associated. It was not a disc, like the Anglo-Saxon brooches, nor oval and bowl-shaped like the Scandinavian brooches, nor harp-shaped like the Roman brooches, nor a flattened circular ring like the later Highland brooches. It was penannular—that was, it was a ring which was not continuous, but had an opening, real or apparent, between its two ends. This was the special feature which made this special form of brooch a typical form. Even when the two ends of the ring were joined, as in the Hunterston brooch, the expanded ends were treated with reference to their ornament, not as if they formed part of a continuous ring, but as if they were two symmetrical endings which did not require to be joined. Having next discussed the question of the area of their typical form, Mr. Anderson said that the outcome of the detailed examination of the objects which he had described was—(1) that there was a special form of brooch which was Celtic and of the Christian time; (2) that this special form was penannular with expanded ends, having a long pin loosely looped on the ring of the brooch; (3) that this form occurred abundantly within the Celtic area, rarely outside of it, and then only in circumstances which showed that these outlying specimens were stragglers from the principal group; and (4) that while the area of the type included both Scotland and Ireland, the special variety of the type with which they had been dealing was more Scottish than Irish. In the course of the examination it had also become apparent that the art which usually decorated this type of brooch was the Celtic art of the Christian time—the same art which they had found to be the distinguishing characteristic of the manuscripts and shrines of the early Celtic Church, and which they had still to make acquaintance with as the distinguishing characteristic of the sculptured monuments which formed such a remarkable feature in the history of Christian art as associated with our country. Passing to the consideration of another group of objects in metal, characterised by the same art, but exhibiting a different phase of its development, and disclosing their connection with the system of symbolism, which was at once the most prominent feature and the profoundest mystery of the class of monuments with which they had to deal, Mr. Anderson gave a detailed description of the articles found by some workmen in the artificial mound, on the estate of Largo, in Fife, known as Norrie's Law, and said that the conclusions which emerged from an examination of the evidence relating to the silver relics in question were—(1) that the hoard was deposited in the sandy soil at the base of the Pagan gravemound; and (2) that the art which they exhibited was the same art which they had now traced upon the manuscripts, the book-covers, the bell shrines, the croziers and reliquaries, and lastly, on the brooches and personal ornaments of the Early Christian time in Scotland. There were other objects in silver and bronze which exhibited this art, but less prominently, such as the massive silver chains of circular double links which bore upon their terminal links several of the symbols of which he had spoken, occasionally filled with enamel. In closing, Mr. Anderson remarked that the logical outcome of all this description of decorated manuscripts, decorated metal-work, and decorated stone-work could be nothing less than the disclosure of a national school of decorative art, presenting qualities and characteristics which were by no means destitute of merit and suggestiveness, and might, therefore, possess a higher value and wider utility than mere curiosities in the history of art.

STABILITY AND STRENGTH OF STONE ARCHES.

THERE isone article in the current number of Van Nostrand's "Engineering Magazine," on the stability and strength of the stone arch, which has some interest. The author is Mr. George F. Swain, Providence, R.I. An attempt is made to discuss this vexed problem of construction from a new point of view, though how far the author has done so, we leave our readers to judge, after we have furnished them with his main conclusions. Mr. Swain bases his treatment of the arch on a theorem demonstrated by Professor Dr. Winkler, of Berlin, published in the *Zeitschrift des Architekten und Ingenieur Vereins zu Hannover* in 1879. He does not profess to say the method is new or perfect, but thinks it enables us to test the stability and strength of stone arches, with at least sufficient accuracy. A similar theory, in all essential respects, has been laid down by the late Professor Rankine in his "Applied Mechanics," and Canon Mosely's theory has also much in common with it; but the writer does not allude to these authors. The method is, in short, the old one of constructing a line of resistance within the middle third of the arch ring; but, it is believed, the only basis for such a theory is Professor Winkler's. This *savant* has advocated the elastic theory of the stone arch, and it is contended that, theoretically, it is the only one admissible; though the author of the paper we are reviewing believes there are practical difficulties in the way of its entire acceptance, and that a simpler method can be used in practice.

Mr. Swain enters at length into an explanation of the line of resistance, as generally understood, and defines it as a curve in the plane of the arch ring, or as "the locus of the centres of pressure on each section, perpendicular to the plane of the outer forces, and (in general) to the axis of the arch ring." Its construction, by the aid of determining the resultant of two forces, is described; but we shall not attempt here to repeat a process well understood by the mathematical reader, nor can we here enter into the solution of other points in regard to the connection between the stresses and the position of the line of resistance. The point of greatest importance, indeed, in all these attempts is to determine the position of the centres of the pressures in the joints. If the pressure approaches near the edge, the question becomes one of the crushing strength of the material; if it fall outside the joint, the arch is unstable, and its remaining strength is that of the mortar, whose tensile strength is disregarded. Hence it is necessary, for an arch to be in *equilibrium*, that the line of resistance must fall within the arch ring at every point; for its strength, that it must not approach near enough to either edge of the arch ring to crush the stone. Accordingly it has been found, and has been stated by Rankine and others, that the true line of resistance should everywhere lie within the *middle-third* of the arch ring. Of course it is possible for an infinite number of such lines to be drawn according to the external forces applied to the arch, but the true line of resistance is that which gives the smallest pressure on any joint; in other words, the line which lies between the two extremes of minimum and maximum horizontal thrusts. The author proceeds to argue that the true line of resistance will have a fixed position determined by the elasticity of the material, though this is acknowledged to be almost a practical impossibility to determine, as the modulus of elasticity in a stone arch is not constant, the stone and the mortar vary for almost every voussoir. To meet these difficulties the author proceeds to demonstrate a theorem founded on Winkler's. The theorem is as follows:—"For an arch of constant section, that line of resistance is approximately the true one which lies nearest to the axis of the arch ring, as determined by the method of least squares." The demonstration assumes that the loading is vertical, and that the line of resistance may be taken to coincide with the equilibrium polygon; but these assumptions do not create sufficient errors to invalidate the method for practical purposes. The three equations given are those to determine the position of the true equlibrium polygon for flat arches of constant section with fixed ends, as deduced by the theory of elasticity. Without diagram it would be useless to enter into the investigation minutely, or the construction proposed by the author for the curve representing the load on the arch. The author observes:—"The proof of Winkler's theorem is not changed, while the errors due to it are partly got rid of. . . Assuming the truth of Winkler's theorem in the case of arches subjected to forces slightly inclined, and whose section is not exactly constant, we are enabled to state generally the theorem: If any line of resistance can be constructed inside the arch ring, the true line of resistance lies within it also; hence, the arch is stable. For if *any* line of resistance can be so constructed, we can construct the maximum and minimum lines, and some intermediate line will be nearer the axis than either of these two." Graphically, the strength of an arch may be tested by the following method:—Draw an average line through the centres of joints at crown and springing for a given load, calculate the smallest value of the centre of pressure from the edge of joint, and lay it off at each joint from both extrados and intrados; then between the two curves thus found the *true* line of resistance must be made to lie. Hence, the author concludes that the stability and strength of a stone arch depends upon finding the position of the true line of resistance by the theory of elasticity; that its exact determination is impossible, from various causes, though it can be found within certain limits, these being governed by the crushing resistance of the material.

CHIPS.

A suggestion for an exhibition of portraits of unknown origin has been submitted to the South Kensington Science and Art Department, and the department has promised to give due consideration to what it terms a "useful suggestion." A suggestion for an exhibition of any kind always seems to find favour at South Kensington.

A coffee-tavern was opened at Bury-St.-Edmund's last week. The premises have been rebuilt from the designs of Mr. H. F. Bacon, architect, of that town, by Mr. J. Robinson.

At a meeting held at Poole, Dorset, last week, it was decided to take steps for the formation of a local School of Art, and Mr. W. Lankester was appointed hon. secretary.

At a parish meeting held at Framlingham on Monday, it was decided, in accordance with the suggestion made by a Local Government Board inspector, to adopt the deodorising principle at the outfall of the town sewers, in order to abate an existing nuisance.

Building Intelligence.

Bedford.—Holy Trinity Church was reopened on Sunday week, after internal renovation. The whole of the interior has been distempered in colour, and the chancel and sacrarium have been paved with Maw's tesselated encaustic tiles. The pulpit has been reduced in height and the panels removed from the sides, and a brass pulpit desk erected, new pitch-pine lectern, prayer-desk and seat, and oak credence table erected, new brass gas fittings erected throughout the church; chairs are substituted for benches in the centre of area, the heavy capping removed from side galleries, and heating apparatus by hot water introduced. Mr. John Day, of Bedford, was the architect; the painting and decorative works were carried out by Messrs. Clarke and Carling; the gas-fittings and re-lighting by Messrs. Kilpin and Billson; the woodwork by Mr. John Hull, all of Bedford; and the paving by Messrs. Maw and Co., of Broseley, Salop.

Blackburn.—The church of St. Peter was reopened on the 22nd ult. after considerable alterations. A chancel has been formed at the east end by removing five rows of pews, and constructing a raised platform 14in. above the level of the nave floor, as far as the first nave pier, and inclosed by a parapet wall of limestone and various marbles. The pulpit has been fixed upon a stone base in a position from which the north gallery, previously blocked, can be well seen. In the centre of the chancel wall are two steps of St. Anne's marble treads, with rouge Malplaquet risers; a third step rises to the sacrarium, having the tread of rouge Girote marble, with Bardilla marble riser, and the altar stands upon a fourth step, having a black and gold marble tread and a riser of Dent fossil limestone. The whole of the marble and stonework have been executed, as well as the foundations for the chancel and choir stalls, by Messrs. J. Varley and Sons, of Blackburn. The floor of sacrarium and chancel has been laid with encaustic tiling of quiet design, in harmony with the colours of the marble; it was supplied and laid by Messrs. Minton and Co., of Stoke-upon-Trent. The choir stalls are of Dantzic oak with carved and panelled bench ends. Separate lockers are provided for the choir, and special seats for the clergy. The whole of the joiner's work has been executed by Messrs. H. and A. Duckworth, Blackburn. A new iron staircase, with brass standards and handrail, has been fixed to the pulpit by Messrs. T. Thomason and Co., of Birmingham, who made the ironwork to the organ-front. The heating apparatus has been renovated by Messrs. Mercer Bros., Blackburn. The cost of the alterations (exclusive of organ-screen) will amount to about £550. The "singing gallery" in front of the organ has been removed and an organ-screen of Dantzic oak filled in with gilded organ pipes, with bracketed coved panelling under, and carved pendants and ornamental ironwork, has been substituted. This work has been carried out by Mr. Charles Porter, builder. The entire restoration has been executed from the designs and under the direction of Mr. A. R. Simpson, of Blackburn.

Beverley Minster.—A new screen dividing the nave from the chancel of Beverley Minster is completed, and replaces one of stone and Classic in character. The new screen is of oak, and was nearly the last of the late Sir Gilbert Scott's works. The design resolves itself into three divisions or bays, with the principal bay in the centre, a narrow bay on each side, and a half-bay at each end of the screen. Each of these divisions has a groined roof, the arches whereof rest on clustered columns, each pillar being in three stories or heights. In the second story of the pillars are alternate Tudor shafts, and in the story above are alternate niches and smaller columns. The niches are reserved for statues. Above the bays the screen is finished with a bold parapet, divided into sections and faced with the usual mouldings, enriched with running designs in conventional foliage. Pinnacles, rising from foliated trusses, mark the parapet into sections, each containing a niche presenting a draped statue already in position. Each figure is nearly three feet high. They represent King Athelstane, St. Nicholas, St. Mary, St. John the Evangelist, St. Martin, and St. John of Beverley. The screen has been carried out by a local artist—Mr. J. E. Elwell, Beverley, who took the work in hand rather more than four years ago. The tender was £2,800, but some additional work has been necessitated.

Bury St. Edmund's.—The chancel roof of St. Mary's Church has just been restored. The roof is a waggon-headed structure of the style of the first part of the 15th century; it measures 56ft. by 24ft. across, and is divided into five rows of panels, eleven in each row by half ribs, with half panels, a rich moulding, and elaborate coved cornice beneath, and all the intersections are marked by carved bosses, the ribs being extended half way between each boss into a lozenge. Scarcely two of the panels are exactly of the same proportions, and the mouldings vary greatly. Each of the 116 lozenges showed traces of a distinct subject, carved, gilded, and coloured, and the 60 bosses were similarly treated, the subjects being varied—including sacred, heraldic, floral, humorous, and grotesque. In the cornice were angels alternately attired in tunics and clothed in feathers, each bearing a scroll inscribed with a portion of the Latin version of the "Te Deum." All the colours and gilding have been carefully renewed in accordance with the original designs and colours, and those portions which were found blank, the result of former repairs, have been treated in harmony with the old work. Messrs. Burlison and Grylls, of Newman-street, London, W., have carried out the work; the actual artists being Mr. A. Macintosh, assisted by his brother. At the same time various structural repairs have been made in the chancel by Mr. Jackaman, of Bury, who recently accomplished the removal of the galleries from the nave.

Chideock.—The 15th-century parish church of St. Giles, Chideock, Dorset, has been reopened, after restoration effected at a cost of £1,300. The works included the removal of west gallery, reparation of belfry, rebuilding of north wall of nave and of the east and west walls of a north transeptal chapel, insertion in north nave wall of two new Perpendicular windows, the reflooring, reglazing, and reroofing of the entire church, covering the south aisle roof with new lead, laying 6in. bed of concrete beneath the new wooden floor, building of new transeptal, chancel, and aisle arches, with supporting buttresses, and fresh mortaring of interior and pointing and renewing the decayed stonework of exterior, including the restoration of the cusping in the cinquefoil head of south aisle windows. Mr. G. R. Crickmay, of Weymouth, was the architect, and Mr. John Beer, of Wareham, the contractor; the new stained glass is by Messrs. Lavers, Barraud, and Westlake, of Endell-street, London, W.C.

Halifax.—The new Wesleyan chapel of St. John, Halifax, has been opened. The chapel consists of a nave with clerestory, east and west aisles, east and west transepts, and organ chapel adjoining west transept. The length of the nave is 77ft. 4½in., the width (including side aisles) being 50ft. 8in., and the width across transepts 86ft. The principal entrance is by three arches at the north end, which open into a vestibule of cleansed ashlar. The eaves and clerestory have embattled parapets. There are three galleries in the chapel—one over the vestibule, and one in each transept, and the total accommodation is for 900. The columns are of Aberdeen grey granite. All the windows have tracery, and are filled with rolled plate cathedral glass, except a large rose window over the pulpit, which has been filled with stained glass, supplied by Messrs. Powell Bros., Leeds. The mural decoration at this end is also done by Messrs. Powell. On the ground-floor are a preaching-room, 30ft. by 28ft., four class-rooms, an infant school, and minister's and steward's vestries. Mr. Henry Wilson has been clerk of works. Mr. W. S. Barber is the architect, and the cost of the work is about £16,000.

Hartest.—The parish church of All Saints, Hartest, West Suffolk, was reopened on Tuesday week, after restoration. The building is of Perpendicular type, but is unusually square in proportions, the nave being but three bays in length, and the aisles being continued one bay into chancel. The chancel arch, which had been shored up, and the south aisle wall, which was supported at this point by a modern brick buttress, have been rebuilt in accordance with the original design—a panelled ceiling of oak, with moulded cornice and ribs has replaced the plaster and whitewash over the chancel. Two modern lancets in the east wall of chancel, which were out of keeping with any other portion of the church, have been replaced by a Perpendicular window of five lights. This is being filled with stained glass by Messrs. Burlison and Grylls, of London, the subject being the Crucifixion, with the Virgin Mary and St. John on either side. The external east wall of white bricks is left for the present unaltered, without buttresses or stone dressings. A new open-timbered roof has been placed over the nave, the old one having become insecure, and the aisle roofs have been repaired. Open benches of pitch-pine have been erected, and curious panels and devices found in the old pews have been worked into them. The Jacobean pulpit has been repaired, but the prayer-desk, altar-rail, and chancel fittings generally are all new, and of oak. New stone steps and tile pavements have been laid throughout, the chancel tiles being specially designed, and a new stone font and two Musgrave stoves supplied. Mr. J. Drayton Wyatt, of Holloway, London, was the architect; and Mr. Thomas Cadge, of Hartest, the contractor. The carving was done by Mr. Spurgeon, of Stowmarket, from the architect's designs.

Heythrop Park, Oxon.—On Tuesday last, the 28th ult., the Bishop of the Diocese consecrated a new church, which has been built in Heythrop Park by Mr. Albert Brassey, of Heythrop, the ancient edifice having for some time been found too small for the requirements of the population. The edifice has cost about £6,000 to erect, and in addition to his other munificent gifts to the parish, Mr. Brassey is building a rectory-house at an expense of about £4,000, besides having in 1877 provided a commodious school-room and Master's house. The new church consists of a nave and south aisle, with a tower forming a porch at the west end of the aisle, a chancel with an organ-chamber on the south and a vestry on the north, and there is accommodation for from 180 to 190 persons. The style of the church is Decorated, of the Geometrical period, from designs of and under the superintendence of Mr. A. W. Blomfield, M.A. It is built partly of the materials of the Roman Catholic chapel which formerly stood near the house, and partly of new stone, quarried on the estate. Milton stone has been used where a material of finer and more even quality was required, for carving, &c. The general dimensions of the building are as follows:—Nave length, 50ft.; width, 22ft. 4in.; chancel length, 30ft.; width, 20ft.; height of tower, 94ft. The roofs are of pitch-pine throughout, and covered with Broseley tiles. The chancel and sanctuary is floored with a pavement of Italian marble mosaic, by Messrs. Burke, of Newman-street. The chancel seats, the altar and pulpit, which are of oak and walnut, and the vestry screen of oak, were executed by the contractor, Mr. Alfred Groves, of Milton-under-Wychwood, who has carried out the whole of the works (and is the contractor employed in erecting the rectory house). The clerk of works was Mr. Callaway, of Heythrop, and Mr. Joseph Buckingham was foreman of works. The carving is by Mr. T. Earp, of Lambeth. The church is heated by Grundy's apparatus.

Metropolitan Board of Works.—This Board resumed its meetings on Friday, after a recess, when Dr. Brewer inquired if they had anything to do with the erection of the Temple-bar memorial. The chairman confessed he was unable to answer the question without notice. Mr. J. Jones said the Strand District Board of Works had had some correspondence with the Corporation on the subject, in which the Strand Board had offered a gentle protest against the want of taste displayed by the City authorities, especially in regard to the height of the memorial, and had suggested a material change in the design and structure of the erection. Mr. Deputy R. Taylor, on behalf of the City, asserted that the refuge would be not only ornamental, but extremely useful. Mr. Deputy Lowman Taylor spoke to similar effect. The members were very evenly divided on the subject, but a proposition to refer the matter to the works committee, in order, as the seconder explained, to justify the position of the Metropolitan Board in the eyes of the public, was carried by a majority of one. A letter was read from the Home Secretary with reference to the difficulties attending the provision of accommodation for the labouring classes dispossessed under the Metropolitan Streets Improvements Act of 1877. Sir W. V. Harcourt wrote that there appeared to him only two possible modes by which those difficulties could be solved—1st, that proposed by the Metropolitan Board, to bring forward next year a Bill to amend the 33rd section of the Act, and to obtain a full inquiry into the whole matter before a select committee; 2ndly, while the law remained unaltered he would be willing to consider an arrangement whereby successive portions of land might be cleared so soon as houses had been erected sufficient to provide for a number equal to those displaced. The letter was referred to the works committee. A communication was read from the Royal Institute of British Architects, stating that they are desirous of improving the character of the statutory examination of candidates for certificates of competency to perform the duties of a district surveyor in London; that they had discussed the advisability of imposing a moderate fee upon each candidate, and inquiring whether the Board would acquiesce in such a course. This letter was referred to the Building Act Committee.

CHIPS.

On Saturday, the foundation-stone was laid of a new building now being erected by the Corporation of Glasgow, across the Kelvin, in the West-end Park. It will be of lattice girder construction, of wrought iron, resting on freestone abutments. The span is 90ft., the breadth across carriage-way and footpaths, 24ft., and the height above water-level 19ft. It has been designed by Mr. Carrick, the city architect, who has also provided for a re-arrangement of the roads in the park. Mr. Watt is the contractor.

Memorial-stones of new Sunday-school buildings were laid at the rear of the Walworth Wesleyan Chapel, Camberwell-road, S.E., on Friday. The chief room is to be 32ft. by 60ft., with open-timber roof, and special measures are adopted to deaden the sound from the adjacent railway. There are also provided class-rooms, a library, a chapel-keeper's house, and offices. Mr. Chas. Bell, of London, is the architect, and Mr. Goad, of Camberwell, the builder. The cost is estimated at £2,300.

The last stone of the new headmaster's residence, now being added to the College at Dover, was laid by Earl Sydney on the 25th ult. The house is in the Norman style, and besides the headmaster's apartments, contains some 50 rooms for the accommodation of 60 borders, a large class-room, and other school adjuncts. The facing materials are flint, with Bath-stone dressings, and the cost has been about £7,000. Messrs Hansen and Walker are the architects, and Mr. W. J. Adcock, of Dover, is the builder.

In the description accompanying our recent illustration of the new buildings at University College, London, the name of the contractors for the engineering and chemical fittings, Messrs. Rosser and Russell, was spelt, wrongly, as Roper and Rupel.

At a recent meeting of the floods committee, held at Market Deeping, letters were read from Mr. J. B. Williams, offering to make a survey of the river, and to prepare sections and estimates for the sum of £70, and from Messrs. Kingston and Harrison, offering to do the same work for £50. The latter offer was accepted, and Messrs. Kingston and Harrison were instructed to make a report and proceed forthwith.

The new tower attached to Bathford Church, near Bath, was publicly dedicated on Wednesday week. In place of an insignificant builder's steeple has been erected one of the well-known Somersetshire type, square on plan, with a stair-turret at the south-west angle. On the west front is sculptured the figure of St. Swithin, and the west window has been filled with stained glass, by Messrs. Clayton and Bell, of London, representing Our Lord's Burial, and Appearances after the Resurrection. In the tower is a peal of six bells, cast by Messrs. Warner and Sons, London. Mr. Preedy, of Bath, was the architect, and Mr. Newman the contractor, and the total cost has exceeded £4,500.

A pilots' house, containing accommodation for 12 pilots, and having a flag-tower, has just been erected on Cain Island, for the Limerick Harbour Commissioners, from the plans and under the superintendence of Mr. W. Hall, their engineer. The official inspection took place on the 30th ult.

Christ Church, Spa, near Gloucester, has been reopened, after renovation and internal decoration carried out by Mr. Hyett, of Gloucester.

The Walsall Town Council, on Monday, agreed to raise the salary of the assistant borough surveyor, Mr. J. H. Shaw, from £130 to £150 per annum.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Correspondence.

THE EVILS OF TRAPPING IN CONNECTION WITH CLOSETS AND DRAINS.

To the Editor of the Building News.

Sir,—Owing to the impurity of the contents conveyed by house-drains and sewers, their interior surfaces are constantly generating and giving off what is commonly known as sewer-gas, and to effectually guard against the entrance into the dwelling of this insidious enemy is the desideratum aimed at by our foremost sanitarians of the day. It has been largely the practice to rely upon the water-seal of a trap to accomplish this purpose by obstructing its passage into the house. Mr. Rawlinson, the Inspector to the Local Government Board, in his official suggestions upon "The preparation of Plans for Drainage works, &c.," says, "wherever a trap is placed in a sewer or drain there should also be means for sewer and drain ventilation provided to relieve such a trap, as traps are only safe and useful in conjunction with full and permanent means for sewer ventilation." Now the sole purpose of a trap is to effect a seal entirely preventing the passage of sewer gas, whilst a ventilating pipe is intended to form a means for its extraction or escape, if, therefore, the water in the trap imperfectly performs its duties as a seal, and it becomes necessary to carry off and relieve it from the gas which has been either forced through under pressure or absorbed by the water on one side and given off again on the other, it is obvious that no reliance can be placed upon it. A trap unless constantly and freely flushed is a source of nuisance in many respects, obstructing the continuous flow of the sewage and generally becoming a receptacle retaining a certain quantity of sewage in the drain just beyond the particular inlet it is intended to guard, frequently silting up altogether and disseminating those deleterious gases it is its object to intercept.

A really trapless water-closet recommends itself as the most preferable description of apparatus on account of the following advantages it possesses over its trapped brethren.

1st. Greater simplicity of construction.

2nd. Less cost than a trapped closet of similar quality.

3rd. There is no water seal to get emptied out, either by evaporation or siphonage; neither is there any trap to be stopped up by the frost or choked with solids.

4th. No communication between the pan and the soil pipe (other than the sealed plug) as in the case of some closets having trapped overflows.

5th. There are fewer parts, thus rendering it less expense to keep in working order.

6th. A more forcible, direct, and efficient scour is obtained.

Several good specimens of the trapless apparatus are now in the market, though, by the bye, is it not rather paradoxical on the part of certain manufacturers to advertise a *trapless* closet having *trapped* overflow? The overflow from the pan should not be connected into the soil pipe, but carried through to the outside of an external wall, terminating with a light hinged trap flap, and empty over a grating, although by using water-waste preventers this is almost unnecessary. It is a well-known fact that the water-seal of a trap is practically useless when there is any great pressure of sewer-gas, which generally manages to work its way through, whereas the solid seal of the sealed plug in the trapless closet effectually prevents this, and the flush of water taking with it all impurities is considerably more powerful and direct when there is no tortuous passage through a trap, besides insuring a more perfect and efficient scour for the soil-pipe. Excreta appears to have a natural affinity for lead, and adheres to it with wonderful tenacity. I have seen 4in. soil pipes of lead which, when new, were as clean and smooth as the interior of a telescope and fixed vertically, fairly choked and stopped up after two years' use, whereas some pipes of galvanised iron, under similar conditions, were not nearly so foul. The drain, soil, and ventilating pipes should form one continuous flue from the cesspool or sewer to the roof of the house, no disconnection whatever should be formed in the shape of a trap anywhere between them; but a hinged flap fixed at the end of the house-drain would prevent any great amount of sewer-gas from passing up through it to the soil-pipe, whilst the trapless closet, as previously stated, effectually prevents its entrance into the dwelling, and it should be borne in mind that no foul atmosphere can enter *up* through this apparatus when the plug is lifted, the flush of water always carrying with it a strong *down* rush of fresh air each time it is used, which, with a trapped closet, would be impossible whilst the ventilating tube, continued up from the soil-pipe, its full diameter, would form the most natural outlet for any dangerous gases arising from below. It is a noteworthy fact that the extracting or drawing powers of a ventilating pipe when heated by the sun shining on it are very considerable, fully equalling the best mechanical contrivance yet invented, whilst under ordinary circumstances it abundantly fulfils its mission. By adopting the foregoing method, all traps between the closet and the receptacle (either sewer or cesspool) are entirely dispensed with.

I am fully aware that such an arrangement is not in accordance with the model by-laws of the Local Government Board, but it has been found from practical experience that it is admirably adapted to meet the ends in view. *The American Sanitary Engineer*, reporting on the regulations of the New York Board of Health, says, "the Board enforces that there be no traps on vertical soil-pipes, air admitted by ventilation above the seal and passed all through a trapped house-drain is found by experience to be fouler than air drawn from a sewer, and Mr. Bailey Denton in his excellent work on Sanitary Engineering says, "there is so much probability of an evil arising sooner or later from the use of a trap disconnecting the soil-pipe of water-closets from the sewer, which would in itself be as great as that which it is intended to remove, that I consider it better not to break the continuity."

The water-seal of traps can be unintentionally removed altogether from three separate causes, thus leaving the house in direct communication with the sewer and causing the very evil they are intended to obviate.

1st. By evaporation, when it is little used; and what is more common than to find, after a house has been vacated if only for a short time, that the water in the traps has evaporated?

2nd. By siphoning, through a continuous current running full bore, and also by a down-coming stream of water compressing the air in front and making suction behind.

3. By capillary attraction, the contents of traps may be entirely sucked out by these means through the agency of a piece of rag or other absorbent material lying partly in and partly out of the trap.

Taking it for granted that a hinged flap at the extremity of the house-drain would allow a certain quantity of sewer-gas to pass through to the soil-pipe, it would naturally be carried up and out at the top by the ventilator, and as previously explained, on no account could it enter the dwelling through the solid seal of a trapless water-closet, assuming however for the sake of argument that a portion had by some means effected an entry into the house, the air from a well ventilated sewer or cesspool would be greatly preferable and considerably less dangerous than that from putrefying deposits which had accumulated in a trap, silting it up and developing and giving off those foul gases so detrimental to life and health. My own opinion is that traps are to be condemned, and ought not, under any circumstances, to be used in conjunction with water-closets, and soil-drains, but are only safe and useful when applied to wastes from sinks and baths, &c., where there is no pressure of sewer gas, and not even then unless frequently flushed and easily accessible. By a judicious use of solid seals to the water-closet apparatus, which when necessary can easily be renewed, combined with a thorough and efficient ventilation of the drains as well as destroying the foul gases by a free use of disinfectants, thus purifying the atmosphere and neutralising and rendering the impurities harmless—those sources of continual annoyance, traps, can in a great measure be dispensed with.

In conclusion, a word respecting the present rage for patent sanitary appliances may not be out of place. This seems ever-increasing, and the competition is now remarkably keen between the numerous makers, some of whom pirate and adopt each others' ideas and inventions in the most serene manner; and it is surprising to notice the trivial and in some instances almost silly things for which patents are taken out. True there are some really good and useful inventions in the market, but the majority consist of imitations and slightly altered adaptations, some utterly worthless, and the public are induced to purchase through the puffs and plausible but apocryphal statements contained in many of the circulars and advertisements of these contrivances for house-sanitation, so-called sanitary appliances, frequently unsightly and seldom attaining their professed ends, a good and useful invention is sure to have a host of imitators who alter and modify (and sometimes do actually improve upon it), that although the principle remains the same, the component parts differ so that it is scarcely recognisable, and the result is So-and So's improved registered. Their different points must be carefully considered and their advantages determined and utilised by the engineer, according to their qualifications in meeting the essential requirements for the maintenance of health.—I am, &c.,

Cheltenham. G. A. Foster.

IRON IN PORTLAND CEMENT.

Sir,—Your correspondent, Mr. T. H. Duke seems to be much alarmed at the prospect of the future Portland cement being made without an admixture of oxide of iron, and appears to treat its presence in a metallic condition as a "secondary matter." If Mr. Duke will look about him and seriously examine with a critical eye the various building stones, he will find that the most durable are those which have the smallest quantity of iron in their analysis. The best building stones being those which are purely silicious, while others having oxide of iron in their paste or matrix are liable to premature disintegration. The Cathedrals of Carlisle and Chester have suffered decay to a much greater extent than Lincoln or York minsters, simply because the stones of which the former were built have a much larger percentage of oxide of iron in their composition than the latter. Hence careful builders who have any regard for the permanency of their structures prefer those stones which are freest from an admixture of metallic oxides

In the cement direction, experience has shown that puzzolanas and trass used so freely by the ancients and Romans, mastic and "iron" cements by the modern builders, are no longer regarded as reliable binding agents, because of their having an excessive proportion of oxide of iron, in comparison with the lime, in their analysis. If oxide of iron in a very small and almost inappreciable extent, exists either by accident, or naturally, in plaster of Paris, or its artificial compounds of Parian and Keene's cements, they become practically valueless, and much damage and loss has frequently arisen owing to the presence, from careless manipulation, of a very small quantity of free iron becoming mixed with the powder during the grinding process.

It is almost superfluous to refer to iron and glass, so familiar to every one; but it is notorious that the greatest care bestowed by the use of protective paints on the iron fails to preserve it from oxidation, while the other maintains its normal condition comparatively free from waste or deterioration. We find but few traces of the iron used in old buildings, while the sandstones of which the walls were built remain in a more or less perfect condition.

These are lessons which may be read and understood by the most ordinary intelligence, and the first duty of the constructive agent, whether cement-maker, quarrier, or brick-maker, therefore, is to reject in all their operations that natural material which most readily succumbs to atmospheric influences. Air, one of the elementary principles of the ancient, is not the only destructive agent, for fire, another so classed element, while readily burning iron fails to destroy, except under special and exceptional conditions, a "Dinas" fire-brick, which is composed of nearly pure silica.

All careful experience in Portland cement manufacture and use has proved, that when that material is of a brown colour, it never attains to a high position of profitable induration. The cause is due to an excess of aluminium in combination with oxide of iron, and hence the desire of the intelligent maker to obtain the purest clay with which to impart to the carbonate of lime the desired property of hydraulicity. Those engineering tests made during the last twenty years illustrate this point in a very convincing manner, for while the tensile value of Portland cement increased, it was accompanied by an improvement in its colour. Some cement makers, like your correspondent, Mr. Duke, had formed the erroneous impression that "for all practical purposes, for all the reasonable requirements of this work-a-day world, a cement containing oxide of iron is, I maintain, as good as any other," and accordingly pressed their over-clayed cements in competition with those having exact proportions of that ingredient. They signally failed, however; for while their products passed with success the water and weight members of the triple test, they failed to reach the moderate tensile value at that time required of them. It is the general complaint of manufacturers, that to compete in the constantly increasing demand for cement of high tensile value, they are compelled to increase the carbonate of lime proportions, or in other words, lessen the quantity of the clay or silica agent.

These facts should be thought over by your correspondent, who does not seem well posted up in recent Portland cement progress, or he would not resist so speciously the elimination of iron from the raw material of which it is composed. If Mr. Duke rests his argument for the continued use of oxide of iron on the "abundant stores of Nature, which she has so prolifically scattered abroad," it can readily be answered by the well-known fact that silica is much more plentiful, and as it is better suited for cement-making purposes, it should have the preference. Besides I have endeavoured to show that while on the one hand Nature is incessantly at work to destroy the oxide of iron, it harmlessly (at least within moderate periods) assails the silica.

The "almost vital" question, as Mr. Duke puts it, rests more with the consumer than the producers, and if the latter "can combine in a profitable manner" the oxide of iron for which your correspondent seems to have such special regard, all the better. The tendency of the present wave of improvements in the Portland cement industry and use, is to increase its strength, and it is found that success in that direction is incompatible with a large proportion of oxide of iron in the clay from which in combination with carbonate of lime it is produced. The fact of the great difference between the German cement which I used in my experiments and some of the English samples, show that where the smallest quantity of oxide of iron exists the highest tensile values are obtained. I did not show this in my "iron in cement" examinations; but it is notoriously so, and a reference to some of the recently published lists of experiments will prove to your correspondent the advisability of using as little oxide of iron as possible in the manufacture of Portland cement. There are very strong but expensive silicious cements, and excellent artificial stone, made entirely of silica, with a binding agent, in which oxide of iron forms no part.

That all Portland cements have, more or less, oxide of iron in their constitution, is no reason why the practice, if it militates against its improvement, should be continued. Cast and wrought iron were for many years regarded as the only condition in which the metal could be used for constructive purposes; but advancing science has led to their being superseded by the more valuable preparation of steel.

That free iron is present in but limited quantities in Portland cement is apparent from my examination, and under ordinary circumstances, may be attributed to the wear of machinery by which it is prepared and reduced. He might as reasonably complain, however, of the wear of our teeth in the exercise of their special duty in the human economy, as to blame the machinery which brings down the obdurate cement clinker to the marketable powder of commerce, and in the process of reduction leaves finely comminuted portions of the metal of which it is composed behind.

Your correspondent does not seem to realise the scope and object of the article "Iron in Portland Cement," or he would not say that it amounted to "a wholesale condemnation of such cements [meaning, of course, those that were examined for the purposes of the article] for the sake of an unrealisable dream of theoretic perfection."

Let Mr. Duke set about the study and examination of Portland cement from its chemical as well as its constructive points, and I venture to predict that he will soon get reconciled to the absence of oxide of iron, about which he seems to have imbibed more than ordinarily irrational ideas; at least, such is the opinion of

The Writer of the Article.

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The third session of St. Paul's Ecclesiological Society will be opened on Thursday, November 4th, by a lecture at St. Paul's Chapter-house, from the Rev. Mackenzie E. C. Walcott, B.D., F.S.A., upon "Old St. Paul's." A fortnight afterwards, the Rev. J. B. Powell, M.A., will read a paper upon "Ecclesiastical Colours," and the *conversazione* is arranged to take place on Thursday, December 9th.

At a special meeting of the town council of Newport, Mon., held on Tuesday week, it was decided to carry out a scheme of street-improvements at an estimated cost of £10,000. An inquiry into the application for a loan for the purpose will take place on Tuesday next before Mr. J. Thornhill Harrison, C.E., an inspector of the Local Government Board.

Intercommunication.

QUESTIONS.

[6252.]—**Groined Ceilings.**—Could any one inform me of a good work upon the above, especially with regard to the proper way in getting out the "Jack ribs" from angle to angle?—A Native.

[6253.] — **Half-Timbered Building.** — Grateful thanks to subscriber who will kindly inform me about price per cube foot, say, for a cottage building to height of first floor (10ft.) of walls of concrete 14in. thick, chamber-floor about 9ft. high to roof plate of wood, framed work and vertical tiled?—P. Rolyns.

[6254.]—**Roof Tiles.**—What are the usual description and size of roof tiles, and what gauge? Should vertical tiling be bedded in mortar, and what gauge? Also price per square laying only.—Ouln Ireland.

[6255.]—**Warming Conservatory.**—Wanted, the best and cheapest means of warming a small conservatory, size about 12ft. by 10ft., otherwise than by means of hot air or water pipes, or flue. If a stove, which sort and name is best suited for the purpose?—W. H.

[6256.]—**Internal Walls of Dwelling Houses**—I have remarked that in the dwelling houses illustrated in the Building News from time to time that the internal division walls which have to support the floors and roofs are made only 9in. thick, in small houses 4½in. thick. The provincial architect that I served my time with always used good thick internal walls, and the floor joists could be placed according to the shape of rooms. I would feel very much obliged to some kind reader who would inform me if the 9in. walls are the proper thing. It strikes me that in a one-brick wall, if there be only one plate for joists, and these run through walls, that the work will be unstable, having only a space of about 2¼in. at each side of plate, insufficient for a half-brick, and should there be two plates (or one wide one) the wall would be divided by a layer of wood, which would be liable to rot. I ask this query as many of the houses I allude to are by eminent architects, and I would not expect them to use inferior construction.—One in Doubt.

REPLIES.

[6221.]—**Ventilation.**—I have once or twice before advocated, in these columns, the use of simple 3½in. iron elbows for the admission of fresh air to rooms. They, of course, can only be employed where you can get direct communication with the outer air. In other positions tubes have to be used. The advantage of having an L-shaped pipe of this sort is that they are not in the way of tables or sofas, &c., like the ordinary tubes or cases are. I build the socket end of the elbow horizontally in the wall, enlarging the opening to about 6in. outside, where I put a cast-iron grating, at the back of which I fit a piece of perforated zinc. At the other end of the elbow, which shows vertically in the room, I fit a piece of wire netting, with a mesh of about ¼in., not less, because it is important not to obstruct the inlet of air. The only object of this netting is to prevent anything being put into the pipe. It is a mistake to consider it necessary to place the top of these pipes more than 3ft. from the floor. The air, like a jet of water, expands gradually as it leaves the mouth of the pipe. The objection to placing the pipes higher is that, unless the rooms are lofty, the cold air strikes against the ceiling and is felt by persons in the room. Pipes for the admission of fresh air should be placed on all sides of a room, the pipes on each side having, where possible, communication with a different front of the house. By this means air is admitted, no matter what quarter the wind is in. It strikes me that in situations where you can only admit air at the front and back of a house, it would be a good plan to have pipes turning to the right and left so as to catch the wind. As regards outlet ventilators, I have always found Boyle's talc ventilators answer the best. They are usually placed in the smoke-flue near the ceiling. In one or two instances where they have been fixed by inexperienced or careless workmen, I have known the ceiling to become blackened by smoke finding its way out. The cause has generally been that the talc flaps have got injured before being fixed, but once I found that too much putty had been used for bedding the plate which contains the talc flaps to the rebate of the box or frame. Some of this superfluous putty had got under one of the flaps and thus prevented its closing flat against the plate.—C. F. M.

[6238.]—**Weight of Iron Rafters.**—Ascertain the sectional area in square inches, and multiply by 3⅓. The product will indicate the weight of 1ft. run in pounds. To obtain the sectional area without calculation, make a mould of the section in sulphur or plaster, say 1-16th of an inch deep, and well cover the bottom with a single layer of fine mixed shot. Then place the same shot into a rectangular mould, and by measuring the length and breadth of the surface covered by the single layer, you can find the square area required.—C. Baassch.

[6246.]—**Pumps.**—"Hector" inquires about pump for one man for 100ft. in depth. If not better suited let him inquire of Messrs. J. Tylor and Sons, 2, Newgate-street, London, E.C. Their No. 215 rotary action would probably suit his wants perfectly, as being easier in action than the handle arrangement on face of plank, either directly over the well or with horizontal shafting when the well is at a little distance. Roughly the articles would cost about £20, without labour of fixing I presume. Their artesian pumping apparatus, Ordnance pattern, seems to be a little dearer, although apparently much stronger in make. The goods are of first-class quality all through.—Deep Well.

[6248.]—**Yorkshire Abbeys.**—A very good map of the abbeys and castles of Yorkshire is published by Mrs. Watson Chapman, the Minster Yard, York. Also I see there are two useful Yorkshire tours given in "Notes on Sketching Tours," by Henry Taylor, published by Batsford, of Holborn.—W. S. Churchill.

[6248.]—**Yorkshire Abbeys.**—"North" will find "A Map of the Abbeys and Castles of Yorkshire" published by Mrs. Watson Chapman, the Minster Yard, York, price one shilling, give him the information he requires.—L. S.

LEGAL INTELLIGENCE.

District Surveyor's Fees Disallowed.—At Marlborough-street Police-court on Wednesday, the 6th inst., Mr. Edward Cock, builder, 137, Wardour-street, appeared before Mr. Mansfield, in answer to a summons taken out against him by Mr. Robert Kerr, district surveyor for the parish of St. James's, for the non-payment of £1 15s., which the complainant alleged was due to him as a fee in connection with the surveying of some repairs done to the house 45a, Carnaby-street. Mr. Alsop appeared for the defendant. The complainant stated that the house in question was condemned as unsafe by the Metropolitan Board of Works, and that the defendant made the necessary repairs. There was due to witness, as district surveyor, a fee of £1 15s. In cross-examination by Mr. Alsop, witness said that the repairs done were not simply the filling-up of one or two cracks under one of the windows; the repairs were much more serious than that. He considered that he was entitled to what he had charged, in accordance with the clauses of the Metropolitan Building Act. Mr. Alsop, for the defendant, said that the repairs which he made, and which consisted simply of the filling up of two small cracks under the window, only came to £2 5s. The defendant had already paid £1 1s. 6d. to the Metropolitan Board of Works, and the complainant now sought to recover £1 15s. for surveying the building, which he (Mr. Alsop) contended he had no right to recover, as he had already had a proper allowance from the Metropolitan Board. In reply to the magistrate, Mr. Alsop said that the house was built 23 years ago. Mr. Mansfield, after looking at the Act of Parliament, said that it was never intended to apply to the case in question, or that it should be put in force for the purposes of extortion. He would dismiss the summons, and the complainant could, if he thought fit, take the case to a superior court.

STAINED GLASS.

King's Norton.—A stained-glass memorial window will shortly be fixed in the east end of the north aisle at King's Norton Church. The window is of three lights, the subject being "The Ascension," and in its treatment the artist has travelled out of the ordinary course by omitting the orthodox canopy under which the figures are placed. In the head of the centre light is a figure of the ascending Saviour, and the heads of the two side-lights and the tracery of the window have groups of angels representing the heavenly chorus. The eleven Apostles are represented at the foot of each of the lights, and in the intervening spaces are clouds, which have been treated in as natural a manner as the material would permit. The pose of the Saviour gives an excellent idea of floating upwards. The Apostles are represented in various attitudes of adoration. The window has been treated in realistic manner, in accordance with the wish of the committee, by the artist, Mr. Swaine Bourne, of King's Edward-road, Birmingham.

Morecambe.—A two-light stained-glass window has, during the past week, been erected in the parish-church, Morecambe. The window is of the style of the 13th century. The subject of the right-hand light is the "Raising of Lazarus," in a panel beneath which is a seated figure of the Prophet Isaiah, who bears on a scroll a text sympathetic with the subject above. The subject of the left-hand is the "Raising of Jairus' Daughter," and in the panel corresponding with that of the Prophet Isaiah is a seated figure of King David, whose scroll bears the text, Psalm 23, 4 verse. The panels bearing figures of the prophets are divided from the principal subjects by small arcaded canopies, a similar feature again dividing the subjects from the grisaille work which fills the head and base of the window, and which is pierced with medallions in rich colour, bearing emblems of the Four Evangelists. The window has been designed and executed by Messrs. Shrigley and Hunt, of John O'Gaunt's Gate, Laucaster, and 28, John-street, Bedford-row, London, W.C.

Christ Church, Dublin.—Four transept windows in this church have recently been filled with stained glass, introducing figures of the Four Evangelists. The windows have been executed by Messrs. Heaton, Butler, and Bayne, of London, under the supervision of Mr. J. Rawson Carroll, architect, of Dublin.

STATUES, MEMORIALS, &c.

Major Whyte Melville.—A fountain, erected at St. Andrews in memory of the late Major Whyte Melville, has been completed. The stone used is principally Dumfries red sandstone, contrast being secured by the introduction of columns and copings of polished Dalbeattie granite. The lower basin of the fountain, which, like the two higher, is of red sandstone, but has a granite coping, and is approached by a step of the same material, measures

14ft. in diameter and rises 3ft 4in. above the ground. From the centre of this basin there rise a cluster of five granite columns, four of them, about 6in. in diameter, surrounding the fifth, which is, as it were, the bearing column, and is 1½ft. in thickness. These shafts are surmounted by carved capitals of sandstone, which, in turn, support the second basin. On this basin, which is quatrefoil in plan, a great deal of work has been bestowed, the stone being elaborately carved in designs representing water plants. On each face of the quatrefoil there is placed a medallion in white marble—one showing a bust in bas-relief of the late Major Whyte-Melville, by Mr. J. C. Boehm, A.R.A. The third stage of the fountain is a reproduction of the second on a smaller scale. Above this there rises a handsome moulded finial of red sandstone, carrying the fountain to the height of about 14ft. from the ground. Water will be discharged from gurgoyles, four of which are disposed round the second and four round the third basin, as well as from five jets, four of which are on the second stage, while the fifth is concealed within the finial.—A tombstone has also been erected at Tetbury, estimated cost £170, consisting of a large slab of white marble, bearing an inscription, and having crosses at either end—one 6ft. high, decorated with carving of laurel leaves and passion-flowers, and the other 3ft. 6in. in height, showing the letters I.H.S., with other appropriate emblems.—A memorial in the Guards' Chapel, Wellington Barracks, on which the same sum has been expended as on the tombstone, is a piece of mosaic work, 10ft. in height, representing the fight of St. George and the Dragon, and having appended the inscription—"Soldier, sportsman, author: 'George John Whyte Melville's memory is here recorded by his old friends and comrades of the Coldstream Guards." The designs for all three monuments were prepared by Mr. Edis, F.S.A., London; the carving was executed by Mr. Earp, sculptor, London; and the work of erecting the St. Andrews fountain is in the hands of Mr. G. Wallis, London.

Newcastle-on-Tyne.—On Thursday, the 30th ult., the memorial erected by public subscription to the memory of Charles Larkin in Elswick Cemetery was unveiled by Mr. Joseph Cowen, M.P., in the presence of a large concourse of people. The memorial is Classic in style. It consists of a broad base arranged in step form, upon which is placed a square pedestal, panelled on all four sides, and finished with curved ogee pediments and a dentil course. Above this is the bust of the late orator surmounted by a pedimented canopy carried on four groups of clustered columns with Ionic caps. The canopy is domed internally, and externally finished with a richly carved and moulded monumental urn. The whole has been executed in Denwick stone by Mr. G. Burn. Messrs. Oliver and Leeson were the architects.

Monument to the late James Cassie, R.S.A. —The monument to the late James Cassie, R.S.A., which a number of friends agreed should be erected by means of private subscription, over the grave in the Dean Cemetery, Edinburgh, was placed in position on Tuesday. Designed by Mr. George Reid, R.S.A., and executed in red granite by Mr. Alexander Macdonald (of Macdonald, Field, & Co., Aberdeen), the memorial resembles in form one of those crosses frequently met with in the West Highlands. The monument will rise to a height of eleven feet from the ground. The span of the arms of the cross measures 3ft. 9in., and the diameter of the wheel connecting these with the upright, 2ft. 3in.

Kemerton.—A memorial to the late Archdeacon Thorpe, who died in 1877, has just been placed in Kemerton Church, near Bristol, in a recess left for the purpose, when the chancel was rebuilt in 1845. The back of this recess has been filled with diaper work, copied from an example in Canterbury Cathedral, and on the floor, raised a few inches above it, is a recumbent figure of the late archdeacon, vested in surplice, stole, and hood, and bearing between his hands a chalice resting on his breast. The figure is treated in an unusual manner, being incised in bold lines on a slab of Red Emperor marble; the lines are filled in with black mastic, the larger spaces, such as the stole and shoes, being of black marble. Round the figure is a diaper in yellow Siena and black marble, while the head reposes on a diapered cushion. The whole surface, which is perfectly flat, bears a high polish. The work has been done under the direction of Mr. R. Herbert Carpenter, of London, whose late father restored the church. Messrs. Clayton and Bell, of London, designed the incised slab, and the whole work has been carried out by Mr. George Hill, of Chelsea.

WATER SUPPLY AND SANITARY MATTERS.

Sewer Ventilation.—The Cornish town of Padstow furnishes evidence of the value of the ventilation of sewers. Acting on the recommendation of the Local Government inspector, the Local Board have during the last eighteen months put into practice the course advocated by the sanitarians recently assembled at Exeter—that of ventilating sewers so as to permit sewage gas to escape into the atmosphere as soon as it is generated, and before it becomes dangerous to the public health. As a result, the town has during the last twelve months enjoyed complete immunity from zymotic diseases.

CHIPS.

New Board schools at the Lyng, West Bromwich, were opened on Monday. They are planned in three departments, and accommodate 826 children. They are erected in Domestic Gothic style of plain character, of brickwork, relieved by stone dressings and bands of blue brick. The contractors were Messrs. Jones and Son, of Sedgley, and the cost has been £3,960, the total outlay, including cost of site, being about £6 12s. per head. The designs were by Mr. E. J. Etwell, of West Bromwich, and were selected in competition.

An inquiry was held on Thursday week at Epsom before Mr. Henley, a Local Government inspector, into an application that had been made by the rural sanitary authority for certain powers for the parish of Ewell. Dr. Jacob, the medical officer of health, and Mr. Richardson, sanitary inspector, supported the proposal, showing that about 80 or 90 new houses are about to be erected in the parish, which has no public scavenging, and is filled with cesspools. Considerable opposition was manifested by residents, and it was stated that the new houses would be supplied with Moule's earth-closets, and would be semi-detached.

Two new branch lines of tramway in Derby, through Ashbourne-road and Osmaston-road, were inspected by Major-General Hutchinson, R.E., on Thursday week, and have since been opened for traffic. The lines have been constructed by Messrs. Moseley and Co., contractors, of Clifton, and the engineers were Messrs. Kincaid.

The town commissioners of Armagh received, on Monday, the sanction of the Irish Local Government Board to a loan of £8,000, for the construction of works of water-supply for that town.

St. George's parish-church, Wolverhampton, was reopened on Sunday, after internal renovation, and decoration in colour. The inside walls are now fawn colour, the ceiling tinted in turquoise-blue; and the ribs are picked out with cream colour and buff, and the bosses and caps of columns with turquoise-blue, gold, and vermilion, and stencilled ornament is applied to the dadoes. The work has been carried out by Mr. George Lewis, of Wolverhampton.

At a recent meeting of the Council of the William Salt (Staffordshire) Archæological Society it was decided to publish, in 1881, the Pipe Rolls for Staffordshire during the reigns of Richard I. and John—early charters (s. d.) from 1060 to end of John's reign, and some of the earlier rolls of the Curia Regis. The annual meeting was fixed for December 29th.

Mr. R. Argile was reappointed engineer to the local board of Ripley, Derbyshire, last week, and at the same meeting Mr. C. Shelton was appointed sanitary inspector.

The Corporation of Dublin decided, on Monday, to invite the Social Science Association to hold its congress for 1881 in that city. The congress was held in Dublin in 1861.

A new Wesleyan chapel was opened at Shifnal on Wednesday week. It is Geometric Gothic in style, and is built of red brick, relieved with Grinshill stone and red terra-cotta dressings, and the roof is covered with Broseley tiles. Internally the chapel is 62ft. 6in. long by 38ft. wide, and accommodates 350 on the ground-floor, and a proposed end gallery will provide 100 other sittings. A stone turret, 80ft. high, is placed on one side of the main gable. At the rear are a schoolroom and two vestries, and adjoining is a minister's house. Mr. J. H. Fleeming, of Wolverhampton, was the architect, and Mr. Yates, of Shifnal, the builder; the hot-air apparatus is by Mr. Truswell, of Sheffield. The total cost has been £3,000.

A Local Government Board inquiry was held at Epsom on Tuesday with reference to an application from the local board of health for leave to borrow the sum of £1,200 for the purpose of carrying out drainage works on the common.

Extensive timber works and stores at Shieldfield, Newcastle-on-Tyne, belonging to Mr. Nathan Watson, timber-merchant, of that town, were destroyed by fire on Wednesday week.

The parish-church of Featherstone, near Knaresborough, is undergoing restoration, including the rebuilding of the south side, the lowering of the floor, and the substitution of benches for pews. The work is being carried out by Mr. Freeman, of Featherstone.

Our Office Table.

The City and Guilds of London Institute has announced that it is prepared to award a limited number of free admissions to certain technological classes at University College and King's College. The subjects of instruction at University College embrace Chemical Technology, under Prof. Graham, and Mechanical Technology, under Prof. Kennedy. The laboratory instruction in Chemical Technology includes the chemistry of the alkali trade, soap, glass, pottery, cements, brewing, and agricultural chemistry, and in the award of these free studentships already engaged in chemical works who possess an elementary knowledge of organic chemistry. Prof. Kennedy's class and laboratory instruction will be occupied, the first term, with machinery and plant used in the manufacture of iron and steel, preference will be given to candidates who are with special reference to modern processes in steel-making; and, during the second term, with machinery and apparatus used for testing strength of materials, and for measuring strains. In awarding studentships to these courses, the Institute will give preference to foremen and others engaged in mechanical works. At King's College free admission will be given to the classes on Metallurgy, under the direction of Prof. A. R. Huntington. The laboratory for instruction is open from 10 till 4, on Friday evenings from 7 till 9. Among the subjects treated in this course will be the principal properties of metals, preparation of alloys, and methods of assaying. Free admissions will also be given to the classes in practical Fine Art, under the direction of Prof. Delamotte, and here, as in the other courses, the awards will be made to students belonging to the industrial classes who might otherwise be prevented by the expense of the fees from attending these classes. We are requested to state that application for these free studentships should be sent, in the first instance, to the Director and Secretary of the City and Guilds of London Institute, Gresham College, E.C.

The experiment of paving with asphalte between and outside the rails of a street-tramway having proved in Newington, S.E., a costly and dangerous failure, the London Tramways Co., the owners of the system of rails, are now having the roads so treated repaved with wood blocks and granite rail margins. A general contract has been made with Mr. James Watt, of Peckham, for the execution of this work at the rate of £8,000 per mile, and it is being done under the superintendence of Mr. Welling, acting on behalf of the tramway company. The first section undertaken is the upper part of the Walworth-road, some 350 yards length of thoroughfare between the hotel and the railway-station severally known as the Elephant and Castle, and since Monday week a large staff of men have been employed on the work. The asphalting has been entirely removed, and a foundation of Portland cement and ballast concrete, in the proportion of two to one, laid. The longitudinal planking on which the rail formerly rested having been found insecure and liable to sink, this is replaced by cross-sleepers, to which steel rails of improved pattern are secured by the usual iron chairs and fish-plates. Within and without the rails a single row of granite pitchers, 6in. by 3in. by 3in., is laid, breaking joint on either side with the prepared blocks of the Improved Wood Paving Company. The Newington Vestry are at the same time repaving with these blocks the spaces between the rails and foot pavements. As soon as this street is finished and reopened for traffic, a portion of the New Kent-road will be dealt with in the same way.

The new session of the Royal Institute of British Architects will be opened on Monday, the 1st November, by an address from the President, Mr. John Whichcord, F.S.A. Amongst the other business of the evening will be the election of an honorary secretary, in succession to the late Mr. T. H. Wyatt; Mr. J. Macvicar Anderson has been nominated by the Council to fill the vacancy, and is now acting *pro tem.* The first Institute meeting for the reading of papers is fixed for the 15th prox., but the subject has not yet been announced. The Architectural Association will inaugurate their session by a *conversazione*, at 9, Conduit-street, on this day three weeks, the 29th inst.; and on the following Friday, the 5th November, Mr.

Ernest C. Lee will deliver his presidential address, the first meeting for the reading of papers being arranged for Friday, the 19th prox.

The Corporation of Dublin have recently discussed the desirability, or otherwise, of introducing wood paving into the city, and, this week, Mr. Parke Neville, the city engineer, has forwarded the members an elaborate report on the subject. In this document he enters at great length into the cost and durability of the various descriptions of wood pavements laid in London streets. He states, as his conclusion, that, although wood pavement is a most pleasant roadway to drive over, and is easily kept clean and watered, yet its real durability has not at present been tested; we know enough, however, to show that its outside life cannot be set higher than from five to seven years; and that, therefore, as compared with a pavement of square setts, it is three or four times more expensive. Mr. Neville does not object to the use of wood pavement opposite churches and hospitals, to deaden sound, but he regards its general use as a most expensive luxury, not suited for adoption until the corporate funds permit the poorer parts of the city to be properly cared for as to road repairs and scavenging. In an appendix, an official report by Mr. Van Nort, city engineer of New York, is quoted. Mr. Van Nort's opinion is extremely adverse to wood paving, which is regarded by him as almost useless when the traffic is heavy. In New York, Mr. Van Nort says there have been a great many kinds of wooden pavements laid, but, so far, all have proved very expensive to lay and maintain; and he thinks it doubtful if any form or preparation of wood can be made or maintained, save at great expense, as all suffer from the same organic defect—speedy decomposition.

The Sunday Society intends to be active during the coming winter. It will be represented at the Social Science Congress, and in one of the departments a paper will be read on its behalf, by the Rev. Robert B. Drummond, entitled "Sunday Reform." During the sitting of the Congress a public conference will be held in Edinburgh, in support of the opening of museums on Sundays; and on the 25th inst. Professor Tyndall will preside over a public meeting, in the largest hall in Glasgow, in support of the Sunday Society.

The Parkes Museum of Hygiene was re-opened last Monday (after the usual vacation) in connection with the introductory *conversazione* of the Medical School at University College. There was a good attendance of gentlemen and students, who manifested much interest in the collection of sanitary appliances, to which several additions have recently been made, including concrete and stoneware goods from the Poole pottery district; Messrs. Tonks and Son have added to their contribution a model of a new ventilator, called "the Architrave Ventilator," designed by Mr. Mark H. Judge for the purpose of making an architectural feature of the provision for ventilation. The Parkes Museum will continue to be open free on Tuesdays, Thursdays, and Saturdays.

An exhibition of art was opened on Monday, at Leek, in aid of the funds of the Leek Art School. Besides the pictures lent by residents of the district—enough in themselves to form a respectable exhibition — the committee have secured a good number from outsiders, and among these are the lenders of Miss Thompson's celebrated "Quatre Bras" and "Balaclava," which are the leading attractions of the gallery. Altogether there are nearly 500 pictures and other works of art on view, and of these 242 are oil-paintings, 47 water-colours; 5 specimens of embroidery, and ten of bronzes and metal-work; a collection of 96 water-colours, illustrating the rise and progress of the art in England from 1710; and 37 original drawings for the publications of the Arundel Society. Among the old masters who have a place are Canaletto, Carracci, Correggio, Gasper de Crayer, Durer, Peter de Hooge, Huysman, Sir Peter Lely, Mytens, Van Ostade, Paul Potter, Rembrandt, Reubens, Ruysdael, Schalcken Jan Steen, Van Stry, Teniers, Terburg, Titian, Vandyck, Van de Velde, and Wouvermans. Among modern painters represented are Miss Thompson, Armfield, Constable, E. W. Cooke, R.A., C. W. Cope, R.A., Etty, R.A., Sir John Gilbert, Gainsborough, Herring, Hogarth, Leslie, R.A., Mason, Mulready, R.A., Sir Joshua Reynolds, Turner, Vernet, Watson, R. Wilson, R.A., Woodforde, R.A., Joseph Wright, A.R.A., &c. Among the general water-colour paintings are productions of George Cattermole, Charles Cattermole, Sidney Cooper, R.A., David Cox, Birkett Foster, &c. The South Kensington Museum contributes largely. The total value of the collection is stated to be £10,000.

The death is recorded of one of the most widely-respected American architects, Mr. Charles Dexter Gambrill, of New York, which took place in that city on Monday, September 13. Mr. Gambrill was born in Roxbury, now a part of Boston, in 1832, his father having been a surgeon in the Navy. He was educated in Boston, and graduated from Harvard College in the class of 1854. After graduation he studied architecture, first in Boston, under Mr. George Snell, and subsequently in New York, under Mr. Richard M. Hunt, and has since continued to practise in New York, at first in partnership with Mr. George B. Post, and later with Mr. Henry H. Richardson. Shortly before his death he had formed a new association with Mr. H. E. Ficken. He was one of the earliest Fellows of the American Institute of Architects, holding various offices in that body, and had long been a prominent member of the government of the Century Club.

The lectures on Architecture and Construction, formerly given by Prof. Donaldson, and more recently by Prof. Hayter Lewis, will be given this years by Mr. T. Roger Smith, who has lectured for the last two sessions. Mr. Roger Smith's lectures on Professional Practice will also be repeated this session, beginning on Monday evening, the 25th inst. The class for the study of this subject met for the first time last session, and both the attendance and work done were very encouraging. Any student desirous of hearing a single lecture in either of these classes can be admitted as a visitor on applying to the attendant at the College.

On Wednesday, at the Shire-hall, Hertford, Lord Lytton opened the Herts County Fine Arts Exhibition. The loan collection is valuable and interesting, and includes many articles of great beauty and antiquity, some of which were collected in India by Lord Lytton. There are water-colour drawings by eminent masters, ancient needlework, bronzes, Indian, Chinese, and Japanese work in gold, silver, ivory, stone, and wood, and ancient tapestry, &c., exhibited by the Marquis of Salisbury, from Hatfield-house; Earl Brownlow, Ashridge-house; Earl Cowper, Panshanger; and the Earl of Clarendon. Mr. John Evans and Mr. Robert Hanbury also contribute to the collection. In the art department upwards of 200 drawings are exhibited for competition. The art-needlework department gives evidence also of skill in design and execution. The prizes awarded in these sections will be presented to the successful competitors by Viscountess Grimston in the Corn Exchange to-day, when the Earl of Verulam will preside, and a School of Art for Hertford will be constituted. The exhibition closes on the 12th inst.

A movement is in progress in the west of London to induce the Metropolitan Board of Works (in the Bill for which it is expected the requisite Parliamentary notices will be given next month), to provide for a new and wide street, from the Cadogan Mansions, in Sloane-square, to Sydney-place, Onslow-square. The road from Buckingham Palace down to Eaton-square and Westbourne-place into Sloane-square is wide and perfectly straight, but the proposed new thoroughfare, commencing from Sloane-square, would have to pass through and in part demolish the existing Symon's-street, corner of Lincoln-street, Cumberland-place, the south ends of Marlborough-road and Keppel-street, College-place, Cale-street, and Pond-place. The access from the Fulham-road and Chelsea to the portion of the Thames Embankment at Chelsea is known to be miserably inadequate, and it is also felt that the long disused churchyard of St. Luke's, Chelsea, might, under a faculty from the Bishop of London's Court, be with advantage converted into an agreeable pleasure-ground for the people, and that from the proposed new thoroughfare a handsome avenue might pass immediately on to the Embankment by utilising a strip of the vacant ground at the back, or east side, of St. Luke's Church, Chelsea. If the section of Chelsea, lying between Sloane-square and Onslow-square could be judiciously opened out, building sites of great value might be obtained, and, at the same time, much larger and improved accommodation could be provided for the industrial classes so largely employed in the West-end.

An Exhibition of Gas and Electrical Apparatus was opened at Glasgow last week, and is exciting considerable attention. The Messrs. Crossley exhibit an "Otto Silent" and Bisschop gas-engine; Mr. Keith, of Edinburgh, sends a neat little hot-air engine, worked either by coke or gas, and also exhibits his "gasworks" for making illuminating gas from mineral oil, an apparatus that has been adopted by the Commissioners of Northern Lights for manufacturing gas to drive engines in connection with the fog-signals, &c.; Dr. Adam shows his patented stove for cooking by gas, and Messrs. Bruce, Peebles, and Co. exhibit gas-governors. Bray's and Sugg's burners, Cowan's meters, and Mr. Young's (Belfast) leakage-detector are prominent exhibits.

CHIPS.

A memorial statue of the present Earl of Devon is to be unveiled at Exeter to-day (Friday). It has been executed by Mr. Stephens, of London.

In his annual statement as to the operations of the London School Board, Sir Charles Reed, M.P., said, on Thursday week, that during the past financial year tenders were accepted by that board for 24 new schools, accommodating 21,751 children. The average cost per head on these contracts was £8 18s. 5d., a sum which included the provision of teachers' rooms, schoolkeepers' houses, boundary walls, and in several cases extra deep foundations. The total Board-School accommodation provided in the metropolis up to midsummer of this year was for 262,259 children, and the sites occupied a total area of 151 acres.

A stained-glass widow, designed and executed by Messrs. Gibbs and Howard, has been placed in Hurstmonceaux Church. The subject is Christ healing the sick.

A series of street tramways are being laid in Cambridge for a local company. Mr. T. Floyd is the engineer, and Mr. J. F. Meston is the contractor; the work will be completed in a few days.

Mr. J. Collinson Bruce, LL.D., of Newcastle-on-Tyne, a well-known antiquary, and the author of a standard work on "The Roman Wall" and other books relating to the Roman occupation of Britain, has been nominated to the moderator's chair of the English Presbyterian Church for 1881.

A new Baptist chapel was opened at Sandhurst, near Aldershot, on Wednesday week. It seats 150 people, and has been erected from the designs of Mr. Ranger, of Finsbury Pavement, E.C., by Mr. James, builder, of Sandhurst.

At the last meeting of the select vestry of Richmond, Surrey, the designs of Messrs. Elkington and Son, of Cannon-street ("Natation"), as modified and reduced, were finally adopted, and the baths committee were authorised to carry them out at a cost not to exceed £4,000. Thus ends the "dreadful disappointment."

The Metropolitan Board of Works will proceed to-day to the appointment of two district surveyors for north-west and south-west Islington, till recently held as one district by the late Mr. Moseley.

A new set of farm-buildings are in course of erection at Barrington for Mr. Edward Rhys Wingfield, of Barrington Park. The architect is Mr. J. C. Wiglesworth; the contractor Mr. Alfred Groves, Milton-under-Wychwood, Oxon, and the cost about £2,800.

A new market-hall and offices are in course of erection at Maesteg, South Wales. Mr. Harris, of Cardiff, is the architect, and Mr. George Thomas s the contractor.

The rebuilding of Mount Stuart House, the Bute Island residence of the Marquis of Bute, is making steady progress. The foundations of the new structure have just been completed and cover a larger area than the former building. Three powerful steam cranes have already been erected on the site and two others are in course of erection. About 300 men are at present employed on the undertaking, but it is expected that after the New Year regular work will be found for 500 hands—local men being preferred if found capable. The contractors are Messrs. Watt and Wilson, of Glasgow, and the undertaking will occupy another five years.

The Water Commissioners of Belfast are about to carry out expensive works of additional water supply at Lower Woodburn, including reservoirs and conduits to the city. Mr. L. L. Macassey, C.E., of Belfast, is the engineer of the scheme.

An additional line of siphon pipes is about to be carried across the valley of the Duchray, about five miles west of Aberfoyle, on the line of the great aqueduct from Loch Katrine to Glasgow. The new siphon will consist of about three-quarters of a mile length of 42in. cast-iron pipes, with lengthy approaches on either side. The works are to be carried out for the Water Comissioners of Glasgow Corporation, and from the designs of their engineer, Mr. Galo, of Miller-street, Glasgow.

The Camberwell Vestry received last week a report from the sanitary committee suggesting the desirability of obtaining a depôt for the deposits of dust from ashbins. It was stated that the vestry for the past two years had removed refuse from houses themselves at a cost per annum of almost exactly £2,000 a year, or about 2s. 6d. per load. In 1877 and previous years, under the old contracting system, the cost was about 5s. 6d. per load, and in the year of the change, 1878, the lowest tender received for the work was that of Mr. Reddin, which was £3,400, more than £1,400 beyond the ultimate cost to the vestry. The report was adopted, and the committee were empowered to negotiate for a depôt.

On Thursday week the roof-rearing supper to the artificers and employés at the Sheffield New Corn Exchange Buildings was given. Mr. Charles Hadfield (of the firm of M. E. Hadfield and Son), presided. A similar entertainment took place at Leeds for the workmen engaged at the extensive establishment of Messrs Tomlinson and Son, the contractors, where the oak roof for the New Corn Exchange and the joiners' work are being executed. Mr. Tomlinson gave some interesting details of the quantities of materials in the building, remarking that amongst the rest upwards of two-and-a-half millions of bricks, 150 tons of oak timber, and 200,000 Broseley tiles had been supplied up to the present time. The health of Mr. Payne, the clerk of the works, was given and duly acknowledged: while the toast of "the Foremen," by the Chairman, was appropriately replied to by Mr. Teale, the senior foreman.

The workhouse schools at Pontefract have just been altered and enlarged from the designs and under the superintendence of Mr. Malcolm, the architect to the board of guardians.

That portion of the Tuileries which escaped destruction at the hands of the Communists, the Pavillon de Flore (illustrated in one of Mr. Giraldon's sketches a fortnight since) caught fire on Saturday night, and alarm was created as the wind blew in the direction of the Louvre. The fire, which is supposed to have broken out in the caretaker's rooms, was extinguished, but not until the second story had been almost burnt out.

A new Masonic hall has been built and opened at Rushmills, near Dublin. The honorary architect was Brother W. A. Traill, C.E., chairman of the committee.

St. Stephen's Church Schoolrooms, Sulby, near Ramsey, Isle of Man, were reopened on Friday week, after rebuilding. Mr. Thomas Walker was the architect, and Mr. Kelly, of Michael, the contractor.

◆

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◆

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Anerley, S.E.—For alterations and additions to "Fern Villa," Anerley-road (Palace Brewery), for Messrs. Edie Bros. Mr. Joseph S. Moye, architect:—

Saala, Henry	£867	0	0
Marr, Robert	720	0	0
Fox, William	695	0	0
Hollidge and Stuart (accepted) ...	687	0	0

Bognor.—For the erection of four houses at Bognor, Sussex, for the Bognor Hotel and Residences Company, Limited. Mr. G. Gard Pye, architect, Colchester, and 32, Bedford-row, W.C. Quantities by Mr. C. Stanger:—

French, C., Lisson-grove	£5,425	0	0
Nichols, W. F., Brockley, S.E. ...	4,976	0	0
Lissaman, W., Leamington ...	4,813	13	4
George's road, S.E.	4,677	0	0
Longley, J., Worth...	4,599	0	0
Ennor, Julians, and Co., St.			
Smith, A., Bognor	4,540	0	0
Everett and Sons, Colchester ...	4,400	0	0
Huey, G., Parkstone	4,376	0	0
Garrod, J., Spitalfields	4,083	0	0
Bull, R., Chelsea	3,995	0	0
Cooper, W. H., Slinden-common	3,559	0	0
Vaughan, E., Acton...	3,438	0	0
Lacy, W. R., Westminster ...	3,300	0	0

Bray, Co. Wicklow.—For works of kerbing, &c., for the town commissioners. Mr. Comber, engineer;—

Brady, Bernard (accepted)	£251	0	0

Bray, Co. Wicklow.—For building a retaining-wall at the docks for the town commissioners. Mr. Comber, engineer:—

Dixon, G., of Dalkey (accepted) ...	£65	0	0

Bristol.—For altering and adapting premises in Rupert-street, Bristol, for printing and publishing offices for Messrs. J. Wright and Co. Mr. Herbert J. Jones, architect:—

Saville (accepted)	£516	0	0
For new concrete floor:—			
Williams (accepted)	£73	0	0
	589	0	0

Bristol.—For alterations at No. 17, Small-street, Bristol, for Messrs. R. B. Javery and Co. Mr. Herbert J. Jones, architect:—

Saville	£431	0	0
Johnson	390	0	0
Krauss (accepted)	380	0	0

Bristol.—For alterations at No. 12, Bridge-street, Bristol, for Messrs. Wm. Summers and Co. Mr. Herbert J. Jones, architect:—

Estabrook and Sons	£910	0	0
Humphreys	888	0	0
Passeo	804	0	0
Cowlin and Son	779	0	0
Beaven	740	0	0
Krauss (accepted)	720	0	0

Bristol.—For restorations at Roseville, Sydenham-hill, Bristol, for Eustace Bulton, Esq. Mr. Herbert J. Jones, architect:—

Johnson (accepted)	£110	0	0

Deptford.—For building 22 and 23, Evelyn-street, with shop, bakehouse, stabling, &c., for Mr. J. J. Pitt. Mr. Henry Roberts, architect and surveyor, 3, Sandfield-terrace, Lewisham-road, S.E.:—

Mr. F. Glock, Deptford (accepted).

Edgware.—For erection of lodge, stables, and cow-house buildings, Edgware. Mr. James George Buckle, architect. Quantities by Mr. Charles L. Cadney:—

French, Charles	£2,295	0	0
Harries, James	2,195	0	0
Childs, C. J.	2,169	0	0
Sawyer, J. W.	2,136	0	0
Donne, J. P.	2,125	0	0
Holloway, James	2,050	0	0
Parker, George	2,000	0	0
Hussey, William	1,956	0	0
Awgood, James	1,890	0	0
Evans, R. and E.	1,890	0	0
Beale, W. J., Battersea (accepted)	1,650	0	0

Greenwich.—For bringing out seven shops, Mount-pleasant, Lewisham-road, for Mr. Luck. Mr. Henry Roberts, architect and surveyor, 3, Sandfield-terrace, Lewisham-road, S.E.:—

Mr. H. F. Todd, Greenwich (accepted).

Guildford.—For making-up Dapdune-road and Markenfield-road, for the Guildford Town Council. Mr. Henry Peak, borough surveyor;—

Swayne, T.	£256	0	0
Patrick, W.	230	0	0
Burdett and Son (accepted) ...	225	10	6

Hastings.—For painting and plumbing works at the borough cemetery chapels, for the town council:—

Hide, C. S., Old London-road (accepted)	£54	10	0

[Lowest of six tenders received.]

Hastings.—For the supply of about 1,500 yards of fencing at the Park, for the town council:—

Main and Co., of London (accepted) 10s. 3d. per yard.

Inverness.—For the erection of an iron foot-bridge across the Ness, midway between the present suspension bridge and the old wooden bridge:—

Northern Foundry Co. (accepted)	£1,950	0	0

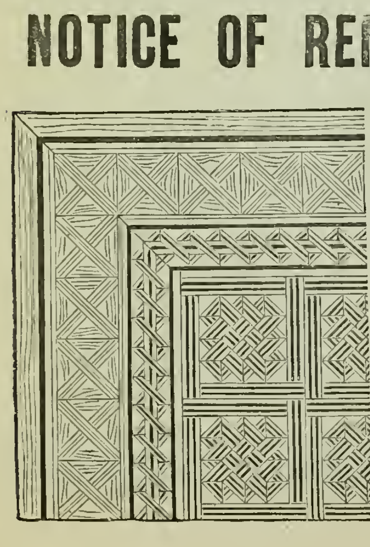
Lambeth, S.E.—For the enlargement of the South Lambeth-road School by 400 places, for the London School Board. Mr. E. R. Robson, F.S.A., architect to the Board:—

Dows, W., ...	£4,329	0	0
Kirk and Randall	4,276	0	0
Braid and Co.	4,203	0	0
Thompson, J.	4,171	0	0
Shepherd, W.	4,096	0	0
Nightingale, B.E., ...	4,073	0	0
Chappell, J. T.	4,059	0	0
Tyerman, J.	4,042	0	0
Higgs and Hill	4,018	0	0
Grover, J.	3,994	0	0
Jerrard, S. J., of Loampit Vale, Lewisham*	3,824	0	0

* Recommended for adoption.

This school was not planned for extension, and the tender includes the cost of rebuilding the w.c.'s for the entire school, necessary to make room for the enlargement. Cost of (*a*) School buildings only, £3,065; (*b*) Tar pavement, playground and drains, £189; (*c*) Teacher's room, £100. For special expenses:—(*d*) Special works to present school, £93; and (*e*) Rebuilding w.c.'s for entire school, £377: total, £3,824. Cost per head of (*a*) and (*b*), £8 2s. 8d.; total cost per head, £9 11s. 2d.

NOTICE OF REMOVAL TO 51, CLERKENWELL ROAD, E.C.



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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 15, 1880.

THE PRICE OF ARCHITECTURE.

I.—In Time.

A MULTITUDE of reasons have been given by different writers to explain why modern architecture does not improve more rapidly. One critic thinks the evil lies in not copying ancient work closely enough; another feels sure it would cease if we cut ourselves adrift from ancient work altogether; while a third goes a step further, and has not the slightest doubt that architecture would grow up of itself, if he could only get rid of all architects. A writer on this subject is nothing if not paradoxical; and speculations which, if they belonged to science, would be scouted as absurd on the face of them, find a place in respectable periodicals when they only deal with art. This fact at once shows how little the arts, including architecture as the chief of them, are really understood or cared for by the public at large. And here we come upon a main reason why they do not flourish more. As regards architecture in particular, the public do not—and, generally speaking, probably will not—pay the necessary price for it: either the price in time or the price in money. We need look no further to ascertain why its progress is comparatively slow.

To know what is the price of real architecture in time, we have only to remember the time occupied in building our ancient churches and monasteries—those portions of them, namely, which were built consecutively, and without any abrupt break in style. It would hardly be an exaggeration to say that works of this class then took as many years as they now take months. Even when building went on continuously, it is the commonest thing in the world to find that some such structure as a cathedral choir was ten, twenty, or even thirty years in hand; it is quite the exception, indeed, to learn that the building went on faster. At this rate, there was ample opportunity to consider every detail. Features inherited from the past could be thought over and cautiously improved, while new forms could be modelled, experimented on, and subjected to the general criticism, before they were permanently embodied in stone. The successes of architecture in its golden age were the result of no magic: they were the natural reward of cultivating art under the right conditions, and if we could only secure the right conditions again, we might succeed as well. First of all, architectural artists were united. Instead of illustrating, as our profession in modern times illustrates so ably, the worse side of the fable about the bundle of sticks, they held to one another and to their art through every difficulty, and thus, instead of having conditions dictated to them, they themselves dictated the conditions on which alone they had found that architecture could be successfully practised. Among the first of these conditions was evidently time, so that a hurried building seems to have been a thing almost unknown in the better part of the Middle Ages. And yet, if time was the most pressing of all wants then, it is a still more pressing want now. In the Middle Ages, buildings were of few kinds: each kind followed, in the main, a well-known type, and in planning and composition, as distinguished from detail, the artist's chief business was to refine this type and bring it nearer and nearer to perfection. Now, on the contrary, our buildings are of kinds almost innumerable. For most of them there is no established type, or, if there is, it is too often a type which needs to be disestablished, and the sooner the better. The architect must begin at the beginning, and think out the very elements of each problem for himself. He has no guide, except the failures of his contemporaries; no chance of making experiments as he goes on, for he is compelled to predict beforehand all that he means to do, in order to get it contracted for at a lump sum; and, worst of all, he has no time either to think or experiment in. His first ideas have to be his last; and he is bound down by custom, by his clients, and by all the conditions of modern life, to build in haste and repent at leisure.

To those who know, as every practical architect does know, the truth of this description, it is not at all surprising that our secular buildings do not show a higher class of design. Here, where there is most need of original study, all things conspire to make that study impracticable. In places of business, delay means loss of money; and everything that hinders bricks from being laid and stones from being set as fast as hands can move them, is called delay. To put up something as showy as possible, as quickly as may be, is usually the client's all-absorbing passion; and woe to the architect who stands in its way. Here is one plain reason for the ugliness and vulgarity of our streets: not, indeed, a full excuse, but a tolerable explanation of it; and there is something ludicrous in observing one infallible adviser after another, as he misses this most palpable evil, close under his eyes, and searches miles away for some previously unheard-of cause why architecture does not flourish. The real causes are too obvious, too simple, too clear, to make a sensational article about; and it is the unfortunate habit of writers on this subject to care far more about being sensational than about being trustworthy. Pugin set the bad example of criticising architecture, so to speak, in a scream; Mr. Ruskin, with a far more tuneful and more powerful voice, followed at the same unnatural pitch; and since then, every writer, from the most accomplished historian of art down to the smallest Right Honourable lecturer, feels bound to give us his opinions in *falsetto.* To anyone who is bent on thus acting the Hero as art-critic, on o'erdoing Termagant, and out-heroding Herod, it must be distasteful enough to trace effects to their real origin. To show that one main reason for the difference between ancient and modern architecture lies in the undeniable fact that the ancient architects had ten times as long to study their work in as the modern ones, and twenty times as many opportunities of experimenting on and perfecting it before it was finally fixed, would be to throw away a multitude of excuses for virtuous indignation and a thousand chances of displaying the writer's rhetoric at the cost of his veracity. A journal like this, however, has to do far less with rhetoric than facts. To its readers, architecture is a subject for serious study, not a mere theme for an exercise in eloquence. If the causes which hinder the revival of their art can be found and even partially remedied, they will feel a deeper interest in the matter, we may assume, than in the most forcible vituperation of either individuals or classes; and hence, though the statement may sound tame enough after the screaming criticism to which we are now accustomed, we venture to assert that one great cause of the inferiority of modern to ancient art is want of time.

In the golden age of art, competitions were almost, if not quite, unknown. Now, nearly every architect who hopes to succeed has to spend great part of his time in designing buildings which he will never execute. The public fancy that competitions afford the best prospect of obtaining good architecture; but in point of fact every competition lowers the *general* level of art in many ways, even if the accepted design is not below that level. What competition committees usually do, is to get the hasty thoughts of many architects instead of the deliberate advice of one. The only redeeming point in competitions is, that they sometimes give a man a chance of putting forward some matured idea about a particular class of building, which he has been thinking over for years without the opportunity of applying it. But from the nature of things it can rarely happen that such an idea is at once and easily applicable to the particular case that has then arisen. The idea wants adapting, and time is wanting to adapt it in—even more time, in the case of a new idea, than of an old and well-worn type. Moreover, sites and money and required accommodation vary so, that it is little more than a general idea which *can* be thought out beforehand. An architect may consider himself very fortunate who can fittingly use so much as a general plan and scheme of composition for a building for which it was not specially prepared. As to working out detail beforehand, it is flatly out of the question; and it is detail which takes up by far the greater part of the modern architect's time. Here, again, we come on a still further cause for hurry. The architects of the Middle Ages (and if anyone can so far suppress his common-sense as to doubt whether architects then existed, let him turn to the appendix of Mr. Street's work on "Spain,") clearly designed, and were responsible for the general scheme of their buildings. This was their own work, and it is this which gives unity in the midst of all the endless variety of every great Gothic church. But, the general scheme once settled, a multitude of the details must have been left to subordinates. The architect did not design them, unless so far as to suggest their general forms, though he doubtless controlled them, and took good care that they should all tend to develop, and not to frustrate, his grand idea. Now, on the contrary, the architect must design everything. Not a detail, however small, can, as a rule, be left to any workman, and even the carver, whose work is least mechanical, and therefore least fit to be invented by any but the man who executes it, requires sketches before he can do anything harmonious or satisfactory. How utterly incapable most modern workmen, even of what should be the most artistic class amongst them, are of aiding the effect of a building when left to themselves, may be seen by anyone who walks about London with his eyes open. Some twenty years ago Mr. Ruskin carried his doctrines to their logical conclusion, and announced that there was no such thing as architecture apart from sculpture. He finally stated, in fact, that sculpture, and sculpture alone, was architecture, and that there was no other architecture worth notice. A good many persons, who may be described as architects whose education had been neglected, took him at his word, and put his preaching into practice. At that time, even more than at present, it was this class of persons into whose hands the designing of our street-buildings chiefly fell; and, therefore, it is our streets rather than our churches which show the result of their experiment. Faithful to their great leader's teaching, they troubled themselves little enough about proportion, composition, or what had previously been known as architecture proper. The great thing was to give the "art workman" a field for his talents, and this they certainly did. An elevation, with them, was a wall of rough freestone, to be made into architecture by turning carvers loose on it. The carvers carved it at their own sweet will; they brought their stock patterns from Notre Dame, Paris, from Chartres, from Wells, from Salisbury, and stuck them by the mile over City shop-fronts and warehouses. Now and then they went to Nature, and repeated it without the life; a feat much glorified when the Oxford Museum was built. And the result of the whole is that the street-buildings on which the process was tried are about the most sickening to contemplate of any which the world has seen. The architect, as we have said, effaced himself, and this was bad enough: but the carver exhibited himself, free and uncontrolled, and this was worse: and when the exhibition shall at length terminate, as it seems now to be on the point of doing, we devoutly hope it may never take place again.

In this matter of time, therefore, the difference between the ages when architecture flourished and the present age seems to be as follows. Then it took twenty or thirty years to build part of a church; now it takes two or three years to build a whole one. Then the architect only had to invent the general scheme and composition; now he has to make drawings for every detail down to the smallest. Then he only had to deal with some half-dozen species of buildings, every species of which had a customary form, found by experience to be good in the main, and only needing to be further refined, improved on, and adapted to the special features of the case; now he has to deal with countless species of buildings, many of them never dealt with by anyone before him. Then all his time could be given to the building he was actually at work on, and engaged in superintending; now a great part of his time has to be spent in competing for buildings which he will never have anything to do with. As the sum of it all, he needs, if his buildings are to bear comparison with ancient ones, to give as much thought to the perfecting of each new species which he deals with as generations of men, one after the other, had given to the perfecting of the Mediæval type of church or hall; and in addition to this he needs afterwards to give all the further thought which all the subordinate artists employed on each ancient building gave to it. The task set him is to do the thinking of twenty generations, and of fifty men, at least, in each generation, and the time allowed him to do it in is, perhaps the tenth part of what was allowed to each one of these men over a similar building. How strange that modern architects do not always do something fresh! How singular that they do not strike at new styles, and display invention and originality at every turn! How shameful that they should ever employ assistants, even assistants as well qualified as themselves; when all that is expected of them is to do, each one, the work of a thirteenth-century architect and all his subordinates; to strike out at once, by inspiration, ideas as good as those which the thirteenth-century architect and his predecessors evolved by the slow labour of centuries: to get their works designed and built in about as many months as the said architect took years, and concurrently with each work in hand, to make drawings for a good many works which they never will have in hand, with the penalty, in case of failure, of getting no more work to do. Or is not the shame rather on the other side—and should it not fall on those who, knowing better, seek to persuade the public that they can have architecture without paying its price; who, conscious of being unequal to the gigantic difficulties of the modern architect, do not try to help in his work; but whose sole idea of the noble, the wise, and the heroic, is to stand by, abusing and maligning all who bear the burden and heat of the day?

THE LIVERPOOL CONSERVATIVE CLUB COMPETITION.

LIVERPOOL has, within the last three or four years, given its attention to clubs. The movement was started by the inauguration and erection of the Reform Club in Dale-street. The Conservatives took the hint from their rivals, and are acting upon it, with the result which we now chronicle. As stated in our last issue concerning this competition, 27 architects sent in plans, amounting in all to upwards of three hundred drawings. The conditions state the competition to be limited to architects professing Conservative politics, and having an office in Liverpool. The site fronts Dale-street, and is nearly 100ft. square, three sides facing streets, the fourth or south-east side abutting against neighbouring buildings, consequently without light. Views and plans are all to one-eighth scale, and a fixed point is given from which to take perspective. Roughly, the accommodation required was—in basement: offices let to Constitutional associations and club cellars; ground-floor, reception-room, morning-room, and library, and a note is made for more than ordinary provisions for lavatories, &c. The first floor to comprise coffee-room, smoking-room, stranger dining-room, luncheon-room, and private dining-room. The second floor comprises billiard-rooms, and the upper part of building kitchens, larders, &c. An external building for addressing meetings was also suggested. The drawings are well exhibited in the Stock Exchange buildings. The list of competing architects is as follows:—

Aldridge and Deacon.
Banner, E. H.
Barry, T. D., and Son.
Bradbury, G.
Bromilow and Cheves.
Clarke, Jno.
Culshaw, Alfred.
Carroll, G. E.
Doybry, James.
Ellison, C. O. (Colonel.)
Fry, H. and A. P.
Grayson, G. E.
Gregory, V., & J. N. Crofts.
Hartley, Hy.
Holme, Messrs. F. and G.
Hoult and Wier.
Hornblower, F., and Sons.
Hesketh, W.
Mercer, T.
O'Byrne, J.
Reeve, J. E.
Shelmerdine, Messrs. E. and H.
Smith, Messrs. A. & A. W.
Sykes, R. G.
Sherlock, G.
Thomas, W. W.
Walker, David.

The design to which the first premium of £100 has been awarded, that by F. and G. Holme, certainly deserves its pre-eminence. The arrangement of putting the entrance at the side of the front elevation affords excellent play to the disposition of the frontages. A large entrance-hall leads at once into reception or cloak-rooms, and to the central staircase hall. The service entrance on this floor is also good. On the first-floor, an L-shaped coffee-room, 95ft. long, runs along one side of the building, the short side of the L being the stranger's luncheon-room. Fault must be found with the service-room, which is too small, and should include the plate-room. The basement in part is dark; note the stairs from it to the club. Leaving the basement for the street, we find ourselves next to the club grand entrance. In election times, the nuisance of a crowd of messengers by a club-entrance would be intolerable. The style of architecture is Italian, with Pavilion roofs. The balcony angle with more study would make a graceful composition; less heavy chimneys might prove advantageous. There are 710,000 cubic feet in this design, and the author's estimate of cost was £28,100.

Second prize (£75) C. O. Ellison, exhibits careful study in arrangement, and excels in all what may be called the machinery of the club, such as rooms for outside waiters, good service rooms, having the various dining-rooms well in reach. The general grouping of the large rooms is satisfactory; but it is somewhat surprising to find dressing-rooms with borrowed lights, w.c., and larder in the centre of the building, and scullery only 18ft. 6in. by 14ft. 6in.; this latter may have been crushed into small dimensions by a desire to bring down the kitchen accommodation from the third to the second floor. In the perspective view, the design is dwarfed by the prominence given to neighbouring buildings. It is difficult to give a name to the style of this design—perhaps Queen Anne might serve; still, with the attempt to group with more purity of style, an effective elevation might have been the result. Compared with most of the others, this design, like the first prize, has low rooms, that is, the coffee-room, 78ft. by 33ft., measures some 17ft. from floor to floor. Small cubical area is the result, viz., 645,000 cubic feet, and cost £26,875.

The third prize (£50), G. Bradbury, comprises two sets of plans, Nos. 1 and 2, the latter with alternative elevation. No. 1 in a well-tinted view shows the best elevation, and the style reminds one of the St. Stephen's Club, Westminster. No. 2 plan is the better in arrangement; ground-floor lavatories too far back from front, library in the noisy street. A fine coffee-room stretches the length of the principal street on the first floor, and with the smaller dining rooms is grouped well with the serving room. The etching of the two perspectives of this design is very good, and displays the building in Italian style. The cubical contents of this design are 776,502ft., and the cost £32,354.

G. E. Grayson follows close to the prizes, bringing to his aid his experience from the City Liberal Club in making his well-considered plans. The principal or coffee-room floor develops well, service being ample and well situated. Elevations quiet (rather effeminate) Parisian Italian; illustrated by a well-etched perspective. One of the best got-up set of plans belong to J. Doyley, position of entrance resembling that of first prize, the general allotment of main rooms good, but service bad. Italian elevation well carried out in side streets. View shown by a fair-etched drawing.

Alfred Culshaw gives a contrast in dismal inartistic drawings (but club-like withal), and containing less cubical contents than any other of the plans. And J. O'Byrne, with cubic economy, reports the lowest expenditure of any. Nearly the whole of the remaining designs have been too liberal for the committee's requirements in the size and number of their rooms; some, including basement, reaching six stories high in elevation. C. Sherlock spoils a well-balanced Classical design by a badly-arranged plan, placing coffee-room 89ft. 6in. by 31ft. 6in. at the back, lighted only at the ends by side streets. William Hesketh, in excellent drawings, produces the most stately arrangement of hall and staircase in the competition, but thereby loses in economy of space. A good perspective displays a Classical design.

H. and A. P. Fry send good drawings; the principal entrance is too narrow, and lavatories inconveniently placed. The coffee-room arrangement appears similar to Conservative Club in Manchester. Perspective artistically coloured.

Aldridge and Deacon, like the preceding, suffer by not giving sufficient importance to the entrance. The elevation is bold, the balcony window badly managed, but the whole is made to look well by a broadly-etched perspective.

Hornblower and Son give much labour to their plans, and D. Walker sends good drawings, but faulty as to light in centre of building and service.

There is a billiard-room with two tables, only 6ft. apart. Without making further selection of names, may call attention to several of the remaining designs, as being distinguished by more than ordinary neatness and care in their execution. In conclusion, although some well-known local names do not enter the list, the exhibition is creditable to the architects of Liverpool. The points where most of the competitors have erred are the following:—1st. Much valuable ground-space has been lost by making too large a reception-room; perhaps the conditions might have been more explicit had it been called waiting-room. 2nd. Sufficient attention has not been given to the dignity of the entrance-hall. 3rd. The requirements and necessities of the service, in connection with the dining-rooms, and also the arrangements of the kitchens, &c., as to size, have been generally neglected. Again, the majority have fixed upon about 21ft. for the principal rooms from floor to floor, whereas the winning plans have adopted about 17ft. for the same rooms from floor to floor, thus gaining a material advantage in cubing up the cost. Whilst mentioning this, we should advise a reconsideration of Mr. Holmes' heights, for the sake of dignity, of his bedrooms. Excepting two inferior Gothic elevations, those exhibited affect either a Renaissance or Italian treatment of style, in order to harmonise with the adjoining municipal buildings; and with the exception of one or two, as already pointed out, the elevations are not above an average character in design. The prizes were awarded by Mr. Waterhouse, the assessor, and the committee have coincided with his decision, which has given general satisfaction.

THE TURNERS' EXHIBITION.

LAST Tuesday, the tenth annual exhibition of the Worshipful Company of Turners was opened at the Mansion House, and the display of specimens was quite equal to that of former years. The exhibition includes three sections of work, namely, handturning in wood, in ivory, and precious stones, including engraving in intaglio. In the specimens of turning in wood, both hard and soft wood, we find many of the exhibits show capacity for the higher qualities of design. In awarding the prizes, the judges have taken into account various qualities, such as beauty of design, symmetry of shape, fitness for intended purpose, ability to turn circular or oval in both classes of wood, novelty and general excellence in workmanship and finish; but though these qualities were categorically stated, the competitor was left to make his own selection. The names of the judges in wood-turning are Mr. J. J. Holtzapffel, A.I.C.E.; Mr. C. H. Gregory, C.M.G., past-president Inst. C.E.; Mr. H. Law, and Mr. E. R. Robson.

Making our own observations on the merits of the specimens, we think the judges have judiciously bestowed the two chief prizes, though in the numbering of the others we take exceptions to the order. To begin with the first prize—the Silver Medal and Freedom of the Company and City—the winner, F. Nickolay, 43, Rupert-street, Haymarket, has produced a pair of unique vases in ebony, relieved by ivory and a bright yellow-coloured wood. The design consists of a tall oviform body, with fine base and neck; the handle and mouth are extremely elegant in outline, and for symmetry and excellence of workmanship the work is not to be surpassed. The second prize (a bronze medal, and Holtzapffel's volumes of "Turning and Mechanical Manipulation") has been given to John S. Coulson, of Thirsk, for a pair of vases and card-dish. The vases are of good outline, and are turned in acacia, a rich yellow-grained wood, in which are inlays of purple wood in the form of oval medallions in the body of the vase. Round the base, a ring of the same dark wood is inserted, with small dots between the lines of inlay. These inlays are in good taste, and are all hand-turned by the lathe; the oviform medallions admirably fill up the body of vase, and the margin of circles and dots are rich and effective as a decoration. In point of design, these vases equal the first. The third prize goes to Thos. Macdonald, of Millwall, for a pair of carved vases in ebony, walnut, and white wood. The shape of these is heavy; the body of vase is set too close to the base. The winner of the fourth prize certificate has produced a far more creditable design in the shape of an ebony urn, a chastely outlined form, of Etruscan type; the artist is Ansel Leo, of Canonbury. It forms an elongated-shaped vessel, a pointed oval in plan, with well-shaped handles, and the whole is turned. Mr. E. Freeman, Marylebone, wins another prize for a pair of ebony vases, relieved by lighter wood. The oak tray is a clever specimen of hand-turning and design; the tray is about 18in. diameter, and is turned in segments put together; the rim thus formed is pierced by trefoils in circular discs, and a painted china bowl forms the centre dish.

We notice on the tables several other specimens of wood-turning of extreme accuracy, many of novel design. The tazza and cups signed "H. T.," with branches in white wood; the tobacco-stand by W. Arnold, of Coventry, in white and black woods; and the centre flower-stand and two vases in white deal, inlaid with rose-wood, are highly creditable to their makers. The work of W. Gleeson, of Cardiff, who gets the 9th prize, is deserving of a higher reward. His clever mahogany turned candlesticks claim attention for ingenuity of handling and design, and show what a clever artist can do by eccentric turning to produce variety. The candlesticks in one case have square stems, each side of which is enriched by cutting away portions with the lathe, every part being produced by shifting the object. The eccentric patterns produced in this way are marvellous, and, as an example of dexterous manipulation, it shows to what a variety of purposes the lathe can be put. Another pair is even still more novel and artistic: the foot of candlestick is circular, but the upper part is enriched by a series of cuttings or half-circles; the stem was also adorned by eccentric cuttings. The boxwood and mahogany vases are good specimens, but not so striking as specimens of exact copying; yet all the works are highly creditable.

Passing to the ivory hand-turning, we observe a few wonderfully clever feats of workmanship, but in which mechanical manipulation is the uppermost merit. Exceedingly expert, for instance, must have been the manipulator of the ivory-turned cups and glasses in miniature, exhibited in one of the side-cases. So thin and delicately turned are these specimens, that they are almost as transparent as the finest china, and we must look upon them as examples of what the lathe can do with highly skilled hands. We look in vain for any artistic work in this class, however, and the judges have not found a competitor worthy even to receive the first prize. The second prize has been awarded to a pair of ivory cups, by John Hegley, Hoxton; and the third has been taken by G. Freeman. In the wood-turned specimens we notice a few balusters, by T. McErie, of St. John's Wood; some others under motto, "Truth," and a jewel-casket in oak, sycamore, and rosewood, by B. Leach, of Leeds, all creditable specimens of the art. The table of materials used in turning is an interesting and instructive addition to the exhibition; we here see every substance, vegetable and animal, used by the turner—king's wood, cocoa wood, satin wood, box, rosewood, ebony, tortoiseshell, vegetable ivory—and these are turned in the rough.

The works in precious stones command, as usual, a large number of admirers. These are divided into four classes, beginning with rubies, sapphires, emeralds, topazes, and crystals, and finishing with diamonds and brilliants. The highest prize in Class C (silver medal and Freedom) was awarded to Louis Islar, of Oval-road, Regent's-park, and the bronze medal and £5 to Renter and Warner, of Wardour-street. Alexander Wallace's manipulation earns a bronze medal; the work of F. Vincent Abertoldi, City-road; and the horological specimens sent by S. Warwick (Islington), R. T. Claxton (Clerkenwell), well deserve recognition. J. Brown, New. Southgate, takes a bronze medal for some excellent cutting in rock-crystal, topaz, &c. The Brazilian-crystal specimens sparkling with facets, and the small crystal dishes and basket in one piece of rock-crystal, with movable handle, are beautiful examples of symmetry and accuracy of cutting and brilliancy of finish. In the class of seal stones, such as garnets, turquoises, onyxes, the designs are various, but we cannot admire the taste in the crystals adorned with heads of dogs and other comicalities. In the award of the prizes to these classes, the court possessed the services of several eminent gentlemen in their particular departments.—Mr. Herbert Grueber, of the British Museum; Mr. J. N. Hunt, Mr. J. Jones, Mr. Keller, and Prof. Tennant. The intaglio engraving on precious stones is well worth inspection; but we have no space to particularise further. One special exhibit enhances the attraction of the Turners' collection, namely, the casket recently presented by the City of London to Sir Henry Bessemer.

The judges, in making their awards, say "that the majority of the exhibits display much excellence of workmanship; in many cases, novelty of design; and in several considerable appreciation of form and design." It is to be regretted the last-named qualities are not more marked in wood-turning: good outline and proportion are certainly not absent, but in ivory we cannot say so much. For mechanical excellence the specimens are all that can be desired, and in the management of the lathe the exhibition gives evidence of skill and experience, both of workman and apprentice, due largely to the liberal encouragement afforded by the Company.

Perhaps it may be argued that these competitions encourage rather the mechanical art of turning—manipulative expertness—than the artistic side of the subject. It may be so; but it would be unwise for the Company not to take into their first regard the more utilitarian objects of the turners' art. Hand-turning alone, without the aids of slide-rests or fixed-tool apparatus, is one of the conditions of these competitions, and so long as this rule is observed, the workman or apprentice knows the class of work which is most highly judged of and rewarded. In the reward of the prizes also, the more important of the conditions of success should be kept in view. On the whole, among workmen of one class there is an aptness to over-rate the importance of their appliances, and it is evident that the lathe may be carried too far in the production of objects. Any attempt to exaggerate this—to show how much the lathe can do rather than how it can be legitimately used, might be well left to the good taste and discretion of the judges, and we merely hint the point as well worthy of consideration by future adjudicators.

ROOFS AND RAINFALL.

THE capacity of new roofs to withstand a rainy season may be quickly tested by a steady rain of a few days' duration. When oak-timber was plentiful and slating was done under the "measure and value" system, there was seldom need of repair to the roof till the building was literally worn out and the gutters refused any longer to carry off the surplus water. In those days gutters and flats were seldom laid with lead less than 8lb. to the foot superficial; flashings were covered with lead of 6lb.; but the era of speculative building, and leasehold tenures have brought with them an entirely new system. In these days, houses built to live in, and those intended to let, are of different qualities, and there is no more certain method of judging of a well-built house than the examination of its roof. To a non-professional person this may be difficult, but he has always one never-failing means at command, namely, the condition of the upper ceilings. These may show signs of damp spots near the front or side walls, if they do not more plainly and undisguisedly reveal other glaring imperfections in the roof. In the construction of small houses, the utmost carelessness is manifested: the rafters are generally made to span from front to back, and are of the meagrest description; there are no purlins or struts; the slates are brittle and porous in quality, they do not give out a metallic sound when struck, nor bear being easily "holed." In examining the roofs we find them improperly bonded, some slates placed lengthwise, no sufficient lap, no double courses at the eaves, no filleting of cement, and the slates secured by inferior nails of mixed metal.

The operation of covering-in houses in London is one very rapidly performed, and the slater is left pretty much to his own devices. If there be an architect employed he is not always free from blame. A house may be roofed badly, the timbers may be disposed awkwardly and uneconomically; instead of the rafters springing from the walls they may be placed without any reference to them; the ridges and gutters may be disposed so as to form a great receptacle for rain-water and snow on the roof, and flats may be employed unnecessarily. The weakest points in roofs are those where the slating joins a stack of chimneys, where gutters are formed, as behind a parapet, and wherever an interruption takes place to the flow of water. A gutter in the middle of a ceiling, a case of constant occurrence in the metropolis where the party-walls form the ridges, is a direct source of mischief. An incessant downpour is sure to find out the weak points of the middle gutter, the defective "filleting" or "flashing"; the lead may be worn in holes, the cement fillet may have cracked or have never been properly formed, and the flashing may be an apology for one, yet they all may have answered under the ordinary shower of rain. The perfectibility of our roofs must, in a great measure, depend on the slater and plumber, and their skill and integrity are the only guarantees the builder or tenant has. When, by the covenants of the lease, the tenant undertakes to keep the roof watertight, a bad roof becomes a serious infliction upon him; even where the landlord agrees to keep in repair the outside of a house, and the roof is constantly needing mending, the tax is one which bears heavily upon the comfort of the one and the pocket of the other.

But the roof has another function besides that of throwing off the rain in a perfect manner: it might be made the gathering-ground for the household supply of water. For country districts, the value of storage has been urged by our leading sanitarians, and in towns its collection, in properly-constructed reservoirs, would diminish the amount of surface-water which deluges the areas and back yards of our houses, or floods our sewers. If we take London, very few houses are provided with tanks or rain-water butts, and an immense rainfall must necessarily be drained off by the sewers, either directly entering them, or indirectly, by first running over our areas and roads. The inconvenience resulting from a large accession of rainfall is, therefore twofold; it deluges our areas and roadways, as well as choking our sewers. A few days' continuous rain at once forces upon us the serious nature of the matter. Basements are flooded with a dilution of rain and sewage matter, for there is no separate conduits for surface-water, as there should have been, and our roads are rendered impassable in nearly all the low districts. If this immense rainfall could be caught and stored, or even partially, the sewers would not be so overburdened, and the water might be used for many, if not all, of the purposes of the household. If, as we are given to understand, the average rainfall over the British Isles is from 25in. to 30in. annually, we can by an easy calculation find out how much might be collected for a house of a certain size. Of course allowance has to be made for certain losses in collecting. A tiled roof wastes about 20 per cent.; a slated roof about 10 per cent. This loss is partly by absorption, and by the capillary attraction between the slates, and partly by the splashing over the edges of roofs and gutters. If we take a house of moderate size in a town, say 20ft. by 50ft. deep, we have 1,000 square feet, and at 30in. rainfall, deducting for loss, a mean daily yield of water of about 36 gallons may be estimated. In dry years this would be reduced, but still there might be calculated a supply of over 20 gallons, sufficient for all ordinary purposes, or as a supplementary supply to other sources.

The question of storage need not be one to present any difficulty; an underground tank is the best, as not liable to great changes of temperature, hot suns, and other impurities to which the butt or cistern overground is exposed. Where an underground tank cannot be constructed, one might be obtained under the roof of the low buildings or offices of sufficient capacity, in which case galvanised iron would be a good material; but where there is ground enough for a reservoir below the surface, a concrete or brick tank lined with ½in. of Portland cement to prevent all possibility of infiltration, and provided with an intercepting chamber for the pipe from the roof, with manhole, is the best receptacle for storage. For a house of the size we have imagined, a cistern of a cubical capacity of 750ft. would suffice, and, for rough calculation, a shilling a cubic foot may be taken as the cost. It has been recommended that instead of one large reservoir, two or more smaller ones would be desirable, and one of such tanks might be placed in the roof of house, or sufficiently high to supply the upper floors. We have said nothing about the pitch of roof, though the steeper it is the quicker the rain runs off, and there is less disturbance by the action of the capillarity between the slates; the aspect of the house is the main element in calculating for a supply. Facing a wet wind a roof will catch a good deal; according to one authority (Mr. Wallis, F.M.S.) a flat roof will catch most water in a sheltered position, and a steep one in an exposed position. The main conclusion, however, we wish to draw is that, with a well-organised system of roof-collection, the rainfall instead of becoming a source of flood and devastation, carrying with it wretchedness and disease to our large town populations, might be usefully housed to supplement the present water supply.

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THE SOCIAL SCIENCE CONGRESS.

The 24th annual congress of the National Association for the promotion of Social Science was held last week at Edinburgh. Among the proceedings likely to interest our readers, was an interesting discussion by the Health Department on Thursday week, under the presidency of Dr. John Beddoe, F.R.S., on the subject of

SANITARY ADMINISTRATION.

The President having stated that the special question for discussion was:—"What are the best areas for sanitary purposes, and how far should there be a revision of the mode of electing and continuing the services of the officers under the Public Health Acts?"

Sheriff Spens introduced the discussion of the question by reading a paper on the defects of the sanitary system of Scotland, with respect more particularly to the urban and rural health districts. About four years ago, he said, he made an inquiry into the working of the public health bodies, and the executive machinery they had to work. An inquiry into Public Health administration divided itself into two heads—the subject matter of the law, and the administrative and executive machinery by which its provisions fell to be carried out. The last was probably the most difficult to deal with. But he thought it was clear that there must be a central health authority intrusted with the superintendence of the local health authorities; secondly, there must be urban district authorities; and thirdly, there must be rural district authorities. Then, again, it was necessary that there should be officials under these administrative bodies to see that the provisions of the law were being systematically enforced upon the people. The conclusions at which he had arrived, as the result of his inquiries, were:—(1) That there should be a reconstitution of our present health authorities. (2) That, whilst having reference to the provisions of local health government, it seemed necessary that the administration of public health should be retained to the town councillors or police commissioners in large towns, there should be certain districts forced to take upon themselves the burdens of administration whenever population arrived at certain amounts within certain areas; and, further, that very considerable power should be given to the central authorities to insist upon the public health provisions being carried out in an efficient way. (3) That the present rural local authorities were perfectly unfit for the work committed to them, and should be replaced by others. (4) That the central authority shall have central sanitary inspection to a much greater extent than now was the case. (5) That there should be sanitary inspectors and a medical officer of health in every parish. Referring to urban health districts, he thought that in the larger towns the law, as it was, was administered as well as it could well be, generally speaking; but, in the smaller burghs, it was greatly a sham. With regard to these, besides having skilled local inspection, he hoped to see a central sanitary inspection, and he would provide that, in cases of neglect of duty by the district authorities, the court of session, on the application of the central authority, should have power to appoint one or more commissioners, for whose salary the town should be taxed. There should be, in particular, a law regulating the sanitary condition of burghs springing up around large populous places, such as Glasgow. He did not think any house, in town or country, should be allowed to be put up without some proper system of sanitary inspection. With regard to rural health authorities, his inquiries had convinced him of the utter apathy and inefficiency of these authorities in Scotland. Generally, unless compelled by an outbreak of disease, or the action of the Board of Supervision, the duties of these authorities were apathetically and perfunctorily discharged. It had, he contended, been proved by experience that the rural authorities of Scotland had proved themselves unfitted for the discharge of public health duties; and he submitted that new rural health authorities should be constituted. He would prefer to see a change altogether in the constitution of the parochial boards, and to see them transformed into popularly elected bodies. But, apart from that, he thought that a central authority or commissioners, appointed under the Public Health Act for the purpose, should make inquiry, having special reference to drainage and water supply, into the rural districts of Scotland, so as to group them into public health areas; and that the local authorities of these districts should be elected by the parochial boards of the parishes grouped together in the district—preferably, as he had already said, by differently constituted parochial boards than those now existing.

Subsequent papers were read on "Medical Officers of Healths' Duties and Responsibilities," but the discussion generally was not of a very practical character, with the exception of the remarks made by Mr. S. W. Hastings, and Dr. Russell.

Mr. S. W. Hastings, M.P., President of the Council, pointed out that the recommendation of the Royal Commissioners in favour of the adoption of the union as the rural sanitary area, on which the last Public Health Act was framed, had been carried only by a majority of one. The minority had been in favour of the county as the sanitary area. Now, the result of adopting the union had been to make it impossible for rural sanitary authorities to pay their medical officers salaries which could under any circumstances induce them to give up private practice, and devote themselves to sanitary work. In his opinion it was a fatal error to cause a medical officer of health to engage in private practice; first, because sanitary functions at the present day were such as demanded not only all the time, but also all the thought and energy, of the medical officer who undertook them; and second, because very often his duties as a public officer conflicted with his own private interests in the pursuit of his own private practice. Accordingly, this adoption of the union as the sanitary area was one of the first things which the Legislature should undo. (Applause.) Even if no other thing was done, this alone would be productive of great good. In his own county of Worcester they had ten rural unions, and between them and the small boroughs, from £800 to £1,000 could easily be paid to one skilled and efficient medical officer, who could do the whole sanitary work of the county. In answer to Sheriff Spens, Mr. Hastings said he would give the sanitary administration of a county to anybody that Parliament thought fit to trust with the general administration of the county. But at the same time, he thought that if Parliament wanted to do what was right, it would provide at the earliest date an elected body for the administration of county affairs.

Dr. Russell, Glasgow medical officer of health, said it was much easier to get amendments to our present Acts from Parliament than to get these Acts properly put in force. One necessity to this end was to secure the independence of the medical officer. He condemned Dean of Guilds Courts as being quite incapable of dealing with the sanitary requirements of houses.

Sheriff Spens, in reply, said that practically in England—the President of the Local Government Board having a seat in the Cabinet—there was a Minister of Health. His idea in the event of such a central authority being permanent, was that there should be in Scotland a Sanitary Inspector-general, if he might so term him, to whom the local sanitary inspectors and medical officers should report.

The President, in summing up the result of the discussion, said that in England about £64,000 a year was paid to medical officers of health, besides various amounts paid by various districts who did not accept Government aid. That sum, if judiciously divided, should provide the services of a sufficient number of competent medical men, who should give their entire time to the work. It was worthy of notice that in the last few years the mortality in the seven largest towns was considerably less than that in the towns next below them.

Professor Fraser moved, and Councillor Gowans seconded the motion—"That the meeting strongly recommends that the Council should consider the question of the sanitary rural areas of Scotland, with a view to an amendment of the law by their extension."

Mr. Hastings suggested that the words Great Britain should be substituted for Scotland; but upon Sheriff Spens and Dr. Acland, Oxford, pointing out that the English question was a complicated one, and could not be competently judged of on the consideration it had there received, the motion, as originally worded, was unanimously adopted.

SANITARY REGULATION OF BUILDINGS.

On Friday, in the Health Department, the special question for discussion was:—"What is the best mode of amending the present laws with reference to existing buildings, and also of improving their sanitary condition so as to render them more healthy, having due regard to economical considerations?"

Councillor Gowans, Edinburgh, opened the discussion. There were, he submitted, radical flaws in our present system of regulating the erection of buildings. The Public Health Act of 1867 was a step in the right direction, but it was intended chiefly to apply to small towns, and was largely permissive. Therefore, one community might observe proper precautions, while another was permitted totally to neglect them. Hitherto advances in sanitary science in large cities had almost invariably been the result, not of precaution, but of the scare from time to time produced by some frightful visitation of contagious disease. Progress, therefore, had necessarily been spasmodic and unsatisfactory. At the present day the conditions of sanitary well-being were becoming better understood; and he submitted that the following reforms should be given effect to:—(1) There should be drawn up a code of public law on the subject of health applicable to the United Kingdom, and compulsory throughout. (2) There should be appointed a Minister of State for Public Health, with a seat in the Cabinet, to whom local authorities should be directly responsible for due administration of the law. And (3) that no person other than an architect, educated, examined, and qualified as a lawyer or a doctor now was, and under a corresponding responsibility, should be permitted to submit plans to a Court. Whilst economical considerations must not be overlooked, they must not be, as at present they were, nearly the main consideration; and Parliament ought to step in and enact that no mere money considerations should interfere to prevent proper sanitary appliances for the preservation of the public health.

Professor Fleeming Jenkin, Edinburgh, read a paper giving an account of the Sanitary Protection Association, founded at the suggestion of the writer in the spring of 1878, to effect the objects indicated as desirable in the question before the Congress. In consideration of an annual payment—usually of a guinea—the member obtained: 1st, a report on the condition of his house; 2d, inspection of alterations made; 3d, an annual experimental test of the conditions of the drainage system. The society was a mutual benefit society, closely analogous to steam-boiler associations. The association numbered about 500 members, and had worked smoothly and effectively. Much stress was laid on the fact that annual superintendence, after houses had been put in excellent order, was the main business of the Association; also, that this superintendence involved experimental testing of the pipes and drains, not mere ocular inspection. The Association could only deal with the houses of well-to-do people, and was most popular with owners who occupied their own houses. To meet the requirements of the whole town, compulsory inspection based on similar principles was required. This inspection could be afforded by a moderate increase in the staff of the medical officers of health; but the requirements to be insisted upon would, under compulsory inspection, be necessarily meagre, owing to the great expense which very thorough reform would entail on the lower class of households or house proprietors. The Professor urged that the Association, by its successful action, supported the arguments of those who wished to introduce compulsory inspection of the same kind, and concluded by urging that new members should join the Association, mentioning that outlying towns might be affiliated if they could provide fifty members, and also urging the desirability of founding similar associations elsewhere, now that the completely practical nature of its action had been proved by experience.

Sir Robert Christison supplemented Professor Fleeming Jenkin's paper by stating, as President of the Association, that the inception and successful results of the Association were owing to the Professor. He had large experience of the great good which the Association had already done. His only surprise was that, instead of their now having 500 subscribers in Edinburgh, they should not have 5,000.

A discussion ensued, the result of which showed that the object of the Association of Professor Fleeming Jenkin had met with uniform approval, whilst the idea of extending it to the poorer classes by Government action had not met with such general approbation. The suggestions made in the discussion did not admit of any general resolution being passed.

THE EDUCATION OF ARTISTS.

In the Art Department the same day, Mr. Hubert Herkomer, A.R.A, opened the discussion on the special question, "How far would the revival of the old system of 'master and pupils' be of advantage, and tend to promote the growth of historical art in the country and the fitting use of painting and sculpture in our public buildings?" He had, he said, modified the title of his paper as follows:—"How far would the revival of the old system of 'master and pupils' be of advantage in the present day, and tend to promote the growth of true art?" Inquiring first, how far the old system was advantageous, the writer remarked that the imitative faculties of the mind awaken early, and are the first to be exercised; reason and invention follow. It is thus that all art-workers have built their earliest efforts upon what has gone before them. When they have reached the point where originality begins to assert itself, they diverge into other channels—ripening, advancing, or varying the existing art according to their powers of originality. History is replete with facts showing that all great souls had to shake off, and frequently with an effort, the influences of their masters, before they could do one single touch of that work that has made them immortal. This reflects seriously upon the system of tuition under consideration. Unless the student is led at the very beginning of his education to expect the final appearance of independent "mind-seeing" and interpretation of nature, he will aim little higher than imitating, not nature, but another man's interpretation of her. This individuality is the great mystery and secret of the art-mind. It cannot be transmitted to others, and cannot be stolen, for the best resemblance to another man's originality of style is but an imitation. The highest mental qualities, being originality and loftiness of invention, would appear last. Considering, then, that the qualities which are active at very early stages are the imitative, and bearing in mind that the system of masters and pupils exercises and encourages those qualities almost exclusively at first, it is not strange that those soul-given qualities, which are fixed for later development, should be lamentably impeded in their attempts to come to life. The system retards the growth of those qualities that make the painter renowned; that is one great flaw. Another danger attached to the system is that of the pupil being put under the wrong master; that is, under one antagonistic in all his ideas and aims to the innate but closely-hidden tastes of the student. Imagine the late Frederick Walker put under Maclise. Surely Walker, whose characteristic was to draw out the tenderest passages of nature, would have had the natural bent of his mind irritated and chafed. As it was, he was placed, with but little artificial tuition, under an engraver, and told to draw as much in the style of John Gilbert as possible. Then he had to draw on wood the sketches of Thackeray for his "Philip"—awful drawings—and Walker sorely wanted to try some original illustrations, instead of working out Thackeray's caricatures. He timidly suggested it, tried it, and at once showed, not traces of having imitated John Gilbert, but the originality that was in his mind. Now, this highly nervous, sensitive man, who never showed his work whilst in progress, even to the models who sat for him, and who would have been the last man in the world to have pupils around him, actually but unconsciously formed a school. From his life and works we can gather—First, that this painter would have done nothing greater (perhaps nothing so great) if he had been placed under a master; and second, that he would not have exercised a greater influence than he did by his works alone, if his studio had been full of pupils during his lifetime. After further illustrating the effect of a wrong selection of masters, the writer went on to remark that the works of great men have always had a greater influence upon young painters than personal tuition has had. The cleverness of drawing and so-called learnedness of French painters is as much due to the national character of the artists as to their school influences. In England we have certainly no strong school influences, but we have what is nowhere in the world so strongly developed, and that is originality and individuality of style. The French are as unhappy in their selection of subjects as they are certain of their drawing. It is their aim to strike, to startle, to fascinate. English art, however faulty it may be in precision of drawing, seems to take you by the hand and lead you to nature, and bid you love it—to humanity, and bid you learn its lessons. This is a national characteristic produced spontaneously without any central impetus, such as might accrue from the teachings of one man. What more do we want? Do we want more learning? Those who look for "learning" seem to be under an impression that it cannot be found in realism, that to show any learning you must paint the classic only. This is entirely erroneous, and is the cause of the word "learning" being misunderstood. Millais's head of Gladstone was full of profound learning, and so was his hastily-painted portrait of Mrs. Jopling. Learning comes with practice; originality never by practice, but it must be awakened by exercise. There is a danger in too early attempts at picture-painting; but this is only dangerous to the weak, and that only in case their first efforts are successful, so as to cause them to get into one groove, and work only for money. On the other hand it is a significant fact that of those students who draw and paint such admirable studies from the life, and win gold medals, very few ever become eminent painters. Their mistake lies in simply doing what is placed before them, and in not being obliged to exercise originality, so as to make every study a picture. A master either forces the student into imitation or of similarity to his art; for in most cases the master allows the student to work upon his paintings, and the styles must meet. It is as difficult, however, to define the difference between similarity and imitation as it is to find the exact point where borrowing ends and stealing begins. If the pupil is to be a reflection of the master, the master must be unapproachable in his greatness, and there must be but one kind of art, and that his. We have yet to see the work of art that will positively satisfy all intelligent minds, and we have yet to find the master capable of training students of every variety of mind. Some sort of tuition or instruction is, of course, necessary; but its effect is only felt in the art of the time, when the highest grade of studentship is paid much attention to. Good schools, with the best masters, might raise a higher level of art; but it is doubtful whether a higher level would produce more great men.

Mr. Edward J. Watherston, London, in a paper entitled "The Essence of Art: Is it Genius or Ingenuity?" condemned the modern system of encouraging artists by means of art unions and prizes.

A discussion ensued; among others—

Mr. George Burnett, advocate, discussed the education of architects in this country and in France, and said he thought the result of the Continental system was that they had there a living school of architecture, which he did not think we had in this country. He knew of no building in this city, with perhaps one exception, which appeared to be designed as a natural result of the feeling of beauty in the artist, working upon the plan which was required by his employer, and upon his materials.

Mr. Herkomer having made a brief reply, in which he referred chiefly to the question of historical art,

The President (Professor Richmond, of Oxford) wound up the discussion. Touching in the outset of his remarks upon the question as to what should be the education of the student before his powers of selection had been formed, he pointed out, in the first place, that the technique of art was enormously difficult. The hand had to be trained to express what the eye saw or the mind conceived. Mr. Herkomer appeared to think that it was rather detrimental than otherwise for a young painter to be placed under a master with whom he did not entirely sympathise. With that he ventured to disagree. A student might have a great turn for form, and in that case the best master for him would probably be one whose strong point lay in colour, so that the student would have prominently brought before him that in which he was most deficient. He did not agree with the idea that learning was not necessary to art. By learning he meant knowledge of construction, and particularly of the construction of the human form. That knowledge could only be got by being taught intimately and in the studio of a man who was conversant with it. Then there were such things as laws relating to drapery, which, if known and understood, were of immense assistance to any painter. He could not see why both anatomy and those laws governing drapery—simple enough things to learn—should not be taught by a master to his pupil, and why that sort of teaching should not be of infinite value. He had often had occasion to lecture upon the question of art schools, and he had always made it a point that it was quite absurd to teach men about the human figure by putting up a model, and making them do stupid drawings from this, very likely, extremely ugly individual. What he would do was this: He would take, in the first instance, some beautiful example in antique sculpture. Side by side with that he would place a model, and he would then make the students draw the two, one after the other, and it appeared to him that the taste would be guided, and the spirit of analysis and selection between beautiful and ugly forms, which they all knew to be so necessary, would be called out and developed. Such a course would prevent, in after life, the errors of taste which, though committed almost unconsciously, were so disgusting to others. Then, with regard to action, he would have a motive given for every figure that was drawn, and he would not allow any student to work for more than ten minutes at an action at a time. In regard to wall-paintings, the art of the world, he remarked, had been done on walls, and he thought that was the sort of education that was necessary in England to enable men to paint on a large scale. Unless they got some system of art which would enable them to paint large subjects upon walls, he thought their art would degenerate into mere *genre* painting. As to the master and pupil question, it was clear that they could not create originality; but they could further it by educating students in such a workmanlike manner that, when it came to them to express themselves, they should be able to do so in clear language. They should know the grammar of their art, and, if they possessed any originality, it would come out. Rather, he should say that a man was not original, as a rule, till he was educated. If they took the growth of a man like Shelley, they saw that his early poetry was inartistic. It was emotional to a degree that was unpleasant. There were too many imageries in it. It was overcrowded; it was unselected. But, as the poet became more and more conversant with the great, noble, unrestrained Greek poetry, he eliminated an enormous deal of that matter which was really of no account whatever; and as he grew older, as he became more educated, his poetry became more beautiful and artistic, while it lost none of its spontaneity or originality. This was what education did, and he did not see why, if education did that in poetry, it should not do so in art. They had been talking about historical art. That was a very difficult subject to deal with. He was very much inclined to agree with Mr. Herkomer that true historical painting was contemporary painting, but he would be inclined to go further and say that true historical painting was portrait painting. He thought their ideas of what Charles I. was like or what they fancied he looked like under certain circumstances, was of little value. It might be an admirable work of art, yet it could not be historical. A portrait of Charles I. by even an inferior artist, would be of more real value as a historical painting. The truth was that in so-called historical works artists had desired to paint the dresses rather than the people. After alluding to the influence of allegorical painting, Mr. Richmond, reverting to the subject of education, said that what they wanted, after all, was to further the cause of art. They did not care how the education was got, they wanted the education. On the whole, he believed they were inclined to think that the teaching gained under the direction of a master was better than that gained under the direction of an academy. After all, the larger education came after a man was in a sense done learning his grammar; but, he would say to him, let him be taught his grammar first.

SURVEILLANCE OF STREET ARCHITECTURE.

Mr. Robert Morham, City Superintendent, Edinburgh, read a paper on this subject, in which he sought to show how far it was desirable, and how far practicable, that there should be vested in the Local Authority or in some public body, power of control over the manner of dealing with the designs of buildings likely to form prominent features or otherwise affect the amenities of towns.

DR. BEDDOE ON HEALTH.

On Saturday Dr. Beddoe, the President of the Health Department, delivered his address. Dr. Beddoe said the duty of the section was to ascertain the condition of the public health, and those measures, whether in the nature of Governmental action or private efforts, which are likely to maintain and promote it. He referred to the improved conditions of life now as compared with what it had once been. He argued that, in order to preserve the public health, attention should be paid to the style of building dwelling-houses, to their thorough ventilation, and to the adoption of the most approved sanitary methods. He asserted that statistics amply proved that mortality increased in the towns with the density of the population, and physical degeneration in inaptitude for military service, so far as Great Britain was concerned, was an affair of the towns. He advocated careful juvenile training in the principles of health, and special care should be taken to secure efficient instruction in athletics. We reproduce in full his remarks on the

HOUSE ACCOMMODATION FOR THE WORKING CLASSES.

To the nature of the houses in which the people live we can hardly attribute too much importance. In the early part of this century there were very great provincial differences in this respect, but by far the larger part of the population is now housed in dwellings of comparatively recent erection, and approaching in some degree towards a uniform type. Contrast, for example, the average Highland hovel, built and managed on the principle that "the clartier the cosier," but which, if small and dirty, is usually warm, and in which much-needed ventilation is provided—unintentionally, indeed—by the numerous chinks in the walls; contrast this with the Cumberland house—large, roomy, and clean, but apt to be cold, and only prevented from being colder still by the almost hermetical sealing of the windows. The worst kinds of tenements in large towns, and notably in the wynds of Edinburgh and Glasgow, combine the worst features of both these, the dirt, the crowding and the want of ventilation; while there are favoured districts known to me in the South of England, where the cottages, generally half-timbered or built of *pisé*, were at once warm, dry, roomy, and tolerably clean. The subject of modern houses for the working classes—how they are built, and how they ought to be—has frequently been debated in this Section, and would furnish material for a dozen addresses such as mine. I will make but two or three remarks on it in passing. Landlords, whether from philanthropy and a sense of duty or influenced by public opinion, have done much to improve the dwellings on their estates, and speculative builders have, to some extent, been coerced by Building Acts and bye-laws; but I do not think the improvement is so great as is usually supposed. If it were, one would expect to see a decided improvement in the death-rate from phthisis, from pulmonary diseases, and from rheumatism; for warmth, dryness, and proper ventilation ought to act favourably upon all these; whereas, in fact, if phthisis has decreased, other pulmonary diseases have quite made up the difference; and there is no improvement in rheumatism. I should say that, as a rule, the requirements of decency are more studied than they used to be, and that, perhaps, dryness of site and foundation is more looked to; moreover, by the persistent action of medical men and sanitarians, including many names well known in this Section, much has been done for water supply and sewerage, and disposal of refuse, so that the great scourge of enteric fever is being gradually abated; but thin walls, bad mortar and flimsy roofing cannot make warm and dry houses. One curious and unexpected result of building improved cottages has been brought to my notice. I am informed that in a certain Highland district where the proprietors have exerted themselves to build decent and air-tight dwellings for their small tenants, crofters, and labourers, instead of any improvement in health following, consumption, formerly uncommon, became very rife and deadly. Similarly, the natives of New Zealand, though their ordinary mode of lodging is about as ill-contrived and unwholesome as can be conceived, are said to suffer in health, and specifically to become more phthisical when they take to living in houses of the European pattern. In the case of the Highlanders it is probably want of ventilation which is the fault of the new and comfortable houses. On the whole, it would probably be well to adapt to cottage-building the primary rule of British politics, correcting the evils of the local type of dwelling, whatever it may be, rather than seeking to introduce an entirely new one. The present Earl of Derby, in an address delivered to this Association several years ago, recommended that the difficulty put in the way of constructing workmen's dwellings in towns by the exorbitant price of sites should be met by increasing the vertical elevation of the buildings. And we see that elevation of buildings is constantly being increased, though not so much in the case of workmen's dwellings as of upper-class houses, hotels, and warehouses. The change is not one to be commended. A street 50ft. wide, with houses 80ft. high, is scarcely more pervious to sun and wind than a lane of 20ft. with houses of 32ft. The population on the same area will probably be about the same, and Dr. Farr has shown us that, *cæteris paribus*, the rate of mortality increases as the density of population. Lofty staircases tell unfavourably on the health of those who frequently ascend them; hence the anæmia and functional affections of the heart which are the plague of London housemaids. And there are other evils connected with over-lofty houses well known to the citizens of "Auld Reekie"

BUILDERS AND PLUMBERS GUILTY OF MANSLAUGHTER.

Going on to consider the best means of ameliorating public health, Dr. Beddoe said: Three ways of doing this are before us for special consideration during the present meeting, viz., the best modes of organising and officering our sanitary forces, the best ways of applying their work to existing buildings, and the best ways of preserving or restoring the purity of our streams and water supplies. I shall not presume to enter on these questions in the few minutes that remain to me; but I would like, before we separate, to say a few words on what may be done towards the improvement of dwellings and of schools. As for dwellings, though the multiplying of enactments is bad, and the multiplying of officials is worse, increasing expense and making openings for jobbery, I am disposed to favour a moderate extension of legislation, especially in the direction of prohibition of what is certainly known to be mischievous or unsafe. Thus it seems monstrous that men should be allowed to build new houses within ordinary flood mark, as has been done in hundreds of cases within my own knowledge of late years. There are other offences against the laws of nature which are so clearly proved to be such that they are almost criminal, such as carrying a soil-pipe under a house, or placing a watercloset in the middle of it, neglecting to trap a main drain, and so forth. Surely the perpetrators of these things ought to be held responsible in purse or in person. When an over-worked or muddle-headed signalman or pointsman commits a blunder which has fatal consequences, he is amenable to criminal law; much more should the artisan be so who, by scamping his work, brings death into an unsuspecting household. I cannot agree with those who say that the public, the house-tenants, are generally indifferent to these things, because they avoid putting themselves to an expense they can often but ill afford in investigating their house-drains for the sake of a doubtful benefit. I should say that among the upper and middle classes, at least, there is a great though vague horror of "bad drains," but they have not usually the skill nor the power to protect themselves, the masons' and plumbers' work, good or bad, being covered up and concealed. Few principles in building seem to be more valuable than this—that the whole work connected with the drainage of a house, sinks, soil-pipes, ejects, and so forth, should be so placed as to be readily inspected and investigated. Meanwhile, as the public are incompetent to protect themselves, it seems to me that the liberty of builders and plumbers to do mischief should be closely restricted. Nevertheless, after all this has been done, it will continue to be necessary to educate the community (I will quote here a Cincinnati sanitarian, Dr. Minor) "as to the necessity that exists for guarding against those special causes of disease due to the collection of large numbers of people on limited areas. The possibilities of public hygiene," he continues, "depend on such education, and to promote it should be one of the main objects of health authorities, whether municipal, State, or national; for without it they have no firm foundation in a country having either a republican or a democratic form of Government." Of the need for such education in Cincinnati we may judge from the fact that a large part of the city drains into the Ohio river above the public waterworks. In this country, at present, local government works pretty fairly, the lack of education being supplied by the control of a central body, which can avail itself of the knowledge of the best experts; but, in view of the progress of democracy, Dr. Minor's advice as to the education of the masses becomes more important. But education is needed in many matters pertaining to health which concern individuals rather than the public. The need of ventilation in houses is one of these. Dr. Gregory was accustomed—so Sir Robert Christison tells me—to carry, when on his rounds, a good stout cane or stick; and when he had to visit a case of fever among the poor of Edinburgh this stick was very apt to be carried in a horizontal position. So the end of the stick was very apt to poke itself through the window; and the window was very apt to remain unmended until the termination of the case, when the worthy doctor would send a glazier.

SEWAGE AND WATER SUPPLY.

On Monday, in the Health Department,

Dr. Stevenson Macadam introduced the special question of the day, which was:—"What are the means which should be adopted for the prevention of the pollution of streams, without undue interference with industrial operations, and for the preservation of pure sources of water supply?" This subject, he said, was of national importance.

Sir James Alexander read a paper on the same subject, in which he explained that the Anti-Pollution of Rivers Association, of which he was president, hoped to take the owners of public works along with them, and to convince them that their interests would not suffer if they did their best to prevent the pollution of our once fish-producing rivers. They should make every allowance for gentlemen who had succeeded to public works, who should be allowed ample time to apply means for the removal of the pollution. But no new works should be opened without every means being adapted to prevent them polluting the water of our streams. Some of the small towns, as Dollar and Alva, were showing a good example in adopting means for doing away with town pollution. Major-General Scott, C.B., F.R.S., in a third paper on this subject, said he could not forbear to again urge, as he did six years ago at the Glasgow Congress, that nothing would be done unless some definite and moderate standard of purity were prescribed. He would make it imperative upon towns to provide tanks in which all sewage should be clarified by simple subsidence, before it was cast into the river. If the analyses of the most eminent living chemists were to be relied upon, the matters obtained from water-carried sewage by simple subsidence, and unmixed with bulky precipitants, could readily be converted into a portable manure of great value to the farmer. The various reports of the Rivers Pollution Commissioners, showed that in the pollutions arising from woollen and dye-works, paper-mills, mines, collieries, china-clay works, and coal-washing, the mere fact of impounding the liquid refuse products in tanks for a space of a few hours was sufficient to effect a marked degree of improvement in the effluent. Indeed, in some cases, after this simple treatment, the clarified water was found to be even more pure than the river water previous to its use for such industrial purposes. Nearly every one was now thoroughly convinced that sewage sludge was a perfectly worthless and unmanageable commodity, which would not even pay the cost of carting to the farmer. Such, he stated, was, however, quite a mistake. It could be thoroughly deodorised and prepared for the farmer by treating it with lime and superphosphate. He wished also to point out, in connection with this question, that in towns such as Edinburgh and Glasgow, where fœcal matters were collected in tubs or pails, a manure of a much richer character could be obtained for mixing with the sludge manure, and thus a compound of far higher value could be prepared. In conclusion, he desired to remind them that the compulsory adoption of the plan of detaining the subsidence matters in tanks need not in any way prevent towns from having recourse to any more perfect methods of purification, nor would it interfere with existing laws for the protection of streams. It would, in fact, serve as an introduction to any improved process. Mr. John Hansen, in a fourth paper, discussed in the first instance the comparative merits of the three methods available for sewage purification—namely, irrigation, downward intermittent filtration, and precipitation. The first two methods, he said, were insufficient and ineffectual, and required too much land for their working. The third required comparatively little land, and examples of the successful working of it, by means of tanks properly arranged were becoming numerous in England. It gave them a permanent method of sewage purification, and one which could be worked efficiently at all times, no matter how inclement the season, which was not the case with the other two systems. The present state of the law was, he thought, inefficient to secure general purification in the public interests, as the law could not be properly carried out on private initiative. He urged that the Local Government Board should have the power to compel, within a given time, all pollution to cease, and where parties neglected to comply with the order, the Board should have the power to do it for them, and charge the offenders with the expense. The third system of purification was, he submitted, peculiarly applicable to the case of such a large town as Glasgow, for the purification of whose sewage only 20 acres of land would be required, with the requisite tanks. His experience was that black ash and lime were the best purifiers of foul water.

A discussion ensued and the following resolution was adopted:—

"That it be a recommendation to the council of the association, that, in order to preserve the purity of rivers and streams, Government should provide for the appointment of duly qualified inspectors for certain portions of the country or river basins, who should have the power of taking certain effective measures for preventing pollution by requiring local authorities to take action, with an appeal from such inspectors in the case of Scotland to the Court of Session, and of England to the Higher Courts there; and that the salaries or charges of the inspectors should be defrayed, like those of inspectors of mines and manufactures and under the Alkali Act, by Government, the purity of rivers being for the general good."

WATER ANALYSIS.

Dr. Drinkwater read a paper on the various methods of stating the results of water analysis for sanitary purposes, in which he advocated the desirability of analysts stating the results of analyses in the same language. In the course of the discussion which took place on the paper, Dr. Aitken said he thought that what was more required was that analysts should adopt the same interpretation of the results of their analyses.

THE SUNDAY SOCIETY.

In the Art Department,

The Rev. R. B. Drummond read a paper on the special question, the object of which, he observed, was to say a few words on behalf of the movement promoted by the Sunday Society for the opening of museums, art galleries, libraries, and gardens on Sundays. A very lively discussion indeed ensued, and at last the president, Professor Richmond, had to make a rather vigorous effort to restore order. Having at last succeeded, he remarked that it showed the extreme weakness of their case when gentlemen wished to put him down, and did not wait to hear what was to be said, *pro* and *con.*, on the question.

ART AND ITS RELATION TO SOCIAL SCIENCE

formed the subject of Professor Richmond's presidential address in the Art section on Monday. The Professor said he proposed to deal with art on that occasion rather from a social point of view than from its very highest standpoint. Referring in the first place to architecture, he pointed out that the very rapid and easy means of communication by railway and telegraph which had been established in recent years had, in a great measure, broken down those local characteristics which were so interesting in the England of an older date. But the old could not last for ever, and new cottages must be built. They ought, however, to be built as well and as lastingly as those which they succeeded. Solid stone or brick walls, well roofed, the strongest and simplest furniture without the overlay of cheap and bad ornament, would never be vulgar, and the same remark applied to woollen and linen unadorned garments. No one would deny the moral influence exercised, even unconsciously, on the whole human race by the nature of their daily surroundings from earliest years. But there was a very large class of the community which, owing to various causes, did not make use of the advantages within its reach of visiting numerous galleries of pictures or attending lectures upon subjects of æsthetic interest. Since, however, the Education Act had been brought into full operation, a chance presented itself to get at the very class which stood most in need of being educated to love what was beautiful and refined, and that class would, he ventured to think, be greatly improved, even morally, by early contact with beautiful objects. Photography being the cheapest and most exact means at hand for the purpose, he would suggest that our Board schools, as well as our parish and Sunday-schools, should, under the guidance of a committee of taste, provide themselves with photographs of fine works of art, which should not be confined merely to reproductions from pictures, but should include architectural details, furniture, patterns and designs, of all sorts. Further, he would have casts from fine carvings, which could be purchased at a very moderate rate, hung with the photographs on the school-room walls, so that every child who could learn to write might learn to draw up to a point which would be of great service in after life. What difficulties to many artisans, he would ask, would not have been overcome if, when young, their hands had been cultivated even up to a limited point of control and sensitive delicacy of touch? Besides healthful amusements, occupation for the eye and hand were the enemies of vice and the strong armour of probity. At present, he believed, board-school children could learn to draw, although in accordance with a routine which was not satisfactory; but the real question was whether the scholars would not be improved and for their lifetime refined by being accustomed in early childhood to have constantly before their eyes art in some of its foremost poetic and practical phases; and whether, being thus trained to see beautiful works, the taste and workmanship of the coming generation would not be likely to be elevated, and the need for better art become a part of its natural existence. It might be very justly asked how such a scheme of teaching could be carried out with success, and the answer to the question was not simple. The Government schools of design were constantly educating men as art-teachers, and where those had been educated others could be educated. We had an inspector of plays, too; why should we not have an inspector of moral tastes for our public streets? What a means might not the system of large advertising pictures by such agency be made for the education of the lower classes! Professor Richmond concluded by expressing a hope that good concerts would become cheaper and cheaper, so that the people might become more and more instructed in music, and by wishing success to Mr. Irving, whose efforts in the direction of dramatic art entitled him, he said, to be regarded as a public benefactor.

THE ART OF THE ASIATIC AND ROMAN PERIODS.

In the same section Dr. Phené's paper was in continuation of papers read at the three preceding congresses. After sketching the art of the Asiatic and Roman periods and examining that of the Ionians, he condemned the exhibition of undraped statuary and paintings in public, where they were seen by the ignorant and by those wanting in art education. Art should concern itself with the life of the present day. In the discussion which followed, Professor Richmond said, with reference to the nude in art, that most of the subjects of the ancient schools were highly moral and extremely beautiful. If the world was of such a prurient nature that it could not stand the sight of the nude in art, he was very sorry for it, but the treatment of the nude in art, he was free to admit, entirely depended on the purity of the individual who treated it. Much damage had been done in modern times by French art.

SCULPTURE.

Mr. H. P. McCarthy read a paper, in which he contended that, under the capricious influence of fashion, sculpture was utterly neglected. He suggested that copies of the best examples of ancient and modern statuary should be placed in our public parks and gardens, and also the appointment of a Minister of Fine Arts, empowered to prevent the incongruities in architecture frequently disfiguring cities.

The concluding meetings of the Congress took place on Wednesday. The only department which assembled for the reading of papers was that of Health, which met in the Parliament House, under the presidency of Dr. Beddoe, and listened to the reading of two papers, one by Mr. T. Ivory on "The Edinburgh Water Supply," and the other by Dr. Norman Kerr on "Music Halls" The usual congratulatory meeting was held in the Council Chamber. The next sitting of the Congress was fixed for Dublin. No invitation was received for 1882, but negotiations are in progress for holding the meeting in Nottingham.

THE ART EXHIBITION.

In connection with the congress, the President and Council of the Royal Scotch Academy organised an exhibition of the works of deceased and living Scottish artists. The exhibition was thrown open on Wednesday week, and will remain open during the congress and for some weeks afterwards. The collection is an excellent representation of Scottish art, during the past two generations especially. It consists for the most part of Scottish landscapes, portraits of distinguished Scotch men and women, scenes from Scottish history and from the pages of Scottish fiction. There are two or three pictures of religious subjects; R. S. Lauder's "Head of Christ" and Sir Noel Paton's "Man of Sorrows"; two or three imaginative creations; David Scott's "Triumph of Love," and Sir Noel Paton's "Fairy Raid"; but Classical subjects are conspicuous by their absence, almost the sole instance in the galleries being David Scott's "Sappho and Anacreon." Besides busts of "Dr. Stella" and "Hamlet," and "Corinna" and "Dante," there are statuettes of "Wallace" and "Bruce," and a statue of "David Livingstone," and Mr. Brodie's statuette of "The Maid of Lorn disguised as a page." In portraiture the present exhibition is rich. It contains a specimen of Scotland's earliest portrait-painter of any reputation, George Jameson, of Aberdeen, who died in 1644. The picture is a portrait of the artist. Of the men of the present century there are many examples. The historical and *genre* pictures are limited in range of subjects. Scott Lauder's "Trial of Effie Deans" is one of the best specimens. All the leading Scottish landscape painters of the century are represented. There are several examples of "Grecian" Williams, including his "Marathon" and "Parthenon." The Rev. John Thomson is represented by three coast scenes. There are two sea pieces by John Wilson, sen. Both Patrick and Alexander Nasmyth are fairly represented. It is in the recent men that the collection is strongest—Horatio Macculloch, William Simson, D. O. Hill, Sir George Harvey, Samuel Bough, and George Chalmers. The exhibition contains some excellent water-colours and several specimens of miniature painting by Thorburn and W. J. Thomson. The sculpture is contributed chiefly by living artists, Mr. John Hutchinson and Mr. W. Brodie being the most extensive exhibitors. Of the other works the most noteworthy are busts of the late D. O. Hill and the late Sir J. Watson Gordon, by Patrick Park, and a bust of the late Sir William Fettes, by Samuel Joseph.

RHIND LECTURES IN ARCHÆOLOGY.

DECORATIVE STONEWORK.

THE second of the Rhind lectures in Archæology, was delivered at Edinburgh on the 7th inst.

Mr. Joseph Anderson, the lecturer, said he meant that day to deal with "Decorative Stonework." The St. Vigeans group first occupied his attention. In the course, he said, of repeated alterations, and latterly of a very extensive reconstruction of the fabric of the church, it was found that the 12th century builders had utilised a large quantity of fragments of sculptured monuments as building material. After describing in detail the features of the various remains, the lecturer said he would group the points of interest of one of these remarkable monuments. It bore the cross on the obverse side, symbols and figure subjects pictorially treated on the reverse. The cross was long shafted, and the full length of the stone. It was also peculiarly formed. The long shafted cross was often called the Latin cross in contradistinction to the cross with four arms of equal length, which was the common Eastern or Greek cross. But the lines of the Latin cross always make angles at the intersections of the arms. The cross he spoke of was not of the usual form of the Latin cross. It had semicircular hollows at the intersections of the arms with the shaft and summit. This was a peculiarity specially Celtic. The stone also bore an inscription in the Celtic language written in the alphabet used in the Celtic manuscripts. It presented pictorial representations which included the human figure, and a variety of animal forms, some of which were true to nature, while others were wholly imaginary. It presented pictorial representations of objects such as the mirror and the comb, which were true to the reality, and also of objects, such as the double disc or crescent, which were found frequently recurring with a remarkable persistency of form on other monuments, although it was utterly impossible to give them names or tell their significance. Apart from the ornamental work on this monument, there were two distinct phases of art—a pictorial, which followed nature and reality, and a conventional, which followed arbitrary and unknown rules. After considering briefly what mode should be followed in the inductions from these rules, the lecturer said that from these features and these considerations to which they gave rise it was evident that in contemplating the monument as a whole, we stood in the presence of a work of art which did not link itself on with any custom or usage existing in the locality at the present time. The Celtic language still survived in a small proportion of the place-names of the parish, hut not one in a hundred of those to whom these names were familiar had any suspicion of their Celtic origin, and this inscription was now the only surviving witness of the fact that the Celtic alphabet as well as the Celtic speech was once known in the lowlands of Angus. The characteristic ornamentation of the monument was unfamiliar to modern eyes, and perplexing to modern ideas. Its symbolism was even less familiar than cuneiform inscriptions and Egyptian hieroglyphs. The stone remained, but the ideas which its art embodied have passed away with the culture which produced them. It had outlived that culture so long that the language it was intended to speak was now unintelligible. Yet that it once spoke eloquently to all eyes, who could doubt? Men did not make monuments without a meaning, unless when their poverty of invention obliged them to have recourse to obsolete forms, and to appropriate the symbols of a dead faith. In St. Vigeans they had a very remarkable group of monuments, remarkable alike as regarded their number and their character, for thirty such monuments was a very large number as compared with all the others existing. If they pictured this group of thirty such monuments clustered round the pre-Norman church on its isolated mound, if they considered the quality of the art, the interest of the one fragmentary inscription that remained, and the mystery of the symbolical representations that occur among them, they could not but regret that a group of memorials so singularly interesting, impressive, and instructive, should thus have suffered irretrievable destruction. They could judge of what had been lost by what remained of these mutilated products of a national school of sculpture, to which the special culture of the present day did not disdain to turn for instruction and for inspiration. (Applause.) He could only draw their attention to the fact that these memorials were neither poor in design nor feeble in execution—that they were, on the contrary, the productions of able minds and practised hands. Mr. Anderson then went on to speak of the form and characteristics of the Aberlemno group, and their relation to that of St. Vigeans, passing on to describe the Meigle group, and the general features common to the three groups. Special attention was directed to the intense Celticism of their decoration. The transition from the purity of Celtic art to 12th century types was then sketched, followed by a consideration of the special features of the pure Celtic type, the area of the type (which is extremely limited), the ruder type which became associated with it, leading on to the period of incised symbol stones. The relative sequence of the two types, and their association with a third, brought the lecturer to deal with the two varieties—earlier and later—of free-standing crosses. Speaking of one of the specimens at Iona, Mr. Anderson said it presented no figure-subjects, but was decorated in the purest style of Celtic art with such inimitable beauty, intricacy, and harmony of design, that he was safe in saying of it that no finer specimen of art workmanship in stone exists in Scotland. (Applause.) Somewhat similar in style, and not inferior in workmanship, was the beautiful cross at Kildalton in Islay. The special feature of its ornamentation was the intense Celticism of its art. No other specimen exhibited this in such a striking manner. Its two panels filled with divergent spirals and trumpet patterns, and mingled with circles enclosing groups of spirals, and wherever they might be found, and in whatever material they might be executed, would be certainly recognised as products of Celtic art. Nothing like them could be instanced among the art products of any other people or any other time.

THE ART OF THE SCULPTURED MONUMENTS OF THE CELTIC STYLE.

The Rhind lecture delivered on Monday was devolved to the above subject. Beginning with a detailed account of the various figure subjects and symbols having decoration as their special feature, the speaker referred to the prevailing forms of ornament and the relation of their art to that of the Celtic MSS. of the Gospels. On this point he remarked that it was only when the art had been brought to a high degree of excellence that it began to be generally applied to monuments and metal work. There was no reason to suppose that the course of its development was different in Scotland, and hence it must be inferred that where we had such a wealth of decoration in stone there must have been previously a greater wealth of design and a higher style of execution on the pages of books that had perished. The lecturer then described the forms of interlaced work and fretwork, glancing at the Celtic spiral, and the general character of Celtic decoration—a decoration which, in his opinion, implied a culture of the imagination and great refinement of taste. He next traced the process of its development, and related the story of its growth, showing its latest phase as most fully developed in Scotland. Interlacing designs he showed to be not indigenous to the Celtic area, and considerable time was devoted to an indication of the extensive range of these and other elements of Celtic art in space and time. After considering the Celticism of the art of the Scottish monuments, and comparing them with the Welsh, Cornish, and Irish groups, the lecturer dwelt upon the sequence of the types of monuments established by their art characteristics, showing how the Scottish monuments differ from all others everywhere. Speaking of Pagan art and the art of Christian times, Mr. Anderson summed up in the following terms:—They are monuments of Christian character and Christian time. There is no evidence to show that there was amongst our forefathers any pre-existing or Pagan custom of erecting such sculptured monuments in honour of the dead. The art of the pre-Christian sculpture is more usually concealed than displayed. We may find the cover of the cist, a rude unshapely block, sculptured on its under side. But we have never found in Scotland any Pagan monuments erected over a grave which exhibit the least approach to a truly artistic decoration. The custom of erecting such monuments is Christian, and Christian only, so far as Scotland is concerned, and the art they exhibit and the letters they bear were brought into this country with the copies of the Gospels from which Christianity was taught to the people. The art of the monuments was a peculiar development of the art of these manuscripts confined to an unusually restricted area. But within that area it was largely developed. We have no means of judging of the extent of its practice, except by reckoning up the sparsely-distributed examples that are left. It is clear that the number thus computed from casual and accidental discoveries must fall far short of the whole number that originally existed. Yet upwards of 300 separate monuments can still be enumerated. Three hundred examples of an art like this represents a collection of art materials such as has not fallen to the lot of any nation of Northern Europe. These specimens of art-workmanship are not such despicable productions that we need to be ashamed of them. They are works of such merit—art-materials of such intrinsic value and suggestiveness—that our designers, sculptors, and jewellers are willing to borrow inspiration from them. I believe I am correct in saying that no variety of ancient art workmanship is more generally imitated at the present time, and that the closer the copy the better the work. And yet the originals constituting the whole artistic wealth of a country which cannot be said to under-estimate the value of artistic materials lie scattered in neglected graveyards, stand grey and weather-beaten on lonely hill-sides, are existing on sufferance in cultivated fields, are built into dykes by roadsides, converted into gateposts, utilised as tomb-stones, door-steps, or garden seats, and broken up as building materials or macadamising for roads. These wasted, mutilated, maltreated remnants of a school of art, which flourished in Scotland in the dawning time of her national history, if now rescued from the destruction which is gradually and inevitably overtaking them, would still form a magnificent gallery of art materials—materials of the very art which our designers, our jewellers, and our sculptors are endeavouring to imitate, of the only art that is inaccessible to students on account of the costliness and rarity of the works in which it is illustrated.

TRURO CATHEDRAL.

THE new temporary wooden church—a barn-like affair, designed to hold some five hundred worshippers, and built close by the cathedral that is to be—being now complete, the old church of St. Mary has been handed over to Mr. James Bubb, the chief artificer, and his staff for destruction. Practically, this work, in part, has been in hand several weeks, for all the spire, and a greater portion of the tower, are already down. All that Mr. Bubb has directions to preserve of the building is a portion of the south arcade and the south-east wall, whose ornate detail, our readers will remember, is conspicuous in Mr. Pearson's elevation of the new cathedral into which it is to be incorporated. The pulling down of the spire created some little excitement, for although little more than 100 years old, it had been, of course, a feature that every living inhabitant, and his father before him, had known from childhood. Spires are very rare in Cornwall, the beautiful one at St. Bartholomew's Church, Lostwithiel, being almost the only one we know. As for the clock, it is recorded that as soon as it was lowered to mother Earth, several ancient Cornishmen collected, and *shook its hands*, whilst one of them exclaimed, "What a take down, and I, who have known the *face* of 'er all my life, a living here to see it!" The masonry of the tower and spire has been all numbered, and carefully stowed away; it is all of grey granite, and it is interesting to observe how strongly atmospheric influences have worked upon this material, and, in a comparatively very short space of time, eaten away the angles and various surfaces of the ashlar, and destroyed the arrises of the moulds. Granite, as we all know, is composed of quartz, feldspar, and mica, more or less perfectly crystalised and united together. A cursory examination of the Truro spire, now it is upon the ground, shows that whilst the mica stands strong and hard, the feldspar disintegrates rapidly. A straight edge put over any cant of the spire proves that the surface of the granite has been eaten away half an inch or more. We hear a good deal, especially in suburban districts, of the villainous mortar used upon modern buildings. It does not seem that this is altogether a modern invention, for, at least "down West," the same sort of thing was thoroughly understood during the middle of last century. The "mortar"—we use this word in its accepted sense—used in the original building of the Truro tower, was simply earth, nothing more or less, and with, as Mr. Dan Delabole, the cathedral foreman, remarked to us, "not so much as a smell of lime about it"! Nor is poor bond the only bad feature in the construction. The base of this tower, instead of having its foundation upon the solid rock, is carried down but a few feet under the ground, and rests upon a mixture of stone and clay, probably the old bed of the river. This has led to some serious settlements from time to time, and into many of the vertical cracks one may readily thrust a hand.

The church was reseated with oak benches some few years ago. These are to be removed into the new temporary building. The various old monuments, the bells, and everything of archæological and architectural interest will be carefully preserved in a secure place prepared for them upon the site.

Upon the north side of the sanctuary there is a large alabaster monument, dated 1614. It is of Elizabethan character, and has two full-length recumbent figures. It was erected to the memory of Lord Robartes. A number of marble memorials to the Vivian family are close by, amongst them a good bust, by Farrell, of Dublin, to Lieut.-General the Right Hon. Baron Vivian, who died in 1775. At the western end are two life-sized kneeling figures in alabaster, and behind them a stone with five brasses thereon. On the centre one runs this legend:—

> "Here lieth y^e body of Cuthbert Sydenam, woolen draper, who was mayor of this towne, ano. dni. 1627, and departed this life y^e 8th of May, 1630, aged 54 yeares; and had issue by Jane, his wife (at whose cost this stone was laid) 4 sonnes and 4 daughters, viz , Humphry, Cuthbert, Anne, Margaret, and Blanch, deceased, and William, Cuthbert, and Jane then living."

A still more curious inscription occurs upon a Purbeck slab in the corner of the north aisle wall. It runs:—

> "To the pious and well deserved memry of
> N ATS N
> Owe Fitzpen Phippe,
>
> who travelled over many parts of the world. On the 24 Mar., 1620, was taken by the Turkes, and made a captive in Argier. He projected sundry plots for his libertie, and on y^e 17 June 1627 with 10 other christian captives, dutch and french—persuaded by his counsel and courage, He began a cruel fight with 65 turkes in their owne ship w^c lasted 3 howers in w^c. 5 of his company were slaine—yet GOD made him Captaine, so he brought y^e ship into Cartagne being of 400 Tuns and 22 ord: The King sent for him to Madrid to see him, he was proferd a Captains place and the K^s favour if he would turne papist w^c he refused. He sold all for 6,000^l returned into England, died at London 17 March 1636.
>
> "Melcomb in Dorset was his place of birth
> Age 54 and here lies Earth in Earth."
> Geo: Fitz Penass Phippen
> Ipsius frater et hujus Ecclesiæ Rector H.M.P.

The pulpit is octagonal, and of bulb shape, probably of Dutch origin. It is oak and veneered, each cant showing interesting inlay representing respectively our Lord on the cross, the dove, a bird ascending in glory, and a sun with a comet-like tail pointing upwards towards a small star—emblematic, undoubtedly, of the Holy Spirit. Near the south-west door is a fine old Jacobean alms-box in carved oak.

It may be interesting to add that the cathedral has not yet got a chapter formed, so that Mr. John Loughborough Pearson, R.A., the talented architect, receives his instructions for proposed works from the executive committee. As already stated, Mr. Pearson is represented upon the spot by Mr. James Bubb, the managing clerk of works, and under Mr. Bubb's direction the working staff is employed. The new temporary shed—it scarcely deserves a better title—to which we have already referred, was designed by Mr. Henderson, C.E.; the contractor was Mr. Trethowan, and the cost was but £430.

CHIPS.

A Local Government Board inquiry was held at Acton on Tuesday, before Mr. R. Morgan, inspector, with reference to the proposed separation of the Bedford Park estate from the parish of Acton, and its annexation to the parish of Chiswick. The application was opposed by the Acton local board, and supported by Mr. J. T. Carr, the owner of the estate, who had petitioned for the transfer.

On Tuesday, at a meeting of the committee appointed for the purpose of establishing a public fine art-gallery for Leicester, it was announced that subscriptions amounting to over £600 had been received. It was decided to proceed with the gallery and to appeal for public support.

The new church of St. Matthew, South Watford, was consecrated on Tuesday by the Bishop of St. Alban's. It consists of nave 67ft. in length, in four bays, north and south aisles, and an apsidal chancel 37ft. long. At the north-west angle of the building is a tower surmounted by a spire, and rising to a total height of 120ft. Five hundred sittings are provided. Mr. W. H. Syme was the architect, and Messrs. Waterman were the contractors.

The distribution of prizes to the students of the Hounslow School of Art was made on Tuesday week by the chairman of the committee, who stated that the influence of the school was felt from Feltham to Richmond, owing to the energy and perseverance of their art master, Mr. Rutty. He attributed much of the improvement which had been made in our public buildings and in the internal decoration of our dwellings, to the influence of the South Kensington schools.

Francis J. Bancroft, a junior in the surveyor of highways' office, Islington, has been awarded a silver medal by the Alexandra Palace Exhibition Committee for his drawings, commented upon in the BUILDING NEWS, of timber and iron roofs, suspension bridge, ornamental ironwork, and road-construction.

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ILLUSTRATIONS.

CHATEAU DE LA JOVARDAYE.—NORTHAMPTONSHIRE UNION BANK, WELLINGBOROUGH.—NORTHAMPTONSHIRE BANKING COMPANY'S BANK, WELLINGBOROUGH.—THE O'BRIEN ORPHANAGE, MARINO, CLONTARF.—A SIDEBOARD FOR A DINING-ROOM.—DESIGN FOR A CATHEDRAL ORGAN CASE AND SCREEN.

OUR LITHOGRAPHIC ILLUSTRATIONS.

CHATEAU DE LA JOVARDAYE.

The Chateau of La Jovardaye, which we illustrate, is situate in the district of Brittany known as the Morbihan. It is an interesting example of a semi-fortified residence. The entrance-court is inclosed by a lofty wall, with angle bastions, having a *chemin de ronde*, and openings for firearms. A lofty tower rises to the north and advances beyond the line of building, so as to enfilade the rear of the house. The garden and orchard are also inclosed by lofty walls. In the former stands the domestic chapel of the chateau. The earliest portion of the house may date *circa* 1530. Drawings for the north wing were made many years ago by Mr. Goldie, sen. who also built the tower and spire of the adjoining village-church. The present design for restoring the east wing is by Mr. Edward Goldie, and after his drawing exhibited in the Royal Academy this year.

NORTHAMPTONSHIRE UNION BANK, WELLINGBOROUGH.

This building was erected in 1878-9, from the designs and under the superintendence of Mr. Edward Sharman, architect, of Wellingborough, by Messrs. Green and Hull, of the same place, Mr. H. H. Packer acting very efficiently as clerk of the works. The outer walls are built of the local red sandstone, lined internally with bricks. The parapet, cornices, string-course, and window and door dressings are of Bath stone, alternated with red Duston stones in arches. The moulded bases of piers are of red Mansfield, with red Aberdeen granite sub-bases. The sills of bank windows are of tooled, and the shafts of columns of polished grey, granite, supplied by Messrs. Macdonald, Field, and Co. The carving was executed by Mr. S. Barfield, of Leicester. The whole of the joiner's work in bank is of English oak. The ceiling is divided into panels by moulded and enriched oak ribs. The lock furniture to oak doors is of bronze, supplied by Smith and Son, of Birmingham. The roof is covered with green slates, and finished with ornamental cast-iron ridge-cresting, supplied by Messrs. Macfarlane and Co., of Glasgow.

NORTHAMPTONSHIRE BANKING COMPANY'S BANK, WELLINGBOROUGH.

This building was erected in 1878-9, from a design by Mr. Edward Sharman, of Wellingborough, selected in a limited competition. The piers between bank windows are of red Mansfield on moulded granite bases, and the heads are of red Ketton; the architect's original intention being to use red Ketton ashlar for the whole of the front, but in accordance with the wish of the directors, Derbyshire-stone was substituted. The parapet, cornices, and window-dressings are of Bath stone. The stone carving is by Mr. Harry Hems, of Exeter, and the carved panels to front doors, by Mr. Barfield, of Leicester. The walls of bank internally are lined with hexagonal grey glazed tiles, and an inlaid panelled oak dado. Angles of recesses are finished with moulded rouge royal and green marble, to receive glazed tiles of walls. The doors, desks, and counter-front are of oak, with inlaid panels to match dado. Moulded pitch-pine ribs, resting upon carved Caen-stone corbels, divide the ceiling of bank into deeply-sunk panels, which are filled in with pitch-pine diagonal boarding. The builder was Mr. W. H. Henson, of Finedon; his son, Mr. G. Henson, of Wellingborough, acting as manager throughout.

O'BRIEN ORPHANAGE, MARINO, CLONTARF.

We this week illustrate the second premiated design in the above competition, particulars of which will be found on p. 52, *ante*. One of the principal conditions was that "The school should be capable at its opening to accommodate 50 boys, but to be so arranged that, if funds permit, it may be enlarged hereafter, to give accommodation to 50 additional." As may be seen from the key plan, the portion to the right of the central block being for advanced pupils, was to constitute the future extension. The upper plan provided four large domitories, with bath-rooms, w.c.'s, master's apartments, and a large prayer-hall or oratory, for morning and evening prayer. The materials proposed were a dark-coloured limestone for the general body of the walls, with white or bluish limestone dressings. The estimated cost was £15,000. The author of the design is Mr. John L. Robinson, Great Brunswick-street, Dublin.

A DINING-ROOM SIDEBOARD.

The drawings of this dining-room sideboard so fully illustrate the design that little really remains to be said. It simply pretends to be an ordinary piece of furniture, with useful cupboards, drawers, and shelves. It is made in hard woods by Mr. Wm. Watt, of Grafton-street, W.C., and the design was furnished by Mr. Edward W. Godwin, F.S.A.

CATHEDRAL ORGAN-CASE AND SCREEN.

I intended the "screen" to be a west-end gallery, and the organ to stand against the west wall, as is the case in all the foreign cathedrals and churches—a position which is undoubtedly the best for a big organ, both for appearance and acoustical excellence. The majority of the foreign cathedrals have a small organ in the choir, for the purpose of accompanying, while the great instrument is placed at the west end. But, of course, these are well-known facts, though this arrangement is almost invariably rejected in England—a very unfortunate thing, in my opinion; though, perhaps, organs on the scale of the Continental ones could not be placed at the west end of our ordinary English churches, on account of the west windows coming down so near to the ground, still, instruments of moderate size and imposing appearance could be put in such a position. The instrument in my drawing is meant for a large church, as I have shown the great 32ft. pedal-pipes in the large towers. The screen, of course, is solid, the panels not being pierced. Such an organ would scarcely hide any architectural feature in a building of the size of Westminster, where the west window has some 50ft. of wall below it.—Arthur G. Hill.

◆

A report was received by the Lambeth Vestry last week from the sanitary committee as to the quality of bricks used in the inside walls of the new buildings on the Elm Park estate, Brixton Hill, in which it was recommended that the vestry call the attention of the Metropolitan Board of Works to the brickwork, which was stated to be contrary to the Amendment Act of 1878. Mr. Fowler stated that the material was extremely bad, and alleged that the builders had not been interfered with in consequence of the district surveyor (a bed-ridden old gentleman) being unable to attend to his duties. The recommendation was agreed to. It seems desirable, in the public interests, that Mr. Fowler's allegation as to the incapacity of the district surveyor should be strictly inquired into.

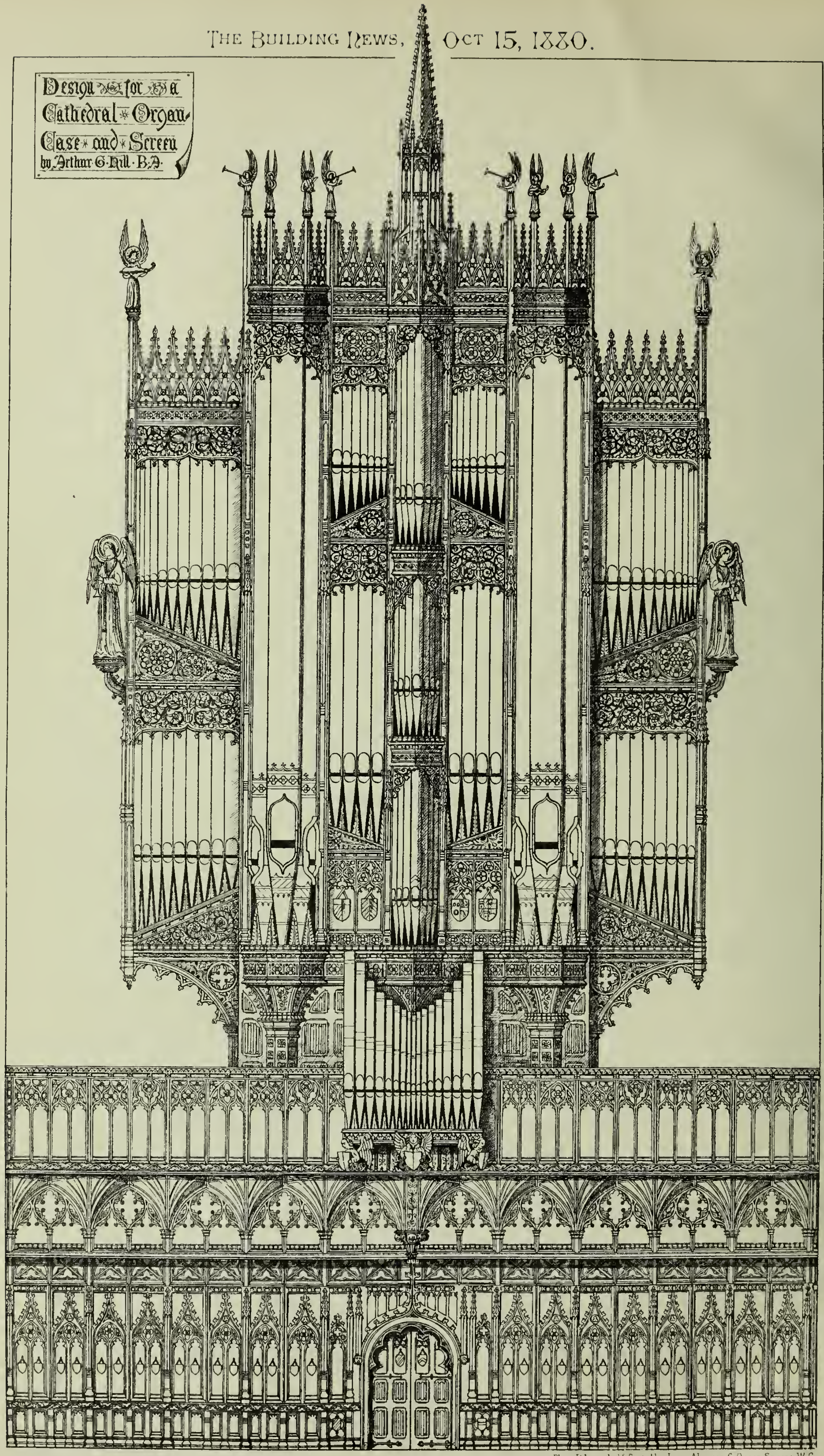
METROPOLITAN BOARD OF WORKS.

At Friday's meeting of this Board a report was read from Mr. G. Vulliamy, superintending architect, on a letter from Mr. R. L. Sibley, district surveyor of Clerkenwell, requesting the Board to determine the amount to be paid to him, as interim surveyor of West Islington, by the incoming surveyors. Mr. Vulliamy reported that Mr. Sibley had acted for 10 weeks since the death of Mr. Moseley; last year's receipts were £1,050, but considering a small portion of the district had been added to Clerkenwell, it would be equitable that the new surveyor for North-West Islington should pay Mr. Sibley £100, and that for South-West Islington £90, in consideration of receiving all fees that may have accrued. The Board then proceeded to the election of district surveyors for the divided district. Thirty-three candidates offered themselves for either appointment. The elections were conducted on the "exhaustive" principle, the candidates being reduced to six in number by a preliminary show of hands. The following lists give the details of voting, a dagger indicating the first half-dozen in the preliminary list, and an asterisk the candidates dropped at successive votings:—

North-west Islington.—Preliminary vote: † Hammond, F., 29; † McDonell, G., 24; † Bridgman, H. H., 22; † Street, E., 22; † Stenning, A. R., 21; † Dale, Dr. R., 20; Large, W. A., 20; Ashbridge, A., 19; Carritt, E., 18; Todd, F., 17; Brooks, C. W., 15; Scrymgour, W. H., 15; Conder, A., 14; Hunter, P., 13; James, Jas. W., 13; Elkington, G., jun., 12; Hewitt, E. R., 12; McLachlan, H., 12; Notley, F. C., 12; Quilter, J. S., 11; Lees, W. H, 10; Ferguson, G. M., 9; Edmeston, J. S., 8; Karslake, L., 8; Mundy, T. E, 7; Smallpeice, W., 7; Pownall, R. E., 4; Taylor, A. T., 4; Grellier, W., 3: Stone, T., 3; Buxton, W. J., 1; and Hanbury, C., 0. In deciding tie for lowest place in six, Dale received 19 votes and Large 14. 2nd vote: Hammond, 28; McDonell, 24; Street, 19; Dale, 16; Stenning, 16; *Bridgman, 9. 3rd vote: Hammond, 29; McDonell, 20; Stenning, 17; Dale, 16; *Street, 12. 4th vote: Hammond, 29; McDonell, 20; Dale, 18; *Stenning, 16. 5th vote: Hammond, 29; McDonell, 23; *Dale, 16. Final vote: Hammond, 22; *McDonell, 12.

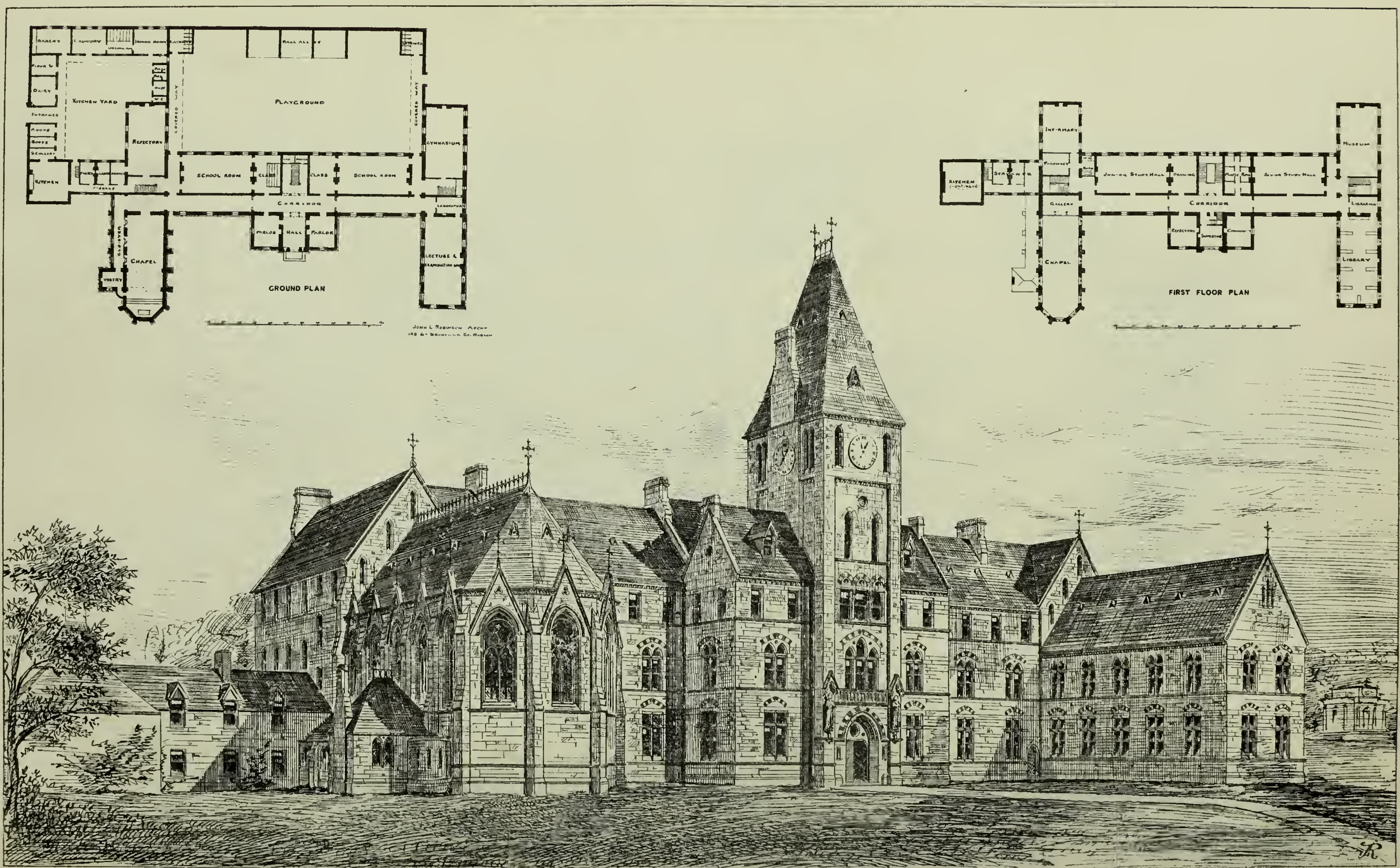
South-West Islington.—Preliminary vote: † Carritt, 22; † Dale, 22; † McDonell, 22; † Large, 19; † Bridgman, 18; † Street, 18; Stenning, 17; Todd, 15; Conder, 14; Hunter, 14; Quilter, 14; Elkington, jun., 13; Hewitt, 13; Lees, 13; McLachlan, 13; Ashbridge, 12; Scrymgour, 12; Edmeston, 11; Brooks, 10; James, 10; Notley, 10; Karslake, 7: Ferguson, 6; Smallpeice, 6; Taylor, 6; Mundy, 5; Stone, 5; Buxton, 2; Grellier, 2; Waine, 2; Pownall, 1; and Hanbury, 0. 2nd vote: McDonell, 21; Dale, 20; Large, 17; Carritt, 16; Street, 15; *Bridgman, 10. 3rd vote: McDonell, 21; Dale, 19; Street, 17; Large, 14; *Carritt, 11. 4th vote: McDonell, 23; Dale, 23; Large, 14; *Street, 13. 5th vote: McDonell, 21; Dale, 17; Large, 17. In deciding tie: Dale, 20; *Large, 15. Final vote: McDonell, 20; Dale, 14.

Messrs. Hammond and McDonell having answered the usual questions, and further agreed to pay Mr. Sibley the remuneration recommended by Mr. Vulliamy, were elected. *Pour encourager les autres*, it was decided not to grant an application of the Shoreditch Vestry for a contribution towards the cost of improvements in Curtain-road and Mintern-street, because they were carried out previously to such application being made. Mr. H. T. Wakefield was appointed, at a salary of £130 a year, to fill a vacancy in the engineers' department, caused by the death of Mr. J. McCleary. The following applications for permission to borrow were granted:—Islington Vestry, £2,800, for purchasing freehold site and erecting stables-keeper's house thereon; Kensington Vestry, £10,657, for wood-paving works; Westminster District Board, £7,500, for wood-paving works; and a loan of £4,000 for paving works was granted to the Vestry of Mile End Old Town. A long-standing dispute was brought to a close, it being reported by the Building Act Committee, with reference to the letter from Mr. R. Walker, district surveyor, as to the construction of the stores of the Civil Service Co-operative Society, at No. 28, Haymarket, that certain works have been carried out for giving additional strength to the building, to the satisfaction of the superintendent architect; and the reference to the committee was accordingly discharged, subject to certain minor conditions being complied with. It was decided to grant Mr. R. Chard's application for a certificate, under the Boards Act of 1878, for a concert-hall and assembly-room, to be called Brixton Hall, Acre-lane, Brixton; and a similar certificate was also granted as to the Royal Victoria Coffee Music Hall, late the Victoria Theatre, in the New Cut, subject to enlargement of exits in Waterloo-road from 3ft. 4in. to 5ft. each, and the straightening of gallery staircase.



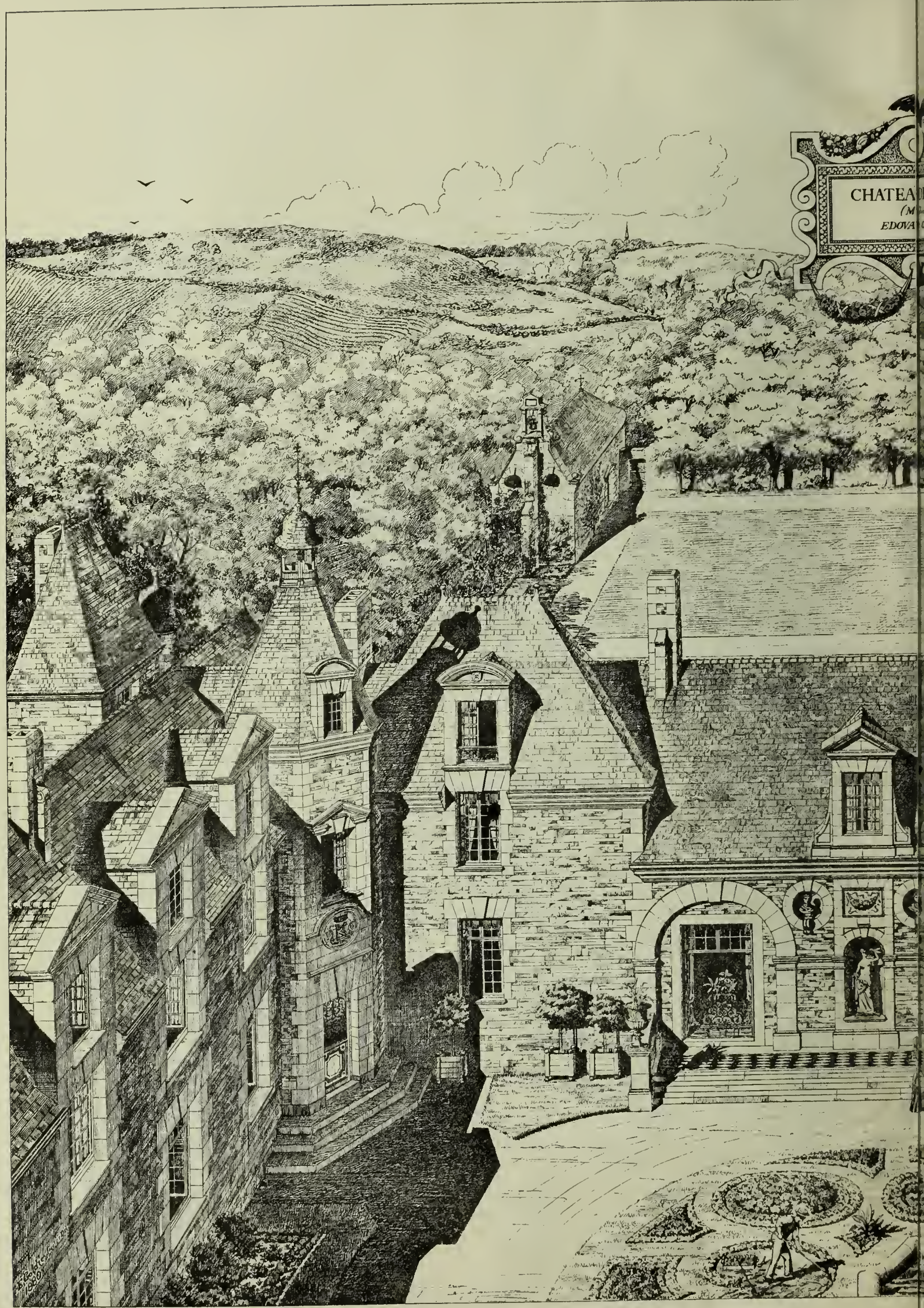
Design for a Cathedral Organ Case and Screen by Arthur G. Hill B.A.

Photo Lithographed & Printed by James Akerman, 6, Queen Square W.C.



THE O'BRIEN ORPHANAGE . MARINO CLONTARF : SECOND PREMIATED DESIGN . John L. Robinson Archt

Photo-Lithographed & Printed by James Akerman 6 Queen Square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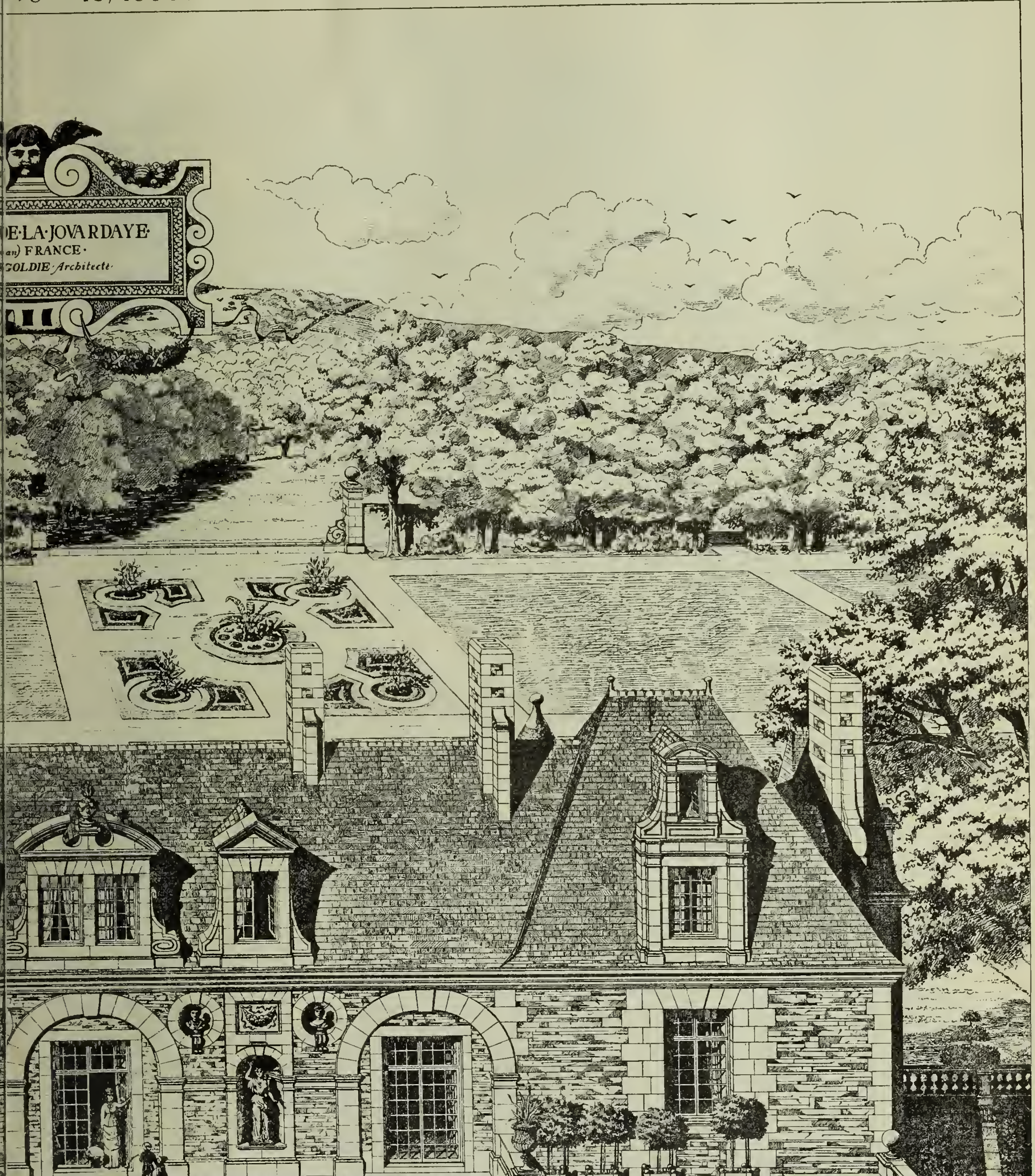

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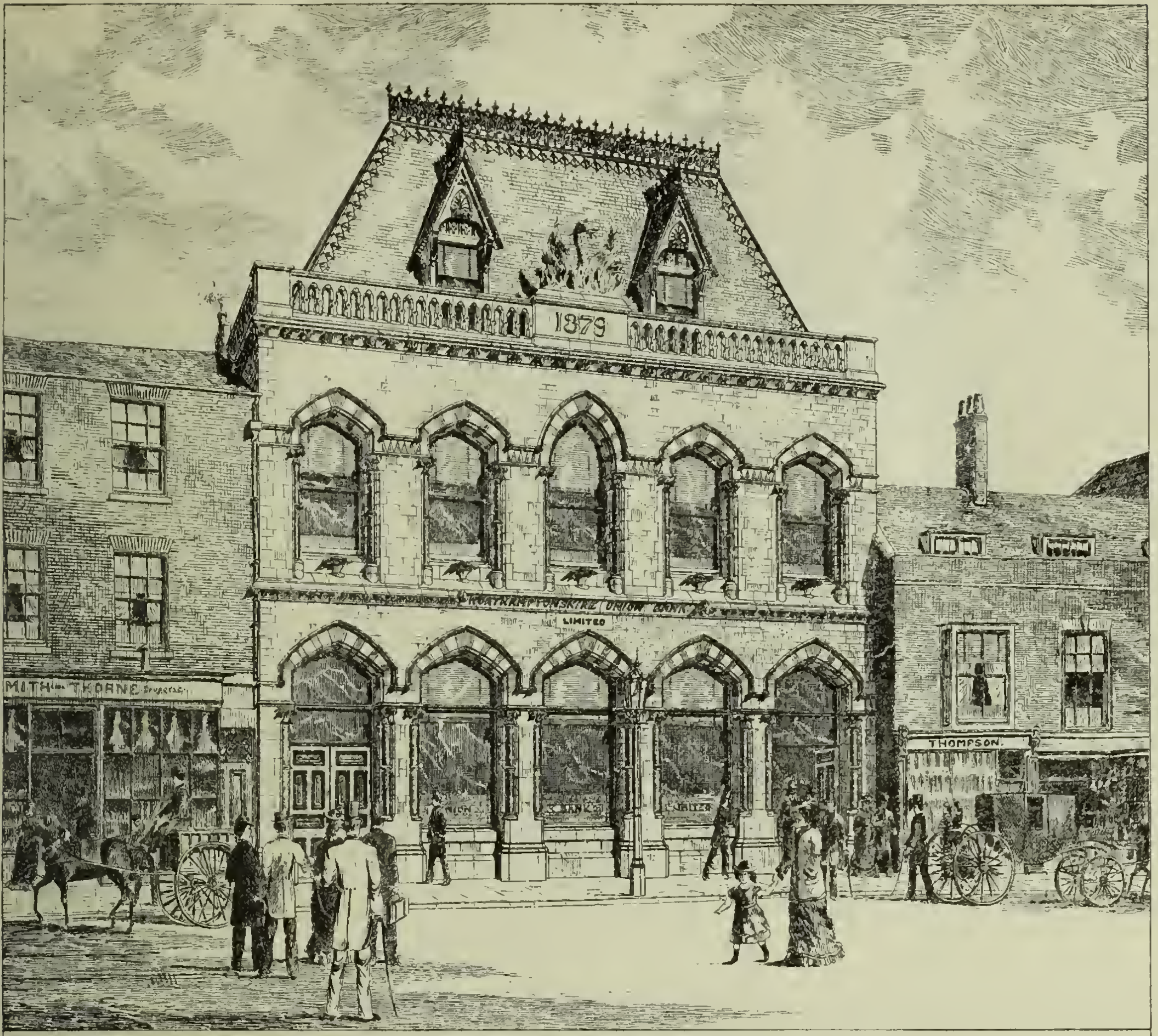
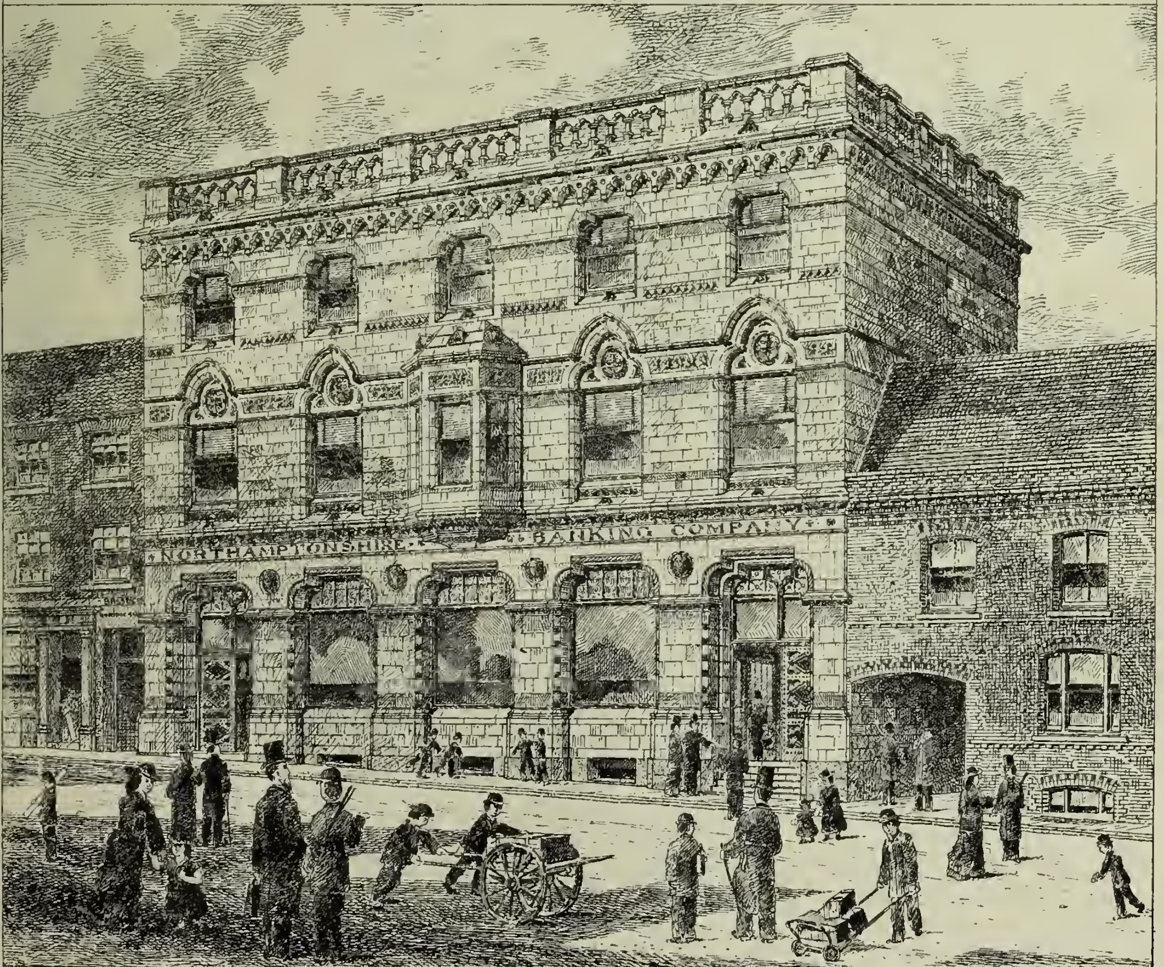
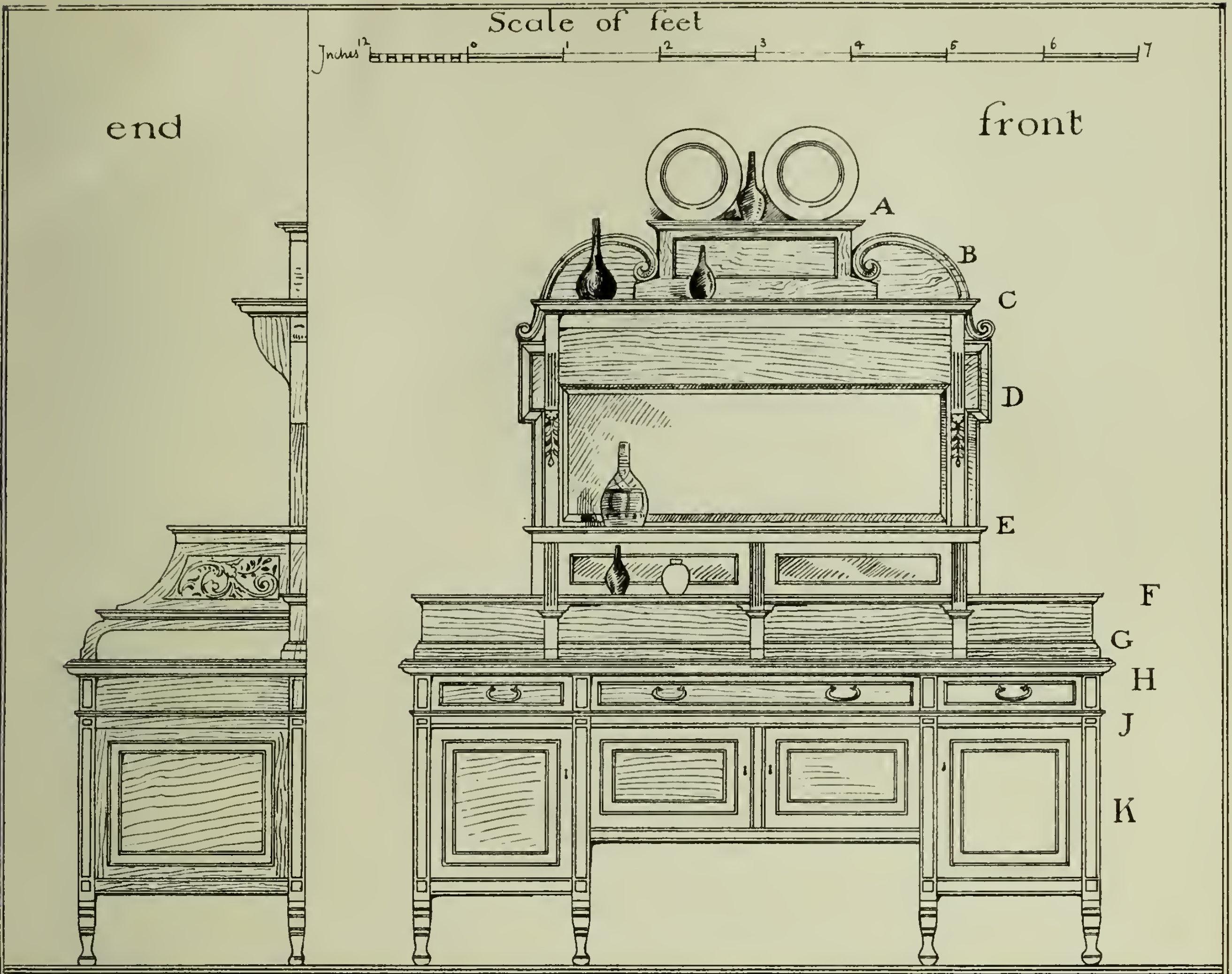


Northamptonshire Union Bank Wellingborough
Bank and Managers Residence

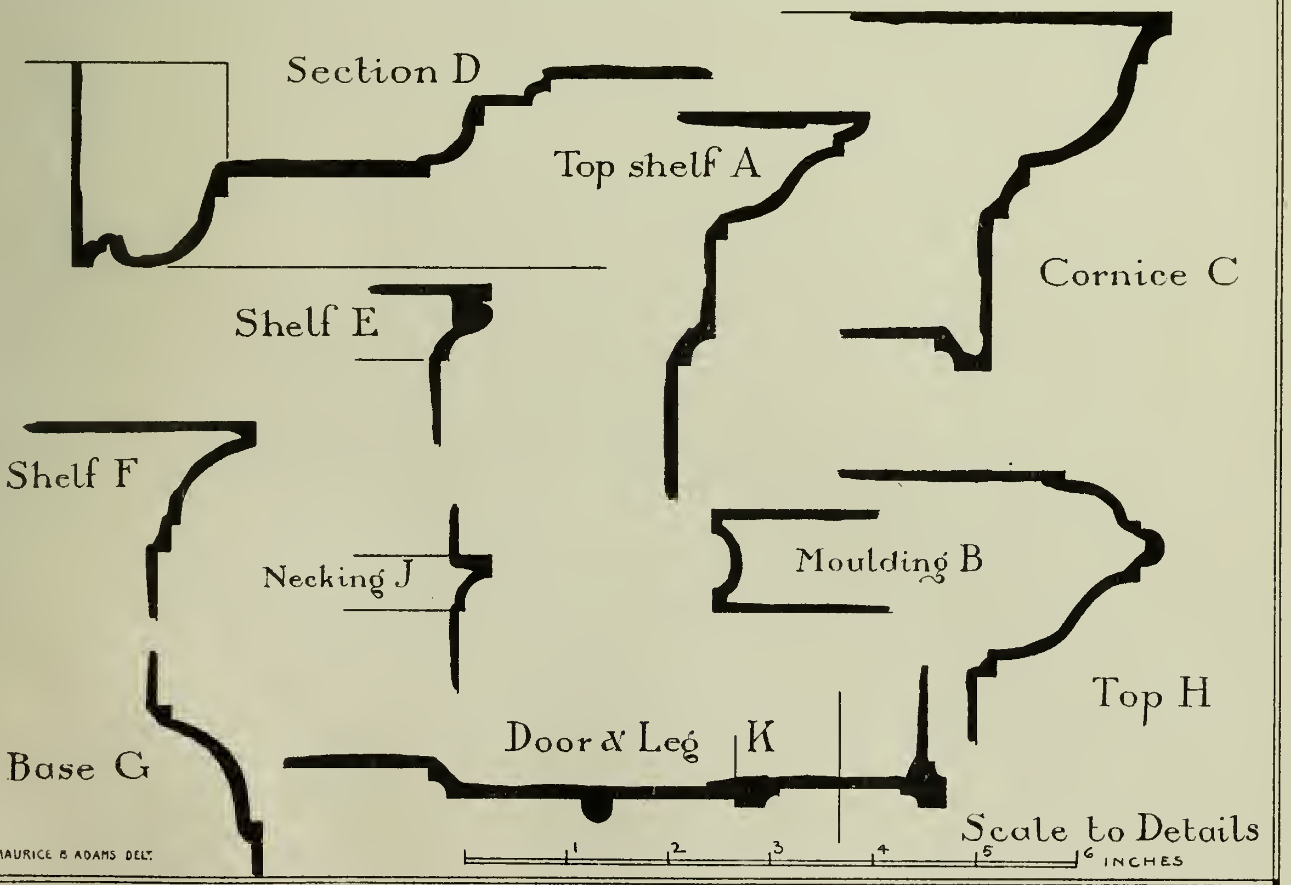


EDWARD SHARMAN WELLINGBORO' *Architect*

Northamptonshire Banking Company Wellingborough ❧
Bank and Manager's Residence



A · SIDEBOARD · FOR · A · DINING · ROOM · BY · E·W·GODWIN · F.S.A.
MADE BY Wm. WATT.



MAURICE B ADAMS DELT.

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ST. ALBAN'S ABBEY.

MR. HENRY J. TOULMIN, Hon. Sec. St. Alban's Abbey restoration committee, states, in a letter to the *Times*: "That Sir Edmund Beckett has now given orders under a faculty lately granted to him to destroy Abbot Wheathampstead's west window (of the date of Henry VI.), and to replace it with a window of his own composition, which may be exceedingly effective to those who admire the high art of the 19th century, but extremely distasteful to those who respect bygone times and the historical associations of this ancient Abbey.

"If the Society for the Protection of Ancient Monuments, aided by a small public subscription, would now proceed against and obtain an injunction, they would," in Mr. Toulmin's opinion, "prevent this iniquitous proceeding, as Sir Edmund's faculty was to repair the west front, and not to destroy any portion of it. Sir Edmund is carrying out his own wilful way against the remonstrance of his bishop and the wish of the archdeacon, rector, churchwardens, and sidesmen of the Abbey church; and a petition signed by the Lord-Lieutenant and many of the leading inhabitants of the city of St. Albans and its neighbourhood has lately been sent to the bishop of the diocese requesting him to interfere. Even a lavish expenditure of money from ample resources in this pseudo-restoration will hardly recompense the men of Hertfordshire for the injury done to their great county church. A sum of £400 to £500 would be, I believe, sufficient to repair the window to make it last for a great many years to come. I may say Mr. John Scott, whom Sir Edmund promised to consult (but on such terms as no leading architect could submit to), deprecates and deplores this iconoclasm as much as we do."

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CHEPSTOW CASTLE.

IN an antiquarian paper, a writer in the *Saturday Review* remarks: The castle stands on the irregularly sloping-edge of a lofty limestone cliff, that rises perpendicularly from the Wye, by which river it is defended on the north; the other sides being secured by a deep dry moat. The noble architectural remains, though the towers and halls are roofless and floorless, are sufficiently entire to recall the walls that in 1656 confined Jeremy Taylor, the Chrysostom of English divinity. Of the former strength of the fortress there is yet visible evidence. The outer walls contain enough completeness to prevent entrance except by the massive eastern gateway. This is of the period of Edward I.; and entering between its bold round towers, we find a grass-covered court, sixty yards long by twenty broad, which is succeeded by three other courts of narrower proportions, the whole fortress having been constructed in adaptation to the natural ridge on which it stands. Though there is some Roman masonry in the structure of the great west gate, we need give no more credence to Stowe's assertion that the castle was first built by Julius Cæsar than to Leland's report that a tower called Longine was "erected by one Longinus, a Jew, father of the soldier whose spear pierced the side of Christ." To the right of the eastern or principal gatehouse are the offices, including the kitchen and lesser hall (temp. Edward II.), some of which apartments are inhabited by the custodian of the ruins. To the left is an ivy-draped building, outwardly perfect, called Morten's Tower. This is an Early English work, and contains in its upper chamber the lord's oratory—a beautiful 13th-century chamber, with a fine window enriched with rose ornament. Beyond the second court, which has been planted as a garden, stands FitzOsbern's Norman keep, or what remains of it, a good deal of Early English work, including some fine details in the clustered columns of the windows of the great banqueting-hall, having replaced the earlier structure. Beyond the great hall is another courtyard, and, finally, the back gatehouse.

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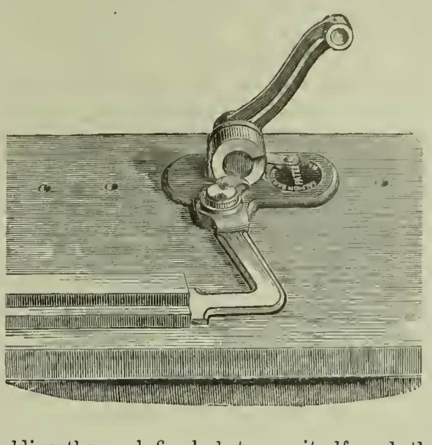
JOINERS' PATENT BENCH-KNIFE.

MESSRS. SALMON BARNES AND CO., of Ulverston, are introducing a very useful tool under the above name. It is compact, cheap and secure, and can be used without any loss of time, as the work can be secured or released instantly by a touch of the lever. It is superior in many respects to the old bench dogs in present use.

It consists of a very small bedplate (having two pins on the underside to drop into holes in the top of bench), and an arm or knife for holding the work firmly between itself and the bench-hook; this arm or knife is pushed against the work by the action of the small lever handle and cam. The dimensions are only 3½in. in width, by 9in. in length, over all, and as the knife is made in a very compact form, it is not in the least in the way on the bench. The weight is only 2lb. so that it can be comfortably carried in an ordinary joiner's kit.



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PARQUET AND MOSAIC FLOORS.

AS a recently revived industry, the manufacture of parquetry has made great progress of late years. But, like other decorative manufactures, we have real and sham kinds of parquetry. Architects and builders are indebted to their brethren in Hungary and Germany for improved methods of timber flooring without nails, and the Hungarian parquet flooring, which has lately forced its way into the market by its quality and low price, deserves the attention it is receiving. We have just had occasion to inspect some capital solid Hungarian parquetry which has been laid in the great hall of the Merchant Taylors' Company, in Threadneedle-street, by Mr. Jos. F. Ebner, of 51, Clerkenwell-road. This parquetry is manufactured abroad by steam-machinery at a very reasonable price, and is one inch solid. The pattern in the centre of hall consists of squares sub-divided into panels and placed diagonally, entirely of oak, with a parquet border of the same design, but laid square and relieved by marginal inlays of walnut. A very excellent and effective floor has been produced at a low price—we think about 1s. 7d. a foot super. The squares are grooved together with tongues without glue, and the work is wax-polished. Mr. Ebner, on his new premises opposite the Italian Church, Hatton-garden, has a large assortment of patterns for parquetry floors and borders, suitable for every purpose the architect can desire, from the plainest oak batten or herring-bone pattern to the richer geometrical design of inlaid walnut and white ash. Nothing can be more true and perfect than some of the examples of this solid grooved work. The borders manufactured are as various as the centres. We see specimens of plain panels formed by dark walnut and white Hungarian ash, 8in. wide, from 1s. 11d. per foot super.; ribbon, and fret, and interlacing patterns from 2s. 6d. to 3s. 8d. The Greek fret pattern, with ash lines on the oak, is a very pleasing border, suitable for a hall or passage. We find the price is marked 2s. 2d. a foot, or the same pattern, with dark walnut lines, is 2s 6d. Plain oak polished parquetry can be laid at a cost of 12s. a yard; while for 2s. and 2s. 2d. per foot square a handsome floor, superior in manufacture, of geometrical design in oak, walnut, and white ash, can be laid. Some of the star patterns, and those with ash and walnut intersecting squares, are very effective floorings. We may add that prepared batten flooring can be laid on joists, and the price in oak is 9d. per foot. The squares of parquetry can be supplied to any requirements or design, but the stock patterns are to be had made up from 1ft. to 3ft. super, and the battens are made 3ft. long by 3in. and 5in. wide. As the squares are already grooved round the edges, a skilled joiner can readily lay a floor without the inconveniences attending the use of glue.

The old Jerusalem Coffee House, now "The Bodega," in Cowper's-court, Cornhill, has been lately rebuilt, and the basement, set apart for the wines, has been laid with marble mosaic paving, by Mr. J. F. Ebner. The main area is of white tesseræ, and the border has been laid of harmonious mixed colours (meschiato), producing an extremely durable and pleasing floor, not the least merit of which is the reflection of the light from the surface. The advantage of mosaic paving for public restaurants and bars over wood floors, and even tile, is obvious: it is impervious to damp, does not wear hollow like tile floors, and can be kept clean with less labour than other kinds of paving. We observe other improvements in the luncheon-bar; one of these is an ingenious method of raising the barrels from below by the use of hydraulic power, so that as each barrel becomes empty, another one takes its place on the stand without the labour and inconvenience of lifting the barrel off, and rolling another to its place. One advantage of the arrangement is that the ales are not shaken. The "champagne refrigerator," also an invention of Mr. Hayes, the manager, forms a novel feature in the bar. It is a circular rack for bottles, having a cylinder up its centre containing a spiral tube, through which water (iced) is made to ascend and trickle over a bell-shaped spreader at the top through the various tiers of bottles. The arrangement of the racks and casks along the side walls, and a very pleasing chimney-piece with tiles and over-mantel, add to the effect.

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UNHEALTHY HOUSES.

ON Monday night Dr. A. Maxwell delivered the second of a series of "Medical Talks" at the Young Men's Christian Association, 186, Aldersgate-street, the subject being, "Dangers to Health; or, Unhealthy Houses." Dr. Maxwell said some years ago this country was afflicted by what was called the black death, sweating sickness, and plague. These diseases were not known at the present time, but we did still occasionally hear of cholera. People used generally to trace these terrible epidemics to a supernatural origin, but they would find the explanation much nearer home in the habits and surroundings of the people. Amongst the diseases generated by unhealthy houses were typhoid fever, diphtheria, diarrhœa, headache, and rheumatism, and in case of epidemic, those occupying unhealthy houses were much more likely to succumb than others. Having referred to the evils arising from damp houses, the lecturer said there were three conditions to be fulfilled in a healthy dwelling—first, it must be dry; second, there must be no foul air, but plenty of fresh air; third, there must be no foul water, but plenty of good water. He directed attention mainly to the question of drainage, which he said was a subject very much neglected, as unpleasant to dwell upon, but which was really far more important than the artistic mouldings of the drawing room, as without health the peace and comfort of the home were destroyed. With the aid of diagrams Dr. Maxwell illustrated the usual sanitary arrangements of a house, and explained how it was that disease frequently arose. As a rule there was only one cistern, so that the noxious gases generated in the drainpipe found their way into the water that was used for drinking and household purposes. Frequently there was no trap in the pipe leading from the sink to the drain. The evil was increased when the drainpipes passed through and under the house, as it generally happened that there was some leakage either at the joints or through cracks in the pipe, and the bad odour was thus introduced to the house. It was most important to have two cisterns in a house, one of which should be exclusively used for drinking and household purposes. It was also necessary to have a ventilating pipe connected with the drain, so that the foul air could be carried away at the top of the house. He concluded by referring to the question of ventilation. A cordial vote of thanks was passed to Dr. Maxwell at the close of the lecture. A number of sanitary appliances were kindly lent by Messrs. Doulton and Co., of Lambeth, and Messrs. J. Tyler and Sons, of Newgate-street, for the purpose of illustrating the lecture.

COMPETITIONS.

Bayswater.—In a limited competition for rebuilding St. Matthew's Church and vicarage, Bayswater; the committee unanimously selected the design submitted under the motto "Columns Avoided," the author being Mr. John Johnson, architect, 9, Queen Victoria-street, Mansion House, E.C. It is proposed to proceed with the church as soon as possible, the estimated cost of which, with tower and spire, is £16,000, and the vicarage £3,000. The existing church and vestry will be retained for use as long as possible, to avoid the cost of erecting a temporary church or dispersing the congregation. Messrs. Dove, Bros., builders, of Islington, London, will carry out the works under the superintendence of the architect. Mr. H. S. Legg, architect, of Christ's Hospital, was, we believe, the other competitor, Mr. Wm. Emerson, and Mr. Pearson, A.R.A., having declined to engage in the competition.

Dundalk Water Supply.—The town improvement commissioners have offered to civil engineers a premium of £100 for the set of plans proposing the best source, and least expensive in execution, for a water supply to a population of about 20,000. The competition will be decided by the Improvement Commissioners themselves, subject to the appointment of the engineer-in-chief of the Local Government Board, and it is expressly provided that the premium will only be paid in the event of the source and plan being adopted by the Commissioners, and finally approved by the Local Government Board's engineer. Plans, reports, and estimates of total cost, and supply per head, are to be sent in by to-morrow (Saturday).

Glasgow Municipal Buildings. — At the meeting of the Glasgow Town Council on the 7th inst., the Municipal Buildings Committee reported that they should refer the question to the Town Council for instructions before proceeding in the matter. The Lord Provost then moved that the discussion on the designs and report be adjourned for a week, and Bailee Scott, in seconding this, amidst impatient protests, offered a correction as to the probable cost of the enterprise. It had been said that the municipal buildings would only cost £150,000, according to the conditions of the competitions; but the real cost would be between £400,000 and £500,000, as the sum of £160,000 had been expended on the purchase of site, and it would cost £100,000 to furnish the buildings. The discussion was then adjourned.

Leyton Public Offices.—The local board of Leyton, E., agreed last week to have a limited competition for the proposed public offices. The chief feature is to be a hall containing from 1,500 to 2,000 superficial feet, and the cost of erection of this and the board-rooms and offices is limited to £4,000. Premiums of 25, 15, and 10 guineas are offered respectively for the three best designs, the first of these to be merged in the commission of 5 per cent. should the building be carried out by the author of the selected design.

The Rowland-Hill Memorial Statue.—At a meeting of the Rowland-Hill Memorial Fund Committee held on Friday, it was announced that the following sculptors have been selected to compete for the statue proposed to be erected at the south-east corner of the Royal Exchange: Messrs. Birch, A.R.A., Eli Johnson, E. R. Mullins, J. H. Thomas, Charles Bacon, Adams-Acton, Keyworth, Williamson, E. O. Ford, Bruce-Joy, and Forsyth.

Whitby Harbour Improvement Scheme.—Last week, at a meeting of the trustees of the Whitby Piers, the clerk (Mr. P. G. Coble) reported that, in compliance with the Board's instructions, he had invited Mr. Messent, engineer for the Tyne Commissioners, to inspect the various plans sent in for competition for the premium offered by the trustees for the best plans, with sections, reports, and estimate of costs for improving the harbour at Whitby, and that gentleman had promptly agreed to do so. Mr. Coble produced the report of Mr. Messent, in the course of which he said he was guided in his judgment as to the plan best adapted to the requirements of Whitby, namely: — 1st. To remedy the dangerous entrance by preventing or largely reducing heavy seas entering the harbour and the range of the sea within it; 2nd. To increase the depth of the entrance, so as to enable the harbour to be taken more safely, and thereby save loss of life and property in bad weather and strong seas; 3rd. To stop sand from washing into the harbour, especially from the westward, and being as at present injuriously deposited within it between the entrance and the Scotch Head; 4th. To rectify the crooked channel from the bridge to the entrance, and substitute a safer and deeper one to sea; the amount calculated for expenditure not to exceed £40,000. These were the principles on which he had grounded his decision, which was that the plan best adapted for the requirements of Whitby was No. 4. This proved to have been sent in by Mr. Sandeman, engineer, of Newcastle-on-Tyne. On the motion of Mr. G. W. Elliott, M.P., seconded by Mr. Falkingbridge, the Board unanimously agreed to adopt Mr. Messent's recommendation, and Mr. Sandeman's scheme was accepted accordingly, and the secretary was instructed to forward that gentleman the £50 which they offered. In the event of Mr. Sandeman's plan being approved by the Public Works Loan Commissioners and the Board of Trade, and a loan being granted by the said Commissioners to carry out the works, the successful competitor will have a further sum of £50 for his plans, and be retained as engineer to superintend the carrying out of the works on the usual terms.

SCHOOLS OF ART.

Guildford.—The distribution of prizes and certificates in connection with the Guildford Science and Art classes, took place at the Eastern Hall on Wednesday week. The report stated that good prizes had been made in the past year, and that the teacher, Mr. Farnfield, had qualified for a bronze medal of the Department in 1st class honours for agriculture. 300 attended the classes during the year, and 248 candidates took part in the May examinations; there were 93 successes, 14 of which were in art classes, and one candidate, Ernest Marshall, of Godalming, had passed in all four art subjects during the year. A number of local prizes had been subscribed for, and were distributed by the Mayor.

Newcastle-on-Tyne.—On Monday night the annual distribution of prizes in connection with the Bath Lane Science and Art School was made by Mr. Joseph Cowen, M.P. Dr. Rutherford read the report of the school for 1879-80, which stated that the day-school had steadily increased in numbers. There were 180 on the registers, of whom more than 90 had passed the sixth standard. The results of the science and art examinations in May last would bear comparison with those of any secondary school in the North of England. The report referred to the fine art and industrial exhibition held during the holidays, and the thanks of the committee were accorded to the Mayor and Sheriff of Newcastle, and others, for their invaluable services. The progress of the School of Science for the year was seen in the fact that Mr. Cowen had 135 Queen's prizes and 172 certificates to present, as against 86 and 163 presented last year by the Marquis of Hartington, and 53 and 129 presented in the preceding year by the Earl of Ravensworth. The London University Matriculation classes had been attended by fifteen students. Since the commencement of the School of Science and Art, three years ago, 1,257 names of students had been entered on the general register.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Glasgow Architectural Association. — At the usual monthly meeting of the above Association, held on the 5th inst., the secretary read a letter from Mr. Honeyman, honorary president, stating that he had succeeded in obtaining the names of six gentlemen for the series of lectures on practical subjects to be commenced this winter. The following is the programme:—

1880.		
Nov. 16.	Mr. Jas. Thomson ...	"Foundations."
Dec. 21.	Mr. John Honeyman	"The Building of Walls."
1881.		
Jan. 18.	Mr. Jas. Salmon	"Drainage and Ventilation."
Feb. 15.	Mr. John Baiid.........	"Roofs."
Mar. 15.	Mr. John Burnet	"Floors and Partitions."
April 19.	Mr. David Thomson	"Interior Arrangements."

All the lecturers are Fellows of the Royal Institute of British Architects.

Building Intelligence.

Brynamman, Carmarthenshire.—The foundation-stone of the new church about to be built here has been laid. The plan of the building consists of a nave 55ft. by 25ft., 18ft. high to plate, and 36ft. to ridge, the pitch-pine roof being open all the way up, and plastered between the rafters, the principals arched and supported on Bath stone moulded corbels, a chancel 26ft. by 16ft., with arched, ribbed, and boarded ceiling, a vestry with heating-vault below, and organ-chamber; also a porch, vestibule, and baptistry arranged side by side, forming a kind of narthex at the west end, which will have a suitable bell-turret above. The walls are to be built of local stone, with Westwood ground dressings, and the roofs covered with grey Whitland Abbey slates. The pitch-pine seats will be of open description on wooden platforms, the passages and chancel being laid with encaustic tiles. The whole outlay will be £1,500, and the number to be accommodated 300. The architect is Mr. E. H. Lingen Barker, and the contractors Messrs. Balcombe and Price, of Pembroke Docks.

Cawood, near Selby.—The union rural sanitary authority of Selby are constructing a new cemetery, consisting of chapel, lodge, entrance gates, boundary walls, and the laying-out of the grounds. The plans have been prepared by Messrs. William Lewis and Son, of 46½, Stonegate, York, architects, and the contractor for the whole is Mr. Thomas Hiusley, of Carlton, near Selby. The style of the chapel, &c., is Early English; the chapel is divided into two parts by a cross wall running up to the roof, making two distinct chapels inside. Labels, with ornamental terminations round the whole of the doors and windows, the carving of which will be executed by Mr. G. Milburn, of York, from the designs of the architects, and will represent some of the Ecclesiastical history of the town, Cawood being, at one time, the residence of the Archbishops of York, who had a magnificent palace, in which Cardinal Wolsey was arrested.

East Ardsley.—The foundation-stone of the new church of St. Michael, East Ardsley, near Leeds, was laid last week. The new building will consist of nave, chancel, and north and south aisles. There will be a tower at the west end, an organ-chamber on the north side of the chancel, and clergy and choir-vestries on the south side. An old font, dated 1663, will be again used. The dimensions of the new building will be as follows:—Nave, 58ft. 2in. by 20ft. 2in.; aisles, 58ft. 2in. by 10ft. 6in.; height of nave, from floor to apex of roof, 34ft.; chancel, 25ft. 9in. by 17ft., height, 29ft. 6in. The style of architecture will be Perpendicular Gothic, 14th century. The new church is being erected from designs prepared by Mr. W. S. Barber, of Halifax.

Gloucester and Bristol Diocesan Association.—At the autumn meeting of this association held at the Royal Hotel, Bristol, on Tuesday week, the following grants in aid were made:—Churches — Whiteshill, £80; New Swindon, (new church, first portion) £180; Hartpury, £80; Brimscombe, £50; Easton St. Mark, Bristol (mission-chapel), £80; Crudwell, £60; Bristol, St. Jude (mission-chapel), £50, total £180. Schools—Gloucester, St. James, £40; Blunsdon, St. Leonard, £15; Minchinhampton, £20; Bristol, St. Luke, 20; Oakridge, £5; Cheltenham, St. John, £25; Colerne, £10; total, £135.

Hungerford.—For some months past the parish-church of Hungerford has been undergoing renovation. The pews have given place to open seats. New arcades, pillars, clerestory walls and window have been built, the latter being filled with foreign glass. A new organ has been erected at a cost of £510. The alterations and improvements have been carried out by Messrs. Morris and Stallwood, architects, of Reading, Messrs. Wooldridge and Son, of Hungerford, being the contractors. The total estimated expenditure, including the cost of the organ, is £2,917.

Llanrwst, North Wales.—A new bank for the North and South Wales Bank has lately been erected by Mr. Samuel Parry, builder, Llanrwst, at the north-west corner of the

Market-place. Above the bank are arranged suites of offices, and a large public hall, devoted to the use of the county court, magistrates' meetings, and also public entertainments. The style of the building is English Domestic Gothic. The materials used were local stone for the walling-stones, and Runcorn stone for the dressings. Half-timber work has been employed in the upper stories. Mr. Edmund Kirby, architect, Liverpool, supplied the designs and superintended the works.

Longton.—The foundation-stone of new public baths has been laid at Longton. Plans for the building were prepared by Mr. Arden Hardwicke, C.E., the borough engineer. The style of the building will be Gothic. Provision is made for three good swimming-baths, two being devoted to gentlemen and one for ladies. The roofs of the swimming-baths will be lighted from above by Shelly's patent system of glazing. The general work in the laundry department will be done by Messrs. Bradford and Co., of Salford, under contract, for £750. The tank-room is situated above the laundry, and will contain three large tanks. The superintendent's apartments will be on the first floor. The builders are Messrs. H. and R. Inskip, of Longton, whose contract is £5,900.

Over Darwen.—The foundation stone of a new market-house at Over Darwen was laid on Saturday week. The architect of the new market-hall, whose designs were selected from a number of others sent in for competition, is Mr. C. Bell, of Union-court, Broad-street, London. There will be four entrances to the building—one from School-street, one from Market-square, and two from the wholesale market on the left side—but the principal front will face Market-square. The market itself will have an area of 60ft. by 120ft., and will be covered by a light iron roof in semi-circular spans. On the north side there will be six butchers' shops, facing the market area, and on the south side six shops will be provided for various trades. At the west entrance space will be left for six fish-stalls. Over the shops there will be an extensive suite of rooms, with a separate staircase entrance from Market-square. The principal entrance to the hall will have a projected oriel window, and a bell turret will rise to a height of 80ft. from the ground. The work is being carried out by Messrs. Orrell and Sons, builders, Darwen. We illustrated the building at the time of the competition.

Partick, N.B—The memorial-stone of Dowanvale Free Church, now in course of erection at Partick, near Glasgow, was laid on Saturday afternoon. It is Early English Gothic in style, and is being built of square dressed rubble. On the ground floor are planned a suite of rooms 16ft. in height, including a hall seating 300 persons, session-house for 100 persons, vestry, ladies' room, and lavatories. Over these rooms is erected the church proper, which will seat 500 on the area, and 300 more on a gallery carried round three sides. Mr. Petro is the architect.—The memorial-stone of a new Wesleyan church in course of erection at Dumbarton-road, Partick, was laid on Monday. The style of the building is 13th-century Gothic. The architect is Mr. McGibbon, of West George-street, Glasgow, and the clerk of works Mr. James Mair.

Ramsbottom.—The church of St. Joseph, Ramsbottom, was opened on Thursday, Sept. 30, by his eminence Cardinal Manning. It is a clerestoried building designed in the Early Gothic, Geometric period, and when completed will consist of nave, north and south aisles, chancel and sacristies, with tower and spire at the south-west corner; at present only the nave and aisles have been erected. The nave is 70ft. long by 21ft. wide, and 42ft. high to the ridge of the vaulted roof, and the aisles 11ft. 6in. wide, which are divided from the nave by an arcade of four arches, supported on Yorkshire stone columns with moulded caps and bases. The church is seated with open benches and will accommodate about 500. The cost of the church, as at present erected, is about £2,500. The whole of the works have been carried out from the designs and under the superintendence of Mr. Clifton W. Whittenbury, of the firm of Bird and Whittenbury, architects, of King-street, Manchester.

Scissett.—St. Augustine's Church, Scissett—which has been undergoing alterations and additions—was recently reopened. The nave has been reseated with pitch-pine polished benches. The aisles are ornamentally tiled, and the walls covered with polychromatic decorations. An apse-shaped chancel and two diagonally cruciform chapels have been built. The former east wall has been pierced with three Early English arches, opening chancel to the body of the church, and the two side arches partly filled into the springing with tracery and carved screens. Similar arches and screens are placed on the north side of the aisles and chancel. The north chapel is used as a choir and clergy vestry, and the south chapel is used as an organ-chamber. A carved oak pulpit, executed by Mr. Burton, of Clayton West, from the architects' designs, stands out prominently. The whole of the alterations and additions have been carried out from designs by and under the superintendence of Messrs. John Kirk and Sons, architects, Huddersfield and Dewsbury, and, exclusive of the gifts, will cost about £1,400.

Walton-le-Dale.—Last Sunday, a new Catholic church, at Walton-le-Dale, was opened by the Right Rev. Dr. Hedley, O.S.B. It consists of nave, chancel, side chapels, and aisles, and the style is of the Early Decorated period. It is built with hollow walls, the inside being of brick, the outside faced with Yorkshire pierpoints. The whole of the dressings, both exterior and interior, are of Stourton stone. The total length is 96ft., the width across nave and aisles, 53ft., and the height to ridge is 52ft. It has been erected from the designs of Messrs. Pugin and Pugin, by Mr. W. Hothersall, contractor, of Preston. It will accommodate over 500 people. The amount of the contract, including benches, was £5,223. The altar and marble floor in chancel have been executed from the designs of the architects by Mr. Isaac Sherratt, sculptor, of Preston.

CHIPS.

The council of Cambridge considered on Thursday week a report as to the lighting and ventilation of the large chamber at the Guildhall, prepared by Mr. F. W. Porter, of Russell-square, London, W., and adopted the greater part of his recommendations at an estimated cost of £300. The correspondence read at the meeting included an inquiry, by the committee, if Mr. Porter's attention had been specially directed to Tobin's system of ventilation, and a reply from the architect stating that he had adopted the method many years before he heard of Mr. Tobin's name in connection with it, and that amongst the contrivances he proposed for ventilating the orchestra was one which, in effect, was "the system known as Tobin's."

The *Antiquary* has commenced a series on "The Victorian Revival of Gothic Architecture," by Mr. J. H. Parker, C.B. He has "no hesitation in saying that the restorations of the Victorian era have, *on the whole*, done a great deal more good than harm."

Professor Churchill Babington has announced his intention of resigning the Disney professorship of Archæology in the University of Cambridge. He has held the post since 1865. The election of a professor to the vacant chair will take place on the 28th inst. The Professorship of Archæology was founded in 1851 by Mr. John Disney, of the Hyde, Ingatestone, who, during his lifetime, nominated the professor. The appointment is now vested in the Vice-Chancellor and the heads of houses, or their *locum tenentes*. The professor must be a Master of Arts of the University of Cambridge, and his duty is to deliver six lectures at least during the academical year on the subjects of classical, mediæval, and other antiquities, the fine arts, and all matters and things connected therewith. The professorship is tenable for five years, but the holder is capable of being re-elected. The value of the professorship is about £96 per annum.

The Architectural Association Sketch-book Committee, having just completed the 12th volume, have determined to start a new series, though some were inclined to terminate the sketch-book publication altogether, on account of the difficulty which has for some time been experienced in obtaining suitable sketches lithographed ready for insertion. A new editor has been appointed, and a series of sketches by new members who have not hitherto contributed seems to have given new life to the work.

A new Presbyterian church at Westbourne, Ballymacarret, erected at a cost of £2,800, was opened on Sunday.

The new bridge at Southease, erected by the Newhaven harbour trustees, has just been completed. It is of iron, is constructed to bear a moving load of 20 tons, and has cost £2,725. Mr. Henry Wallace was the engineer.

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[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Edw. W. Robb. (Series of articles on some of the trades—such as plumbing, for instance—have appeared in back volumes, but none of them can be had complete.)

Correspondence.

QUANTITIES.

To the Editor of the Building News.

Sir,—The paper on this subject, read by Mr. Hughes, and the correspondence thereon, possess considerable interest for quantity surveyors, and are, therefore, my excuse for troubling you with this communication, hoping thereby to contribute something towards solving, at least, one of the difficulties connected with the subject.

It is much to be regretted that whenever the quantity question is raised so much ill-feeling should be shown—as may be seen, for instance, in a portion of the correspondence referred to: it does no good, in fact it only widens the breach between the respective parties, and lowers all in the public estimation.

I cannot but think that if architects, surveyors and contractors, who are the persons most interested in the matter, were to make a united effort, the principal, if not all, the difficulties could be got over.

What are the difficulties? We may take it for granted that quantities are a necessity in this age of competition, and dismiss the idea of builders taking their own as unworkable. This being so, the questions of—Who shall prepare them? Who shall pay for them? Who shall be responsible for their accuracy? And upon what system shall they be prepared? require to be settled, and it is in the settlement of these questions that the difficulties arise.

I will not occupy your valuable space at present with discussing the first three questions, though they are full of interest; but beg to draw attention to the question "Upon what system shall they be prepared?" believing this to be the one that should be settled first, and that if it were settled many of the difficulties surrounding the others would be solved.

When we consider the wide differences prevailing throughout the country in modes of measuring, allowances, technical terms, &c., all of which have taken root in their respective localities, it seems almost hopeless to attempt the task of reconciling them. It is needless to give instances of the different systems of measuring, for the absence of anything like uniformity cannot be denied. But it may be asked: Why should there be uniformity? I would answer that measuring is not a matter of taste; there should be only one right way—not half a dozen. The want of uniformity leads to confusion and litigation; it also places contractors tendering for work out of their own district at a disadvantage, while the advantages that would follow the adoption of a uniform system of measuring are that we should have better bills of quantities, contracting would be on a surer basis, and there would be less litigation.

The class most interested in this question are the contractors, for they are the principal sufferers; hence, they should take the initiative in whatever is to be done. I would suggest that the National Association of Master Buiders collect evidence of the various modes of measuring from the quantity-surveyors throughout the country; that they should print and distribute these to the architects and the building trades by means of their associations, and to the quantity surveyors who supply the information.

This being done, let them summon a conference of the three bodies to decide all matters in which there is a want of uniformity: let the result of this conference be embodied in the form of a handbook; if necessary, apply to the R. I. B. A. for its approval, and then put it into a publisher's hands, for sale throughout the country. Were some such scheme as this adopted and thoroughly carried out, there can be no doubt but that, in a short time, a more uniform system of measuring would begin to show itself. The book would be welcomed as an authority by all those who take out quantities, and by the building trades in general. Perhaps some other correspondent may suggest a better scheme, or improve upon this.—I am, &c.

QUANTITY SURVEYOR.

SIR,—Since your publication of my paper on this subject, a good deal of attention has been given to it by your correspondents and others, and a certain amount of, I was going to say, criticism, but I can scarcely call it criticism, because, so far as the real questions at issue are concerned, an almost universal approval has been expressed of the arguments I briefly and imperfectly used in advocating a builder's view of the subject discussed.

As the matter has now been fairly well ventilated in your columns since the appearance of my paper, you will, perhaps, allow me to offer a few concluding remarks in reply to your correspondents.

1st. In your own editorial article, dated 20th August, while you favourably notice my paper, you, through some misapprehension, do me a slight injustice by saying "It is not generally true, however, that each unsuccessful builder is called upon to spend in cash a surveyor's fee, in consideration of his having had one chance out of six to obtain the contract." I made no assertion of this nature, which will be seen at once on reference to my paper. Again, I have not said builders always refuse to compete unless quantities are delivered to them free of expense; neither have I objected to builders giving their own time free in preparing estimates. As to Mr. Reid's seven columns, I have a difficult task in replying to him—first, because he really agrees with me as to all the real points in my paper; secondly, because he is, as I suspected on reading his letters, neither an architect, surveyor, nor builder; therefore, in one sense, he is out of court. However, Mr. Reid and possibly others might misinterpret my meaning, if I treated his assertions on various matters with silence. Mr. Reid, while condemning bad quantities as severely as I do, partially excuses such in Lancashire and Cambridge, because he can point to equally bad work from the banks of the Thames—whereas I condemn the defective quantities wherever they come from, and I am well aware that bad and good work of the kind is sent out of both London and Lancashire; but I have only acted fairly in giving the preference to the well-known, regular London quantity surveyors, as a class, as being immensely superior to the same class in the provinces: this fact is patent to all men of experience in such matters.

After describing the slovenly and ignorant manner in which quantities are taken in architects' own offices, Mr. Reid adds, "He (the architect) knows how faithfully they are taken." Can anything be more inconsistent?

Mr. Reid next asserts, as a fact, that a year or two ago builders in Liverpool commonly "cooked" and "arranged their tenders" ruthlessly shunting aside honest competition, &c. I have had nearly forty years' experience, and I say I have not only never known of such an occurrence, but I say such a practice could not be common or even occasional without my knowledge, and I, therefore, denounce the statement as untrue. We are asked by Mr. Reid, 'How can an architect know whether quantities, taken off outside his office actually represent his plans and specifications, or whether or not they are taken in a manner to give unbounded delight to the builder?" He thus insinuates that high-class professional men, whose reputation and success in their profession depend upon their trustworthiness, are not so fit to be trusted to honestly perform their duties as are men acting in a subordinate capacity as architects' clerks. Mr. Reid must, indeed, be a novice, notwithstanding his denial, if he really believes such nonsense. Mr. Reid proceeds to pay architects a poor compliment when he says that every architect should strive after taking out his own quantities, "in self-defence," as well as in his client's interests, so as to assist him in maturing his plans and specifications.

Now, I imagine architects will not admit that their ability to prepare well-matured plans and specifications is to be gauged by the extent of their practice in extracting quantities, and, if time and space permitted, many reasons can be advanced in opposition to Mr. Reid's theory. As a builder, however, I have no objection to an architect, nor to a surveyor, or a joiner, taking out quantities, if the client who employs and pays for the work guarantees such work, and places the builder in his proper position, namely, as a tradesman supplying goods to the order of the client or his agent who supplies the order. In my paper I have advocated the method which I think is the wisest and best for all the parties concerned, as likely to work smoothly, and to obviate disputes and litigation; and, from long experience, I know that nearly all disputes in building contracts arise in consequence of inefficient and unqualified quantity surveyors being employed. Mr. Reid next asks if I "wish architects to consider themselves as builders' servants, and simply to register their doings." No, Mr. Reid; I don't wish anything of the kind; nor can anything in my paper be twisted by any reasonable mind as suggesting an insinuation of this nature. Mr. Reid insinuates that builders "attempt to dictate to proprietors and architects who shall be clerk of works on a building." On this point Mr. Reid seems to write feelingly, and he appears to have had experience with a queer set of builders. I, for one, have never heard of any builder attempting to dictate the appointment of a clerk of works, and I question if Mr. Reid can point to one such case. I have, indeed, heard of a few instances, and possibly Mr. Reid may have also, of builders objecting to work under men who had become notorious, whether rightly or wrongly; but I see nothing very unreasonable in a contractor refusing to commence an important contract when he discovers that the proprietor or his architect has appointed over him a man who is personally obnoxious to him, or who has a bad reputation, and Mr. Reid himself will doubtless admit that there may be some men who are unfit to be trusted to act righteously and honestly as a clerk of works. There are cases known where architects have been subordinate to the clerk of works, when that important individual has been independently appointed by the client without consulting the architect, who has been obliged "simply to register his (clerk of works) doings." I have known of one drunken, swearing, prize-fighting, wife-beating, dog-fancier, while acting as clerk of works, boast of having got three architects "sacked," and if the fourth opposed him he would suffer the same fate. Mr. Reid, I presume, will admit the right of a contractor to refuse to degrade himself a second time by service under such a man. Mr. Reid has made much of his difference with me as to the meaning of the word "abstracting." If I had used the word "extracting," he would have been saved half a column of your space trying to show that I intended to convey a meaning which both the word itself and the context should prove I did not mean. If he will consult a dictionary, he will find the word used perfectly correct, although he confuses it with the technical term "abstract," the meaning of which I need not explain to your readers. I have no objection to Mr. Reid acting as a quantity "*clerk*" to assist a surveyor in abstracting from his employer's dimension-book the skilled work he finds therein; but I do object to unskilled men "abstracting or extracting quantities from plans," and I do not speak disparagingly of joiners and others when I say, as a rule they are utterly unfit to perform the duties of a surveyor. It would be no reflection upon a surveyor or a doctor if I said they could not earn their wages or properly serve me as joiners or masons. I next come to the most ridiculous of all Mr. Reid's theories—viz., that it is quite as necessary for builders to conform to a test before being allowed to qualify as builders. Can anything be more absurd? The builder's test is patent to every one—that is, he must perform his work before he is paid for it. What other test does Mr. Reid want? He has to perform his work to the satisfaction not only of the satisfaction of the customer, but also of his customer's clerk of works and his architect, to each of whom he grants almost absolute power to reject or accept what they please and to grant him what price they please as the reward for his work. If he fails through his own fault, no one but himself suffers. Now, how is it with the unqualified clerks who act as surveyors? They act under the shelter of their employer's signature, have no responsibility themselves, and in the cases I object to, their employers have so little confidence in their work that they carefully warn all contractors that they will not be responsible for the accuracy of their assistant's work issued in their name. The contractor's eyes are closed. He has no means of knowing who has taken such quantities, or what is the reputation or qualification of the surveyor. Who suffers the loss caused by inefficient work so done? Either the builder or his customer, except in such cases (and I admit they are numerous) when architects are so honest and just that, notwithstanding the fact that the contract saddles the builder with everyone's mistakes as well as his own, in practice the architect does his best to set matters right in the end, by ignoring the terms of contract, and allows the builder to be paid what is fairly due to him. This discussion has not arisen to guard the builder against the faults of such men, but against those who occasionally insist upon the stipulated contract "pound of flesh," setting aside what is reasonable and just towards the builder, and letting off the culpable surveyor scot-free. Mr. Reid, in his last letter, repeats the statement that builders trust their foremen to measure extras, but he now modifies his statement by saying the foreman hands in a "list of extras"; this is a very different thing to "measuring extras," even though it was confined to one trade only; but I would ask what builder was ever so fortunate as to possess a foreman capable of acting as a surveyor to measure work of all trades and all descriptions throughout a building? Mr. Reid writes unfairly in accusing Mr. Machell of speaking contemptuously of foremen because he questions their capacity for performing duties that no reasonable employer would exact from them. I have as high an opinion of good foremen and workmen as Mr. Reid has, and his insinuations to the contrary are unfair, and outside the subject under discussion.

When Mr. Reid asserts that quantities are "practically" the basis of contracts, he well knows that this is partially true, and when the principle is carried out it is done in many cases by the architect ignoring the strict terms of the contract, and acting conscientiously as though no written contract existed. I admit this is done in the majority of cases, but not always, and at best it is only a make-shift method of doing the right thing in a roundabout, unbusiness-like way.

In conclusion, I have, at the call of my brother-builders, treated this important subject of quantities in no unfriendly spirit towards any person or class; my object has been to throw some light upon the subject, with a view to an improvement of the system which would alike benefit all persons interested, be they clients, architects, surveyors, or builders; believing that business done on the best principles will, in the end, be the most prosperous and safe to all concerned. Thanking you for your space, and for the interest you have taken in the subject,—I am, &c.,

EDWARD HUGHES.

Liverpool, Oct. 12.

THE EVILS OF TRAPPING IN CONNECTION WITH CLOSETS AND DRAINS.

SIR,—I have read the communication upon this subject from G. A. Foster, which appears on pp. 427-428.

A great part is taken up in praise of the so-called "trapless closets"; but the experience of other plumbers as well as my own condemns them as dangerous and expensive sanitary mistakes, owing in part to the filth that accumulates *out of sight* where the valve works, and this upon the house side of the valve.

Farther, the valve often does not shut, owing to paper sticking in it, and especially in such prolonged dry weather as we have had in many places of late, when the water will be turned off for the greater part of the twenty-four hours.

In this case the "trapless closet" becomes a great nuisance, owing to foul air from it blowing freely into the house from the soil-pipe, and, where Mr. Foster's plans are carried out, also from the drain and sewer, while the lifting of the handle often causes a "Bull's Run" on the part of the puller. With the lead siphon-trap this is not so readily the case; moreover, the lead siphon-trap with water in it retains the disease-germs, and does not allow them to pass through it, even when it may allow some sewage gas to pass through it. With the "trapless closet," again, disease-germs can blow freely into the house; consequently, such a disease as diphtheria would be much more liable to be caught where "trapless closets" are in use than where the much cheaper hopper form of closet, with nothing but the water in the siphon, is used.

The most scientific paper I have either heard of or read as yet upon the Trap and Water-Closet System is that by Dr. Neil Carmichael, Glasgow. Of water-traps he says:—"A simple trap excludes all injurious substances which the soil-pipe may contain." And as regards closets he says:—"A basin with its outlet so curved as to form a siphon-trap, the deepest part of which is seen from the basin, the whole formed of one piece of glazed earthenware, fulfils all the conditions of a simple, clean, safe, and cheap water-closet." In this sort of closet the whole of it is above the floor, and there are no working parts about it to get out of order as in the "trapless closets" with their machinery, and as the soil-pipe should be fitted with a disconnecting ventilating trap at its foot, where the simple closets I refer to are fitted in, no bad air from either the drain or sewer can get near them, which is quite the opposite of Mr. Foster's plans.

I fitted up these simple earthenware closets in one piece about twenty-four years ago, and they were recommended by me in this journal eight years ago. Mr. S. S. Hellyer, of London, author of one of the best treatises upon plumber-work as connected with the sanitary fittings, lately brought out an improved closet termed the "Vortex" in this style, while two by another party are at present in use and on trial *versus* the earth-closets at the Gas Exhibition, now being held at Glasgow under the auspices of the Philosophical Society there.

Mr. Foster seems quite oblivious to the fact that, supposing he had half a dozen locks on his "trapless closet" they would not be worth a farthing in keeping out both sewer and drain gases from the house if a hole or leaking joint existed one inch or more from his closet.

He is a false prophet who says that the soil-pipe should act as the ventilator for either the sewer or a large cesspool: doing so is equivalent to keeping a barrel of gunpowder in the cupboard.

It is perfectly laughable to read Mr. Foster writing about the extracting power of a ventilating pipe "when heated by the sun shining on it": it would be more to the purpose to get the *moon* to do the trick, as it would be more useful when people were in their beds. To get the benefit of "the sun," too, all soil-pipes would have to face the south.

As to the references to the New York Board of Health and Mr. Bailey Denton, the statement implied by the former, that drain-air plus sewer-gas is fouler than drain-air plus fresh air, will not stand examination; moreover, house-drains may be foul owing to leaky joints, which it is absurd to blame the disconnecting-trap for. There are also traps and traps. A good trap, with its water-surface, say, two inches or so lower than the drain coming into it, is *no impediment* to the flow-off of the water; and as regards the latter, his illustration of how a water-closet should be fitted with an air-pipe from off the house-side of the trap led back into the soil-pipe is simply a mistake.

As to Mr. Foster's flap-valve for the drain, and his "free use of disinfectants," the recommended use of, or necessity for, these proves the utter fallacy of his plans.

In conclusion, I beg to state that plumber-work and house-drainage, executed on Mr. Foster's plan, would be exceedingly dangerous for the inmates. Only a few days ago, I read in a public newspaper that the attempt to do without water-traps, tried at Guy's Hospital, London, had "ended in failure."—I am, &c.,

W. P. BUCHAN, Sanitary Engineer.

SIR,—In reference to doing away with traps—to cut off sewer-gas from houses and insert flaps in lieu thereof to drains outside, as well as plugs to w.c. apparatus, would, I fear, be attended with evil. The plugs in w.c. apparatus, I have seen in a London hotel and at a provincial station, sometimes show themselves liable to be choked by paper, or other foreign matter; and in case of there being no outlet ventilators to soil-pipes the sewer-gas, I surmise, would be subject to escape into apartments. This would be doubly serious where there is a suction strain upon closets on this principle, in houses not provided with sweeter inlets and many fires, requiring air for their effective working. The flap in drain-pipe would also be open to the objection of its not always tightly fitting, by reason of solid matter sticking between flap and rim of drain. In case of a plug-closet pan being used, would it not be better to have a prolonged or after-flush, so as to allow time for the plug to regain its bearing, leaving water over same after using? Additional water would help to flush and cleanse soil-pipe from accumulations to the sides. In case of plug getting out of order, would not air in passing over accumulations, as well as sewer-gas arising from same, prove unsavoury and injurious to health, in case of inefficiency of trap-seal? Perhaps long upright arm above apparatus and leading to roof would have sufficient pumping power, by having self-acting ventilator at the top, to draw air down through leakage of basin plug, and thus prevent nuisance. How would plug and trap combined act, so that if plug did not fit tight, water in trap would still seal?—I am, &c.,

TOLOP.

SIR,—I see that Mr. Foster advocates the abolition of a trap altogether for w.c.'s, and recommends a closet with a plug. Cordially agreeing with most of his remarks, I cannot see the advantage of the plug over the trap, supposing the trap to be merely the outlet of a hopper basin, the soil-pipe and the top of the siphon being fully ventilated.

The objection to this hitherto has been the form of the basin, which would hold only a small quantity of water at the bottom of a deep hopper. But with the improved form of basin, which holds as much water as an ordinary pan or valve-closet, and which has merely a trapped outlet, without the contents having to be washed out into a trap below, this is the simplest and best form. The quantity of water takes away all fear of its becoming untrapped or siphoned, and cuts off all draught and communication with the soil-pipe, which (with the best of ventilation) is never free from smell.

Any frost which would affect this would also freeze up a plug; and the plug can hardly be free from danger of leakage, obstruction, and wear. But apart from this, there is the liability of its being used at times with an insufficient quantity of water, to the danger of corroding the pipe and drain. Mr. Foster must excuse me if I cannot understand a plug to be simpler or less liable to derangement than a mere siphon outlet; which latter Mr. Rawlinson, at the Exeter Congress, strongly advocated. The force of the flush depends upon the manner in which this flush is let in.

Supposing the pipes may be sufficiently flushed and ventilated to be free from gas, all may be well with the plug; but the probability is in favour of any gas rising up through the water rather than being forced down by it, during the opening of the plug.

The trapping of a basin such as I have referred to is quite a different thing to a trap which is out of sight, and is not liable to the objection which was urged against them generally. —I am, &c.,

WILLIAM WHITE, F.S.A.

GLOUCESTER CATHEDRAL.

SIR,—I observe (B. N., p. 403) that you say: —"We notice that the published dimensions of the Cathedral follow the figures given in Murray and elsewhere, whereas, a few months since, the Royal Engineers engaged in the Ordnance Survey issued the results of remeasurements which slightly differ from these. Thus, the height of central tower is still stated at 229ft., whereas, from surface of ground to summit of pinnacles, the corps of engineers found it to be 225ft. 10in." In my "English Minsters," Vol. 1, page 159, I gave the height 225ft.; at Vol. 2, page 13, a plan gives the relative positions of all the English Minsters.—I am, &c.,

MACKENZIE E. C. WALCOTT.

THE LATE MAJOR WHYTE MELVILLE MEMORIALS.

SIR,—I shall be glad if you will allow me to correct two slight errors in the notice of these memorials in your last week's issue. The fountain at St. Andrew's, and the monumental cross at Tetbury, were both designed by me; but the handsome memorial tablet in the Guards' chapel at Wellington barracks was designed by Mr. George Edmund Street, R.A., and not by myself.

The stone of which the memorial fountain at St. Andrew's is constructed is from the Corncockle quarries on the Applegirth estates, belonging to Sir Alex. Jardine, Bart., and is much finer than that known as the ordinary red-sandstone of Dumfrieshire.—I am, &c.,

ROBERT W. EDIS, F.S.A.

14, Fitzroy-square, W., Oct. 12.

NEWBURY GRAMMAR-SCHOOL COMPETITION.

SIR,—See the enclosed post-card received in reply to an application for particulars as to the competition for the above schools. Architects have evidently to undergo still further fleecing in these competitions.

There was the semblance of fairness in the advertisement, that a professional man would be consulted in the award.

This however, is, to a considerable extent, nullified by the receipt of the post-card enclosed.

Either the committee or the secretary are determined to have something out of the probable competitors, in addition to the plans submitted, which must cost a considerable sum. Whereas the committee or the parties managing this competition cannot afford to spend *one shilling* upon each competitor, they expect the architect to spend from five-and-twenty to fifty pounds in sending them a design which stands a chance of getting £25, or the commission to do the work.

If you will kindly give this a place in your next issue, I have no doubt it will induce many others to adopt the same course as myself—viz., to refuse to make the generous body a present of not only designs, but a paltry shilling for the particulars of competition.

This is the latest dodge in competitions.—I am, &c.,

WILLIAM E. LEES.

180, Radford-road, New Basford, Notts, Oct. 13.

[COPY.]

NEWBURY GRAMMAR-SCHOOL COMPETITION.

The applications for particulars relating to the above are so numerous that they will only be forwarded on receipt of one shilling in postage stamps. H. Burke Godwin.

Newbury, 11th October.

Intercommunication.

QUESTIONS.

[6257.]—**Yellow Deals.**—Can any correspondent tell me where the 12ft. and 24ft. yellow deal planks come from? The ones I refer to are 9in. wide and 3in. thick. Also the average number cut out of a tree, and the average distance such trees stand apart in their native forests?—H. A.

[6258.] — **Valuations.** — Will some reader of the Building News kindly inform me of some work on Valuations?—Enquirer.

[6259.]—**R.I.B.A. Proficiency Examination.**—Would any fellow-student kindly answer the following queries respecting the above examination:—1stly. Can you go in for it without going in for the preliminary before? 2ndly. What is expected in mathematics and physics. 3rdly. In the form of application, what is meant by matters left to the option of candidate? 4thly. Are the subjects given in the class of distinction compulsory? 5thly. Is there no syllabus published? I have rules, examination papers, and form of application, and I think they are not quite explicit enough.—Subscriber.

[6260.] — **Surveyors' Examinations.** — Would any of your readers acquainted with the Metropolitan Board of Works examinations before the Royal Institute of British Architects oblige by giving particulars of examinations, and by suggesting how a person wishing to pass may best prepare himself? A list of books bearing on the course of examinations, or a note of the sources from which the necessary information may be gained would be very acceptable. Would also like to know if the passing of the above examination is of great advantage to surveyors outside of the neighbourhood of London, and if one well up in the duties of a borough surveyor should have any very particular disadvantages to contend with.—C. E.

[6261.]—**Foundations.**—A church was erected some 50 years ago. Tower (forming porch) and spire were intended, but then carried up only ground-story high, but with foundations sufficient for completed work. Ten years ago a railway tunnel was formed some 40ft. from porch, rail level, say, 30ft. from surface. It is now proposed to complete tower and spire. Will existing foundations be sufficient? If not, what should be the special characteristics of new ones?—A Junior.

[6262.]—**Hill-Side.**—A hill-side meadow land, clay, height, say, 150ft., slopes regularly about 1½ to 1, to pond at foot. Portion (about two-thirds up) has slipped away, leaving a gap some 6ft. deep. Owner wants the even surface permanently restored. How can it best be done?—A Junior.

[6263.]—**Door.**—May I ask a reply to the following question:—What is meant by a 1½in. ledged door? The drawings furnished to me are marked 1½in. ledged doors, and in the quantities are described the same. The doors hung are ¾in. matched boards, and ¾in. ledges or braces. Upon my telling the contractor he has made a mistake in putting these doors, I am told by him, greatly to my surprise, that this is according to the plans and quantities, and these are 1½in. ledged doors. May I, therefore, ask for information from your numerous readers their opinion on the subject?—A Puzzled One.

[6264.]—**Wall Ties.**—Can some reader give me the benefit of his experience in the above? Are the wrot. iron wall-ties advertised by Chambers, Monnery, and Co., 5-16th of an inch square, strong enough to tie a 4½in. wall 30ft. high to an inner 9in. wall, and how far apart should they be horizontally and in height? Are the cast-iron ones ever used, and if so, how far apart?—Novice.

[6265.]—**County-Courts.**—Can any reader of the Building News give me any information regarding the planning of county-courts, or refer to any published plans?—Sphinx.

REPLIES.

[6239.]—**Tile Roof Gauge.**—A 4in. gauge is sufficient for Broseley tiles on a roof having a pitch of 45°.—W. and P. J.

[6252.]—**Groined Ceilings.**—Nicholson's "Principles of Carpentry," Newland's "Carpenters' and Joiners' Assistant," published by Blackie and Son, will give all the needful information.—G.

[6253.]—**Half-timbered Building.**—The price per foot cube for a cottage such as P. Rolyns makes inquiry about, will much depend on the locality and labour. If gravel or ballast can be obtained, and the framed work is of an inexpensive character, 8d. a foot cube would be a fair price. Generally, the cost is about a third more than plain brickwork, though, if several houses were built, and the concrete could be made on the spot, the cost would be considerably reduced.—G. H. G.

[6254.]—**Roof Tiles.**—The size of Broseley tiles is 10½in. by 6¼in. Vertical tiling should have 3 nibs and 2 holes for nails, and not bedded in mortar. The gauge should be about 4in. Price per square, 12s.—W. and P. J.

[6255.]—**Warming Conservatory.**—The best and cheapest mode of warming the small conservatory named by "W. H." is by a gas-stove boiler and coil pipes, taking care that the air of combustion is conveyed from the building. The best boilers I am acquainted with are those of copper, manufactured by Messrs. Verity Bros., gas engineers, London, which are heated by their atmospheric fire-clay gas-burners. These stove boilers have connections for coil pipes, the best form of which are the hollow wing pipes (Byram's patent), manufactured by Messrs. Appleby, in Renshaw Iron Works, near Chesterfield. These two inventions combined form a most effective apparatus, one requiring little or no attention, and the size and power of the same can be made to suit all circumstances. The writer's attention was attracted to these inventions at the late exhibition of gas appliances at Bradford, and he has seen nothing so effective or generally applicable to warming purposes.—W. S.

[6255.]—**Warming Conservatory.**—It would be almost invidious to single out any one stove suitable for this purpose, as there are so many in the market all well adapted; but I should be inclined to adopt a terra-cotta stove, such as Roberts's patent, or Doulton's radiating tile stoves, as there is no unpleasant vapour or smell from these; and, for a small conservatory, the absence of these results, almost inseparable from iron stoves, is a consideration.—G. H. G.

[6256.]—**Internal Walls of Dwelling-Houses.**—In reply to query of "One in Doubt," 9in. interior walls are considered good walls for brick houses of large size. With regard to the position of the plate, what "One in Doubt" says is very true, but the middle position of plate is perhaps the best, as it enables the brickwork to be built up on each side, though only 2¼in., while if the plate is put entirely on one side of the wall, as commonly done, the decay of the timber would render the wall unstable. Two plates, of course, are worse than either. There is no doubt of the defect in the system; but the evil can only be remedied by adopting boxes to receive the ends of joists which form at the same time the plate or rest for the joists. The latter sentence of the query sounds ironical. Perhaps it is intentionally so. "One in Doubt" has served his time with a provincial architect "who always used good thick internal walls," and placed the joists according to the shape of rooms, but, alas, he finds our "eminent architects" adopting another plan, and he says naïvely "I would not expect them to use inferior construction." I am afraid the writer will learn by experience that it is better to expect nothing, for if he looks to some eminent architects for enlightenment in this matter, it will be the blind leading the blind.—G. H. G.

CHIPS.

A new gymnasium was opened at the premises of the Young Men's Christian Association, Bristol, on Wednesday week. It has been constructed at a cost of £400, from the plans and under the superintendence of Mr. Joseph Foster, who acted as honorary architect.

Extensive works of sewerage and drainage are in progress for the East Grinstead rural sanitary authority, from the plans of Messrs. Smith and Austin, engineers, and under the supervision of the board's surveyor, Mr. J. Turner. At the last meeting of the authority it was decided to apply to the Local Government Board for a further loan of £2,000, making £13,000 up to the present time.

Loughborough Park Congregational Chapel, Brixton, was reopened on Sunday after alteration and improvement. A plain tower, 15ft. square at base, and 80ft. in height, has been built on the street frontage, in white Suffolk brickwork, with Bath dressings; this is finished with slated spire, and contains a staircase to new gallery, which is seated for 150 people and to which the chapel-organ has been removed. The alterations have been carried out by Messrs Hooper, from the designs of Mr. Manning, architect, at a cost of £600.

The local board of Stapleton, near Bristol, have adopted the plans for the drainage of Stapleton, prepared by Mr. Curtis, their surveyor, subject to modifications suggested in the report upon them by Mr. Frederick Ashmead, of Bristol; the estimated cost of carrying out the works is £18,000.

The governors of Portsmouth Grammar-school opened on Tuesday week tenders for the erection of a new wing at the school to accommodate 160 scholars. Eight tenders were received, ranging within remarkably narrow limits, from £8 0s. 6d. to £8 10s. per head, and the lowest, that of Mr. Lewis, was accepted.

A new pumping-engine for the drainage of the Southtown marshes, near Yarmouth, was publicly started on Monday week. The engine and boiler were made at the Yareside Ironworks, Yarmouth, for the Earl of Lichfield, who owns the marshes.

Memorial stones of a new Primitive Methodist chapel, at Swanick, near Alfreton, were laid on Tuesday week. It replaces an older building on the same site, will be Gothic in style, the facing materials being brick and stone; 300 sittings will be provided, and the cost will be about £1,000. Messrs. Brown and Simpkin, of Eastwood, are the contractors.

The Chesterfield rural sanitary authority have obtained the sanction of the Local Government Board for the borrowing of £2,900 for carrying out works of water-supply in the villages of Unstone, Killamarsh, Eckington, Dronfield, Coal Aston, and Holmfield.

A quantity of Roman remains have just been disinterred in a private garden at Glyde-path hill, Dorchester, the latest and most interesting being portions of a tessellated pavement, the patterns being of red and white bands. The coins that have been found are chiefly of the period of Allectus and Antoninus Pius.

The town council of Burnley have decided to extend the waterworks for that town at an estimated expenditure of £80,000.

Our Office Table.

In a most sensible letter to the *Times*, Mr. William White, F.S.A., says:— "The reform most urgently required at the present moment is the extension of the Act which is designed to allow tenants and sanitary authorities, even in the absence of agreement, to compel landlords to amend defects in the drainage of rented houses. The Act is almost inoperative on account of the difficulties, or supposed difficulties, of exercising the coercive power without expensive litigation; but apart from this it contains no adequate provisions for the correction of defective soil-pipes and water service. I have recently endeavoured in vain to induce the landlord of a house, in which I am interested, to provide a water service for domestic purposes apart from the only one which is supplied from a cistern over the water-closet; this closet being served by the customary spindle valve, with the water-box, which inevitably releases the bad air from beneath into the water at the bottom of the cistern. I have appealed to him further to remove and to ventilate the decayed and constantly leaking lead soil-pipe (occasionally eaten through by rats from the drain) which runs down inside the house, adjoining one of the sitting-rooms, leaving it in an almost chronic state of stench. And more than this, I have appealed to the sanitary inspector, but could get no redress in these matters."

The Rev. Brooke Lambert, in a letter to the *Times*, referring to a report that Whitechapel Church is to be rebuilt on the old model, as a former vicar in one of the district churches, and as one who has done duty in the above church, feels that public opinion ought to be brought to bear on those in whose hands the matter rests. When the church was burnt down, he, in common with many, while regretting the irreparable loss of old memorials, felt at least some satisfaction in the thought that one of the most costly blunders of modern times could be repaired. The church, so Mr. Lambert declares, was, for all purposes of elocution, simply abominable; and he remarks further that it is useless to rebuild churches if the people who attend them cannot hear, and no parish prejudice, no private influence or professional feeling should be allowed to perpetuate a blunder affecting in the results the edification and the usefulness of the people and the parsons of the future. The rector of the church, in another letter to the *Times*, says that:—"In point of fact, nothing whatever has been decided with reference to the rebuilding of the church. No one is at all likely to have a voice in the rebuilding of the church who is not anxious that its acoustical properties should have the first consideration; and it is conceded on all sides that this will involve some departure from the 'old model.'" The rector adds, "That the problem which awaits solution is not quite so simple as it looks. To cover a large area with a building which shall be perfect for speaking and hearing is by no means easy, and there is no authority to which we can turn for absolute guidance in this matter." He invites a discussion as to what was the cause of the comparative failure in the church just destroyed. "Was it the height of the nave, 78ft. from the floor to the ridge? Was it the barrel-shaped roof? Was it the apsidal chancel, or was it the west gallery? Or was it all of these, and, if so, in what proportions?"

In proof of the possibility of churches being built entirely of concrete, without even timber for the roof, the *Antiquary* mentions that there is, or was till lately, such a building, which was originally intended for religious purposes. It is a very small chapel, situated on the Denbighshire coast, near the Colwyn station on the Chester and Holyhead Railway. Close to it is a weir on the sands, and the chapel was built for the parish priest to say mass in daily for the success of the fishery. Its dimensions are of the smallest—perhaps about 10ft. by 6ft.—the roof and walls are alike of concrete. It is quite dismantled, and has not been used from time immemorial. The vicar of Llandrillo-yn-Rhos receives a rent-charge, in lieu of the tithes of the fish, for officiating.

At a meeting of the Common Council last week, another effort was made to avert the all but consummated scandal of the new Temple Bar obstruction. The city architect stated that the nuisance will cost "only six thousand guineas," with a trifle for extras of some £4,000 more. Of the three extras, two would be statues of the Queen and Prince of Wales, at a cost of £1,200 a-piece. These are to be of marble—they might as well be of sugar-candy, as far as their appearance goes, after a 12 months' exposure to London soot and dust. The third is a griffin, on the top, at a thousand guineas. Ultimately the question was adjourned to another meeting. There seems to be little hope of common sense prevailing at present, but it must do so ultimately. Everybody will recollect how the Corporation tried hard to spoil London Bridge, and how very nearly they succeeded. Just such another check now must be administered to the City Fathers if we are to be saved from the latest consequences of their folly.

The Liverpool Engineering Society held its usual fortnightly meeting on Wednesday evening, the 6th inst., at the Royal Institution, Colquett-street, Mr. A. Ross, president, in the chair. A paper on the "Construction and Maintenance of Highways," by Mr. Windon, the reading of which had been adjourned from the last meeting of the Society, was read and discussed. The President, announced that the next meeting of the Society would be held on the 27th October, when a paper by Mr. H. A. Dibbin, M. Inst. C.E., "On the Combination of the Block and Interlocking Systems on Railways," would be read.

Dr. Alfred Carpenter proposes to do away with fog in London by the adoption of the following means:—1. A tax upon coal-consuming grates; 2. Gas retailed at a price not exceeding 2s. to 2s. 3d. per 1,000ft.; and 3. The enforcement of the law against chimneys not consuming their own smoke; while London railway companies should be compelled to use similar precautions with their engines. "Soot," says the doctor, "would not then be a part of our daily food. We should not have to burn gas when the mid-day sun is shining without a cloud above our chimney-tops; our public buildings would not be disfigured by black mantles, or rapidly destroyed by the sulphurous atmosphere which renders their destruction now inevitable."

A conference, under the auspices of the Sunday Society, for the purpose of considering the desirability of extending the Society's organisation in Scotland, particularly as regards Edinburgh, was held on Monday afternoon in the Royal Hotel, Edinburgh, the Rev. John Glasse, Old Grey Friars, presiding. There was a pretty large attendance, and the proceedings on the whole, passed off much better than in the Art Department of the Social Science Congress, in which the subject of the Society's programme was introduced the same day.

The summer that has just passed is said to have been remarkable for a considerable increase in the death-rate of New York, specially attributable to an unusual mortality among the inhabitants of tenement houses. The limited space on the island on which residences could be built has induced the erection of buildings capable of holding a large number of families, and the packing of these together in a manner that has shut them out from the chance of light and ventilation. In many places similar houses are built in the rears of the front ones, on the same building lot of 25ft. by 100ft., thus effectually shutting out light and air from all. The result of this crowding of the tenement-house districts has given New York in some blocks a population of 750 souls to the acre. While there are in London's most densely-populated neighbourhoods 175,000 people to the square mile, there are in parts of the Fourth Ward of New York 290,000, or over 60 per cent. more. As a natural consequence of this overcrowding, cleanliness has become impossible. The regulations of the Building and Health Departments are disregarded, laws and ordinances are violated, and badly-drained houses, without the required means of disposing of ashes and garbage, with scarcely the conveniences demanded by common decency, have been supplemented by filthy neglected streets. The people who live in these places have nowhere else to go. They are compelled to pay in such dens rents that would secure them a decent house in any other city, because there are no cheap suburban residences in New York, no cheap apartment houses in healthy localities where working people may live.

CHIPS.

The tapestries from St. Mary's Hall, Coventry, are being repaired for the town council of the city at Messrs. Bartlett's, Blenheim-street, London. The canvases are being cleansed from the accumulated dust of centuries, bringing out the colours and outlines more brightly and distinctly, and the ragged edges made good. The work will be another six weeks in hand, and it is said will make the tapestry capable of lasting a couple more centuries.

The Brighton Board of Guardians on Tuesday week instructed Mr. Maynard, surveyor to the Board, to prepare plans for the extension of the workhouse, by the erection of buildings on the south side for 120 female adult imbeciles and 30 children, and on the north side accommodation for 100 male vagrants.

A new peal of eight bells were dedicated at Crawley parish-church, Sussex, on Wednesday week. They were cast by Messrs. Gillett, Bland, and Co., of Croydon, and are hung on oak framing, and furnished with chiming apparatus. The total cost has been £600, and the work has been carried out under the superintendence of Mr. H. Boswell, in the employ of Messrs. Gillett and Bland.

St. John's Church, Stratford-by-Bow, was reopened on the 2nd inst., after internal renovation, including the colouring of walls and arcades, and the filling of the margins of windows with stained glass. The work has been carried out by Messrs. T. Norton and Sons, of Stratford. The tower and spire are still undergoing repairs, the contractor for this being Mr. J. Morter.

New schools at Cwmffrwdoer have just been erected for the School Board for Trevethin, near Pontypool, and will be opened about a fortnight hence. Messrs. Morgan and Evans were the contractors.

A new organ in Berwick-on-Tweed parish-church, built at a cost of £570, by Messrs. Harrison and Harrison, of Leeds, was opened on Thursday week.

Mr. Mirrless has been re-elected Lord Dean of Guild for Glasgow, for 1880-1.

The Cardiff School Board on Thursday week adopted plans and designs by Mr. P. Price, of that town, for the proposed new schools in Stacey-road, and those of Messrs. Habershon and Fawckner for the new schools in Splotlands.

The town-council of Stockton-on-Tees last week appointed a committee to consider the desirability of providing a public park for the townspeople.

The parish-church of Great Oakley, near Manningtree, Essex, has been reopened after restoration: the uneven dilapidated walls have been made sound and seemly, the galleries have been removed, and the pews are replaced by open benches.

The final act in the transfer of the undertaking of the Strood Waterworks from a company to the Corporation of Rochester, took place on Wednesday week, when the deeds of transfer were signed. The sum paid by the city for the undertaking is £7,945 15s. 4d. It is the intention of the town council to extend the works so as to afford an ample water-supply for the whole of Strood and Frindsbury.

Prince Leopold has accepted the invitation of Mr. W. Busbridge to deliver to the students of the Metropolitan Drawing Classes the Queen's prizes awarded by the Science and Art Department. The Lord Mayor will preside, and the ceremony will probably take place in the Guildhall about the first week in November.

The Council of the Royal Historical Society having resolved to institute regular courses of lectures "On the Science of General History," and elected Dr. G. G. Zerffi, F.R.S.L., F.R.Hist.S., to deliver the first course of 30 lectures during the sessions of 1880 and 1881. Arrangements have been made for the delivery of the lectures in the lecture-theatre of the South Kensington Museum on Saturday afternoons at 3 o'clock, commencing with Saturday next.

The memorial-stone of a new Wesleyan chapel at Alan-road, Ipswich, was laid last week. The cost will be £1,077. Mr. Hubert is the architect, and Mr. A. Coe, the builder.

A new Congregational chapel at Nacton was opened on Wednesday week. The cost will be about £400. Mr. Coe, of Ipswich, is the builder, and Mr. A. Couder, of London, the architect.

Mr. Charles Walsh has been appointed surveyor to the rural sanitary authority of Halstead, Essex.

The town council of Newcastle-on-Tyne received, on Wednesday week, a report from Mr. Alfred M. Fowler, M.I.C.E., borough engineer, as to the proposed new thoroughfare from the Milk Market to Pilgrim-street, the net cost of which he estimates at £84,000. The scheme has already been sanctioned in principle by the town council, and the matter stands over for consideration in detail. Should it be carried out, an estimated sum of £15,000 will be saved from the £84,000, as an Artisans' Dwellings Act scheme will be obviated by the cutting through of an "unhealthy area" in Pandon.

The plans of Mr. J. C. Walker, surveyor, Hornby, have been adopted by the rural sanitary authority of Lunesdale, for the sewering of the village of Halton.

The Wigton urban sanitary authority opened, on the 7th inst., 15 applications for the office of sanitary inspector, the salaries required varying from £36 to £150 a year. The authority appointed the man who asked least money—a local joiner named T. Tiffen.

An inquiry was held at Godalming, on Tuesday week, before Major Hector Tulloch, R.E., an inspector of the Local Government Board, relative to a complaint from certain memorialists at the Charterhouse school and the neighbouring village of Farncombe, that the Godalming rural sanitary authority had made default in providing sufficient sewers for the district. The complaint appeared to arise out of a dispute between the masters of Charterhouse and the sanitary authority as to who was responsible for the cost and plans of the sewering of the Charterhouse estate.

The Chiswick commissioners have accepted the tender of Messrs. Mowlem and Co., Grosvenor Wharf, Westminster, for the kerbing and channelling of the main road with Aberdeen granite, a distance of 1½ miles, through Turnham-green.

The Chelmsford highway board received on Friday a report from a committee as to the advisability of adopting the contract system for the repair of highways. Forty-eight replies had been obtained to circulars. As a result, the committee recommended the board to appoint one surveyor for the whole district at a salary of £250 per annum, that his exclusive services be given to the board, and that, on his appointment, it be explained to him that the board proposed to let out the repairs of the highways. The report was adopted, and it was decided to retain Mr. Whitmore as surveyor till the end of the financial year in March next.

The Keswick local board received and accepted, last week, notice of resignation from Mr. Till, their surveyor.

For the proposed hotel opposite the new railway station at Preston, the directors of the London and North Western and the Lancashire and Yorkshire Railway Companies have accepted the tender of Messrs. Neild and Co., Manchester.

Works of water supply are in course of completion for the villages of Arlecton and Frizington, for the Whitehaven rural sanitary authority. Mr. Gardine, of St. Helen's, is the contractor, and the work is being executed from the plans and under the supervision of Mr. Renney, surveyor to the authority.

A plan for a new post office at Hereford has been prepared by Mr. Rivers, the Government surveyor. The new building will be of stone, with ornamental dressings on the front. The cost will be between £4,000 and £5,000.

On Sunday morning fire broke out in the Guildhall at Arbroath. The property was completely destroyed. The damage done will amount to several thousand pounds.

Considerable additions have been made to the Bible Christian Chapel in Barn-street, Liskeard, from the designs and under the skilful direction of Mr. W. A. E. Skeutleberry, architect, of East Looe. The edifice is of Early English Gothic character, local stone being used for the walling, and Bath stone for the various dressings. The carved work is by Mr. Harry Hems, of Exeter. Mr. Nicholls, of Liskeard, is the general contractor.

The new hostel for the residence of the students and tutors of the Scholæ Cancellarii, Lincoln, was opened by the Bishop on Friday. The building was, till recently, the county hospital, and was bought for £4,000; the alterations have been effected at a cost of £3,000, from the designs of Messrs. Goddard and Son, of Lincoln. Rooms for 32 students and two tutors are provided in the old wards, and the former board room and dispensary are converted into a private chapel. The contract has been carried out by Messrs. Martin and Sims, of Lincoln.

The local board of Oxford received a report at their last meeting from the drainage committee stating that £184,000 had already been borrowed and expended in the drainage of the city, and that a balance of £6,722 9s. 7d. would be required to complete the undertaking. It was decided to apply to the Local Government Board for permission to borrow a further sum of £7,000.

CHIPS.

Our ablo contemporary *Engineering*, has just added a new featuro to its pages, viz., an illustrated record of patents, which will be of very great service to inventors, patentees, and the public generally.

At Rotherham, on Friday last, the principal, Mr. E. Norris, of Westbourne, opened a spacious new schoolroom. It is warmed and ventilated by one of Shorland's patent open fireplace ventilating warm-air stoves.

A Roman Catholic church at Courtwood, about five miles from Portarlington, was dedicated on Sunday. The church is Gothic in character, and has, with the adjoining presbytery, cost over £9,000, exclusive of the high altar which is constructed of granite and marble, and cost the donors £600. The architect was Mr. William Hague, of Dawson-street, Dublin, and the builder, Mr. Harris, of Monasterevan.

A new reredos has just been placed in the old parish-church of St. Nicholas, Brighton. It is a carved oak frame, containing three paintings, representing "The Adoration by the Magi," "The Annunciation," and "The Baptism of Our Lord." The artist was Mr. Corbett, of London, and the cost, including framework, wainscot, and painting, was £230.

Extensive works of water supply are approaching completion at Dunfermline for the town council. Messrs. J. and A. Leslie, of Edinburgh, are the engineers.

The Guisborough highway board resolved last week to build a new bridge at Commondale, from the plans of Mr. Paver, their surveyor, and at an estimated cost of £340.

At the thirteenth annual meeting of the Powysland Club, held at the museum and library in Welshpool, on Monday, the question of association with the Cambrian Archæological Association was discussed, it being mentioned that the nearest approach to a central museum for Welsh antiquities was to be found in the Powysland Museum, in which they were assembled, and which has just been enlarged. It was resolved to open negotiations with the council of the Cambrian Archæological Association, with the object of making the Welshpool Museum a general and central one, in antiquarian matters, for the Principality.

◆

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway s well-known and highly-esteemed Pills put the power of removing his infirmity within the grasp of every invalid. Martyrs to indigestion, who are daily becoming weaker and worse, may make themselves stout and strong by taking these medicines in the doses plainly indicated in their accompanying directions.

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Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your Glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

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CINDER-SIFTING ASH CLOSETS.
Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

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Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
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Norton-sub-Hamdon, Ilminster, Somerset.
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McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
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BOX GROUND STONE
Is the Best for Use in all Exposed Positions, being Well-known and Tried Weather Stone.
50,000 Feet Cube in Stock.
PICTOR & SONS,
BOX, WILTS.
[Advt.]

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Aberdare.—For making a culvert over the Dare Felhan in North-street, for the Aberdare local board :—

Thomas, T., Aberdare (accepted) ...	£172	2	0

[Lowest of three tenders received.]

Allenheads.—For the erection of parsonage house and boundary walls at Allenheads, Northumberland, for the Rev. J. M. Lister. Mr. Edward Shewbrooks, architect, 2, Market-street, Newcastle-on-Tyne. Accepted tenders :—

Excavator, bricklayer, mason, slater, and plasterer :—

Charlton, *., Northumberland ...	£917	10	0

Carpenter and joiner, plumber, painter, and glazier :—

Fairlamb, T., Northumberland ...	£667	0	0

Boundary walls :—

Charlton, J.	160	0	0

Barmouth.—For extension of promenade, and works connected therewith. Mr. Thomas Roberts, engineer, Portmadoc :—

Evans and Jones, Dolgelley ...	£1,895	19	9
Owen, Portmadoc	1,843	0	0
Jones, Barmouth	1,656	0	0
Davies, Portmadoc	1,552	0	0
Williams, R., Harlech	1,534	0	0
Davies, Waenfawr	1,500	0	0
Hughes, Portmadoc...	1,475	0	0
Pritchard, Portmadoc	1,349	0	0
Jeffreys, Colwyn Bay	1,138	2	8
Williams, G., Harlech (accepted)	1,113	1	6

Battersea.—For alterations at "Magpie," Battersea Park-road. Mr. H. I. Newton, architect, 27, Great George-street, Westminster :—

Blenkarne	£205	0	0
Beale	196	0	0
Walkley	178	0	0
Lamble	157	0	0
Taylor, Brixton-road (accepted) ...	143	0	0

Bedford.—For new business premises, Harpur-street, Bedford, for Mr. Chas. Bryant, poulterer and dealer in game. Mr. John Day, architect :—

Spencer, T., Bedford	£590	0	0
Hull, J., Bedford	575	0	0
Corhy, J. and Son, Bedford... ...	566	0	0
Foster, S., Kempiton...	560	0	0
Warton, J., Bedford	545	10	0

Bedford.—For new coach-house and stable with hay-loft over, &c., at Wadsworth House, Kimbolton-road, Bedford, for Mr. Thos. Bull. Mr. John Day, architect and surveyor :—

Haynes, G., Bedford	£119	10	0

Brighton.—For erecting a wall on the western and southern boundary of the workhouse extension site, for the Brighton board of guardians :—

Barnes, J.	£360	0	0
Patching and Son	298	0	0
Cheeseman and Co.	290	0	0
Lockyer, G. B., Brighton (accepted)	285	0	0

Bristol.—For the reconstruction of St. George's sewers, for the St. George's local board :—

Yalland, T. K. (accepted)	£757	10	0

Chalfont St. Giles's.—For additions to mansion and new stabling at the Grove, Chalfont St. Giles's, for G. H. Salisbury, Esq. Mr. W. T. Sams, architect. Quantities by Messrs. J. and A. E. Bull :—

Knignt and Sons, Chertsey (accepted) ...	£4,210		

For stable fittings :—

Musgrave, Bond-street, W. (accepted)	£627	1	6

Chiswick, S.W.—For dust removing, cleansing and slopping, for the Chiswick Improvement Commissioners. Mr. H. C. Smith, engineer :—

For Turnham Green and Brentford-roads :—

Winn, J....	£250	0	0
Burford & Ball, Chiswick (accepted)	160	0	0

For all the other roads in the parish :—

Winn, J.—	£214	0	0
Hancock, J.	210	0	0
Stroud, J., Acton	190	0	0
Burford and Ball (accepted) ...	160	0	0

Clapham.—For construction of roads and sewers upon the Broomwood Park Estate, Clapham Common. Messrs. Hammack and Lambert, surveyors :—

Harriss	£9,960	0	0
Neale, R. and C.	9,500	0	0
Cardus...	8,990	0	0
Rigby	8,932	0	0
Neale, J.	8,600	0	0
Pound	8,292	0	0
Bloomfield	7,882	0	0

Dawlish.—For the extension of the town water supply, for the Dawlish local board :—

Shapter and Son, Dawlish... ...	£1,578	0	0
Tripe, W. P., Dawlish	1,532	0	0
Portbury and Co., Exeter	1,012	0	0
Johns, E., Dawlish	918	0	0
Soper and Salter, Exmouth ...	899	0	0
Hawkins and Best, Dawlish ...	818	0	0
Taylor, Bros., Teignmouth ...	720	0	0

Epsom.—For extending a wood-cutting shed at the workhouse, for the Epsom board of guardians :—

Walker, F., Leatherhead	£69	0	0
Warr, Croydon	66	0	0
Rivers, H.	55	0	0
Jeal, J.	53	0	0
Stone, F.	49	7	6
Hards, G., Ewell	49	5	0
Stredwick, Epsom (accepted) ...	48	10	0

Euston-road, N.W.—For alterations and repairs, for Mr. F. H. Warr. Mr. Edwin T. Hall, architect, 57, Moorgate-street, E.C :—

Riddell, G. and T., Newington Butts (accepted) £600.

Feock, Cornwall.—For the rebuilding and renovating of Feock Wesleyan Chapel. Mr. Silvanus Trevail, architect, Truro :—

Julian, J. H. and Sons (accepted)...	£250	0	0

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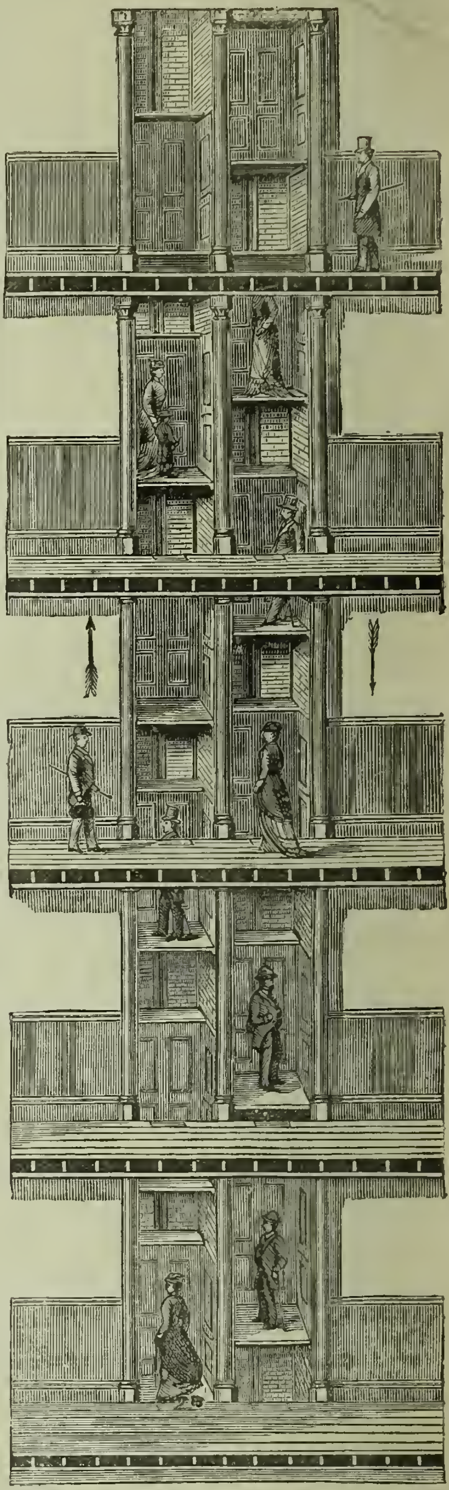

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THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 22, 1880.

THE PRICE OF ARCHITECTURE.

II.—In Money.

IT is worth considering, that almost every civilised nation has found it possible, often for centuries together, to treat all its buildings architecturally. Every race has at all times had, as our own race has at the present time, to deal with works of all classes, temporary and permanent, costly and cheap: and has found no insuperable difficulty in making each and all, in their proper ways, artistic. In this sense, architecture is not a matter of money. All the world has had, at one time or another, a cheap architecture—not the less refined because of this—for cheap building, and a temporary architecture—not the less genuine because of this—for temporary purposes. True, it has also had a costly architecture where costliness was fitting, and a permanent architecture where permanence was wanted; but its buildings were all harmonious, and there were no discords in the ascending scale from the lowest to the highest. The barns and cottages of the Middle Ages, for instance, were not more vulgar or commonplace than its cathedrals. The wooden châlets of Switzerland are, many of them, works of art, as well as the churches of Lausanne and Freyburg. The most temporary, and cheapest, perhaps, of all architecture—that of Japan—is genuine in its way, as well as the permanent and costly works of Egypt and Rome. It is a great misfortune for us—though one which was inevitable, from the nature of the case—that the cheap and temporary buildings of our own Mediæval period have, with few exceptions, passed away. We know well what the higher class of works were, for they are still to be seen; but we can only infer from a few lingering remains, and a number of post-Mediæval imitations, what the commoner ones resembled. In addition, moreover, to this inevitable lack of knowledge, the workers in the Gothic revival, or some of them, suffered from a constant misdirection which was not at all inevitable. Art-critics, with their boundless eloquence and self-confidence, assured them that, as the Gothic style sprang out of the constructional necessities of vaulting, no buildings but vaulted ones were truly Gothic. A sort of half-toleration might, indeed, be given to the mass of English churches, which, if they had no vaults, had plenty of pointed arches, buttresses, and other features of the true Gothic style; but as for the domestic work of the same periods, with its wooden floors and square-headed windows, it was not worth the slightest study or the smallest imitation. Of late years we have heard the same argument over again, used, this time, to prove that Gothic work is quite unfit for modern purposes. The style arose from vaulting, we are told, and can only be carried out perfectly with vaulting. Now, it is out of the question to vault our town buildings generally, to say nothing of houses and cottages; therefore Gothic architecture is unfit for town buildings, houses, and cottages. The first inventor of this argument, whoever he was, had clearly studied Gothic in nothing but its cathedrals. In the best Mediæval times, according to him, everybody ought to have lived in a cathedral, bought and sold in a cathedral, put their corn into a cathedral, and kept their cows and pigs in a cathedral. If Mediæval builders erected, for any one of these purposes, a building that was not vaulted and buttressed, they were traitors to their principles, and false to the very style they invented. This is what the argument leads us to: and it makes us ask whether its inventor is prepared to apply the same measure to other styles, such, for instance, as the Greek? The essence of the Greek temple style lies in its shadow-casting colonnades and porticoes; but does anyone suppose that every Athenian felt bound, on true art principles, to make his house into a miniature Parthenon? We know, on the contrary, that Athenian dwelling-houses, in the golden age of Greek art, were exceedingly slight and unpretending: and yet every fragment of Greek pottery and jewellery teaches us that all the art of that age, civil and domestic, as well as religious, must have been perfect in taste and keeping.

The truth seems to be, that every style, and the Gothic style amongst the rest, had one mode of treatment for grand monumental works; and another mode, quite different, and yet quite harmonious, for everyday purposes. If anybody likes to say that the everyday style of the Middle Ages was not Gothic, so be it. At any rate, it was the style which the Gothic designers evolved as most fit to harmonise with their monumental works; it was the architectural prose which they felt ought to go along with their architectural poetry. The great weakness of the modern Gothic revival has been its neglect to study the prose, and its attempt to put everything into poetry; till now, in revulsion from it, we see another and smaller revival which would put everything into prose. The strength of this latter revival, absurdly called that of the "Queen Anne style," is, that instead of aping in taverns and dwellinghouses the features which fitly belong only to permanent national works, it accepts the conditions of humbler life, and tries to make something artistic out of them. In spite of all the gratuitous follies and puerilities of its detail, it is, in the best examples, more truly in harmony with good Mediæval buildings than nine-tenths of the civil and domestic edifices of the Gothic revival. It is nearer, in fact, to the "prose style"—the style for cheap and temporary buildings—of the Middle Ages, than are all those combinations of shapeless general form with pretentious ornament, which have been palmed upon the world as adaptations of the Pointed style to secular requirements. However imperfect, and even positively objectionable, it may be, it is, in this respect, an effort in the right direction; an attempt to provide, as every age of living architecture has provided, a graceful way of doing common things, to supplement its noble way of doing great things. It will not be a final attempt, for nothing is final; it will be followed by, or, far better, will transform itself into, more genuine and more satisfying attempts at the "prose style" which we have so long been wanting—simpler, truer, and more natural; but the lesson once learnt will not be lost, and we may count in the future on having once more a cheap and temporary manner of building for cheap and temporary structures, as well as a costly and permanent manner for dignified and durable monuments.

Coming round, then, to the immediate subject of this paper—the price of architecture in money—it would seem that its price must depend very much on what it aims at. A vast quantity of modern building aims at being, not only more than, for pecuniary reasons, it can be, but more than it ought to be, even were money no object at all. This is true of a multitude of the designs which get chosen in competitions, especially where there is no professional adviser, or where his advice is not taken. And even where there is no competition, as in London street-buildings generally, this is the sort of design which publicity-hunting clients are apt to seek for, and too often to obtain. The price is high enough—higher than that of real architecture—and incomparably too high for work whose every attempt at art only makes it more vulgar and repulsive. Half the banks and offices in London might have been built with real taste and beauty for twenty per cent. less than it cost to make them flashy and obtrusive: and half the houses in the suburbs might have been made homelike, refined, and attractive, at a considerable saving on the amount it took to render them dreary, commonplace, and wearisome. The fact is, modern architecture, like modern society, is nearly all standing on tiptoe. The cottage wants to pass for a house, and the house for a mansion, and the mansion for a palace. Instead of trying to be the summit and flower of its own class, everything prefers to be the sediment and refuse of the class above it. Where such an aim as this exists, no money can ever be enough. If ten thousand pounds are provided, the constant effort is to do something which could only be properly done for twenty thousand; and if the twenty thousand were forthcoming, ambition would rise proportionately, and stretch upwards to something that would really need thirty or forty thousand. In our times money is too often lavished where it would be better withheld, and grudged where it is urgently wanted. Private and relatively temporary buildings are covered with misplaced ornament stolen from monumental structures; while our monumental structures themselves are dwarfed and stunted for want of the funds which work of the highest class demands. In short, we need more money for most of our public buildings, and less money for many of our private ones; and we need, at the same time, to put every sort of building into its right and natural class, and to keep it there. The price of architecture, as regards the mere cost of its construction, was not too high for ancient Greece, or 13th-century Britain to pay; and they were both poor indeed, compared to modern England. Its price, in this sense, ought to be the price which it takes to carry out a building thoroughly well in the manner best fitted to it; to build a great public edifice in marble and granite, with sculpture and painting as good as living artists can make them; to put up a London street-dwelling in brick and terra-cotta, with ornaments fit but few; to run up a country cottage in tiles and concrete, or, it may be, in wood and plaster; but to do each, in its way, as perfectly as the rest. It is, in short, the price which it costs to realise in art the maxim once followed in life—

> "Honour and shame from no condition rise;
> Act well your part—there all the honour lies."

Thus far, we have considered the "price of architecture" as meaning the money which it takes to erect truly architectural buildings; the sum laid out in materials and labour to shape them from the ideal into the actual. But what about the cost of the ideal—a thing as much more valuable than mere bricks and stones as mind is more precious than inorganic matter? Is not this idea the very essence of the subject—the thing which, if it is absent, will turn all the hoped-for architecture into mere finery, and make it better for the builders that they had been satisfied with four walls and a roof? Is not this worth paying for, and what should be the price of it? The price of it at present is 5 per cent. on the value of the work. The work may require much thought or little, and the thought may be of the highest quality or the lowest: but it is all valued alike. Giotto and Raffaele, if they were alive, would receive their 5 per cent., and so also would Batty Langley and Peter Nicholson. It would cost 5 per cent. to design Westminster Abbey, and 5 per cent. to design the theatre in the New-cut. For 5 per cent. you can get a plan for the mass of sheds and chimneys constituting some rough factory, which requires no details at all; or you can get the drawings for a tower like those of Laon or Rheims, which require an infinity of details from bottom to top. For 5 per cent. you can get the advice of the last-fledged pupil who has put a brass plate on his door and has begun to gain experience at his client's cost: of the last speculating builder whose speculations have failed, and who, rising in his fall, has dubbed himself "architect": of the pushing individual who calls himself auctioneer, surveyor, architect, and estate agent all in one—or of the accomplished artist, perfected by years of experience and a lifetime of study. In modern architecture, as in death, all men are equal. The painter, as his work improves, or as his abilities are recognised, raises his price: the barrister expects higher and higher fees as his name becomes known: the author, if he is a rising man, is remunerated by the larger and larger circulation of each successive work; but the only reward, with rare exceptions, that comes to the most successful architect, is to get at last twice or ten times as much work as he can personally manage, all paid for at the same rate which he received at the outset of his career. By renouncing all care for his art, by doing his work just well enough to keep it coming in, and by making himself, in short, a mere "man with a muck-rake," a specially fortunate architect may at last get some compensation for the expense of his training and the unremunerated labour of his earlier years. But what of architecture all this time? Is that likely to flourish while the only way in which its practitioners can make a decent living is by first putting up two or three good buildings to show that they *can* design, and then by having to hurry over all the rest on pain of finding their way into the Bankruptcy Court? And again, what can be expected of it while the highest class of work is incomparably the worst paid, and while each architect, as a rule, only gets work of some one particular class? Five-per cent., no doubt, is plenty for arranging and superintending such things as factories, storehouses, and sheds; but it hardly pays for paper and office rent in the case of small schools and village churches. If architects generally were employed on buildings sometimes of one class and sometimes of another, things would equalise themselves, and on the average might be bearable; but as it is, nearly all the work of one sort goes to one set of men and nearly all that of the other sort to another set. In quality, the difference in the work of the worst of one set and the best of the other is something like that between the work of a Transpontine scene-painter and that of Leighton and Millais; and the effect is very much what it would be if these two classes of painters were paid all their lives long at one uniform price per square yard. The scene painter, no doubt, would live in clover, but the P.R.A. and R.A. would have hard work to live at all.

We noted in the previous article how, apart from all questions of making his professional duties pay, the modern architect is compelled to do his work in a small fraction of the time which it ought to take. His clients, as we saw, were nearly always in a hurry, and not unnaturally so, for time is money, in modern life. But we now see a still further cause which reduces the pitiful remnant of time which is left him—the necessity of carrying on his work at a profit instead of a loss. This, indeed, scarcely affects the architect whose work is of the lowest and roughest class. On the one hand, he needs far less time to study it in, and on the other hand, it pays so much better, that he can afford to give far more time to it. The more purely architectural anyone's practice is, the more he is hurried over it and the worse he is paid. If the present system had been devised for the purpose of suppressing architecture altogether, it could not have been more ingeniously adapted to its end. First of all, the public will not now pay the price of architecture in time; and next, they do the very opposite of paying the price of it in money, since the least architectural work is paid for the best, and the highest class of work can scarcely be said to be paid for at all.

MERCANTILE ARCHITECTURE IN THE CITY.

THE demolition of old property in the neighbourhood of Farringdon-street has afforded a favourable opportunity for the erection of warehouses on a more extensive scale than was previously found possible within the City. The "Queen Anne" promises to insinuate itself here and there. Though there is nothing very striking or original in that direction, yet a block of three houses and shops in red brick, pretending to follow that style, is in course of construction, from the designs of Messrs. Taylor and Locke, architects, of Basinghall-street. The red brick front is plain and sensible; the upper stories are relieved by brick pilasters corbelled out, and these support some moulded red brick cornices between the windows. A triple pilaster occurs between the houses, and a Mansard roof, with dormers, crowns the building. It is rather a pity such a narrow strip of building-ground as that on the west side near the Viaduct should have been built upon; but Mr. F. Beeston, of Lincoln's Inn-fields, has done his best to utilise the space. The building is a narrow slice of considerable elevation, having its narrow front to Farringdon-street, and facing Holborn Viaduct. It is a block of warehouses built in red brick, with stone pilasters, and entablature to the ground-story. The only attempts at ornamentation are the vertical panels in the front, and the circular gable; the panels have carved red brick foliage spiritedly done; the stone-work is plain, and the horizontal bands of stone lintels, &c., are continued round and form some relief. A total floor-space of 15,500 feet is obtained; the buildings are, we understand, fitted with every convenience for warehouse purposes. A very valuable site near is to be let for premises, the plans for which have been prepared to suit the requirements of tenants, by Mr. Vickery.

Between Snow-hill and Charterhouse-street, on the east side, a large area of ground has been filled up by a row of houses and shops, for the new Vegetable Market, in a more pretending style of architecture, which we might fairly designate as French Italian of a rather less ambitious kind than that of the Meat Market. The houses have shops towards Farringdon and Charterhouse-streets, and in the centre of the former frontage they are carried up four stories, the lower wings being roofed with high Mansard roofs, having stone dormers, of oval shape, carved. Faced with red brick, the relief is entirely confined to the narrow pilasters of stone which divide the houses, above which runs a stone entablature or cornice, and stone architraves around the windows. The entrance to the market will be by a corner archway of stone facing Charterhouse-street. When finished, these buildings will form part of the Corporation scheme; though why the Meat Market should have been so grand, and the buildings set apart to Pomona so plain, is a mystery. We cannot pass by the structure of red brick and stone occupied by Messrs. Dresser and Holmes, the art-furniture manufacturers. Its design has evidently been inspired by Messrs. Collinson and Lock's front in the same thoroughfare. It is gabled, and has a wide pointed-arch recess, partly filled by a stone mullion window, but left open below for a vestibule and balcony. In the brickwork are introduced panels of tiles of Oriental design, but we prefer the plainer and broader treatment of its original.

It is unnecessary to say that architecture of this class is not indebted for improvement to the efforts, sympathy, or taste of the architect who affects high art. As mercantile building it is suffered to remain in the hands of those whose first rule is practical common-sense. The absolute demands of site, light and air, and adjoining rights, the requirements of business have to be considered, and if these are duly met, the architect has earned and can fairly claim as much praise from the public as if he had to carry out the most costly structure of pure fancy untrammelled by utilitarian wants. The structural requirements resolve themselves into a few definite forms. The piers of brickwork must be massive and well-connected together, the windows must be wide and serviceable, and the architecture must be entirely governed by the position of the floors and the openings. Ironwork necessarily enters largely into the construction not only of the floors but of the windows, and if the architect can impart a little taste to the constructive details, which means a little more study and time expended upon them, he will not have laboured in vain. Among the plainer buildings in Farringdon-street, must be mentioned a warehouse now building at the corner of Clerkenwell-road, by Messrs. Colls & Sons. There is one effective warehouse style dictated by the requirements we have mentioned. We may call it the "Continuous-pier style." In this form of building the openings naturally arrange themselves in the vertical spaces between the piers, and the windows can be separated by horizontal lintels or interfenestral woodwork or panels recessed from the outer face of the building. An example of this is seen in Messrs. Brett's premises in Holborn; but there are many other instances to be met with in the city. The horizontal divisions are made subordinated to the vertical, and the architect has an excellent material ready to his hand in terra-cotta which can be cast in panels. Flemish Gothic adapts itself well in the way of ornamentation, especially in the fenestration, but the trabeate styles of construction equally suit the warehouse, and might be made, in competent hands, very characteristic. In Aldersgate-street, opposite Manchester Hotel, the vertical or pilaster style may be noticed in some new buildings, the peculiarity of which is the small amount of walling introduced.

A considerable addition to the office accommodation in Chancery-lane has been made by Mr. Clark, architect, of 20, Southampton-buildings, by the erection of a large block of chambers facing Lincoln's-Inn. The front is of Portland stone, of five stories, with strongly marked horizontal divisions, between which the windows are made the prominent features. These in fact are not subordinated to any order, but give the key-note to the elevation in a manner rather obtrusive than architectural. Every story has its own species of window; the ground-floor has circular arches rusticated, with large keystones and carved heads, the first floor has square-headed windows; above this the changes are rung with segment and square heads. The variety, if not charming, is vigorous. Each row is united as it were by the horizontal cornice over it; but the effect is spotty and the details lumpy, and breadth is lost by the multiplicity of carved pilaster caps, consoles, and keystones. In the centre the façade is broken by a slightly canted bay over the entrance, the windows being returned without modification. The red granite shafts to the ground-floor windows are meagre, and the capitals heavy, and the carver of the keystone heads to the arches has endeavoured to impress the beholder by the size of his work—one of the unfortunate results attending architectural sculpture. We enter the building by a central doorway between polished red granite jambs, a series of shafts of this material forming the pilasters of the windows to the ground-story. A straight corridor leads from front to back, opening from which are the offices. In front, on each side of corridor, is a large room of considerable length, and behind this are two smaller rooms or offices, well lighted, which are planned so as to admit of being let together or singly. Thus on each side of the main corridor we get a suite of three chambers well adapted for legal or other professional or mercantile purposes. Light to the centre rooms in the rear is obtained by an area on each side, which thus reduces in width the size of room, while the rearmost offices are lighted at one end and the side. Ascending by a stone staircase from the corridor, we alight on the first floor; the level of the chambers in the rear is reached from the first landing, a few additional steps leading to the rooms in the front. The back rooms are of moderate size, and disposed in a like manner to those below, and can be let as suites or singly, while there are four front rooms, two on each side, well-lighted by wide three-light windows of plate-glass. There appear to be seven stories of chambers behind, and six floors of large rooms in front, or about fifty rooms in all available for offices. Each floor has the same central corridor approach, and the architect has ingeniously contrived the doorways of the offices in the rear, which on plan form splayed notches in the rooms, an arrangement allowing the doors, by being set at an angle, to front the corridor approach. Greater space in the corridor is thus afforded, and a kind of small lobby made to each entrance. To afford ample light to this part glazed lights are introduced along the office partitions close to the ceiling. Each office has a fireplace, so that partitions between them would render each complete. The walls and ceilings are finished with plaster, but no decoration has been attempted. Sanitary arrangements have been caried out in a complete manner in the basement. Below the pavement in front of the building, a wide area lighted by pavement lights traverses the whole frontage, and a series of water-closets are obtained vaulted underneath the footway. The corridor or area forms a well-lighted space in front, and is paved with white and black tiles laid in a diagonal pattern; the walls are lined with white glazed bricks. Chancery-lane is gradually throwing off its old smoke-begrimed aspect, and façades of formal design have arisen in the place of dingy brick premises; offices ill-ventilated and badly lighted, choked with the dust and cobwebs of ages, have disappeared; but as yet modern architecture has only made a change with little improvement, so far as the art displayed in the new building is concerned.

ST. PANCRAS INDUSTRIAL EXHIBITION.

THE second St. Pancras Industrial Exhibition, opened last Saturday at the Institute in Drummond-street, is a decided improvement on the last annual display. Two classes of exhibitors send their handiwork—professional and amateur; and a third class of articles, the work of apprentices and others under 18 years of age, belong to both ranks. Taking the lower and smaller room, we are agreeably struck by the large number of articles in metal and cabinet work, wood-carving, and decorative furnishing. Wrought iron has not a few workers, who have done their best to show that we have not altogether lost the art of the Mediæval workman. An ornamental stand for flowers, made of wrought iron, with hammered foliage, by E. A. Mills, of Liverpool-road, Islington, is one of the most noticeable of the articles in this class. While we can accord praise for the technical skill and power of design manifested in it, we may regret that so much skill has been spent on a design faulty in the principles of ornamentation. The back and side panels, with their branches and leaves bent in natural positions, are too imitational; they might be the stems and tendrils of the plants they imitate so well; but they are, nevertheless, out of place for the purpose they serve. Altogether, there is wanting a *motif* in the design. The model of ornamental gates, by J. T. Aldis, of Fitzroy-square, and the iron shield, by B. Humphreys, a smith, of Burton-crescent, are creditable productions.

Repoussé work finds some able representatives of the art in A. W. Austin, A. de Caesmaeker, and W. J. Allard. The panel in silver repoussé, by A. W. Austin, Stoke Newington, is spirited in execution. Henry Irving, as Macbeth, by A. de Caesmaeker, is also clever in manipulation. Embossed and chased metal, copper, and brass-work are to be seen. The pair of finger-plates, No. 12, are vigorous in design; but we cannot admire the heavy mounted casket, in an architectural style, by T. H. Wyatt, brass-finisher.

Several very creditable specimens of cabinet-work show that the artists in this class of work have taken up the later and better types of design. We may refer to the suite of bedroom furniture, No. 61, exhibited by W. M. Holdom, of Old Ford-road, manufactured in walnut, relief being given by simple incised lines. The wardrobe and toilet-table are effective and simple in outline. S. Kendall's model of "Early" English (query Late English) cabinet is also pleasingly simple. Another quietly-conceived cabinet, called an "ebonised Early English cabinet," by J. Flattely, also took our fancy for its simplicity and breadth of treatment, it is relieved by brass furniture, of good design, and a coved shelf at the top. The cabinet in walnut, with painted satinwood border round the glass, shown by J. Beauchamp, of Gray's Inn-road, and the toilet-table, No. 57, by W. H. Davies, with light wood drawer-fronts, are both well-made and effective. The study of good old cabinet-work is evidently leading to a plainer and more sensible mode of ornamentation, depending on truthful outline and the natural relief of the material, without extraneous aids. The inlaid cabinets, by W. Gray, of St. John's Wood, and W. Langsdale, carpenter, are clever in workmanship; but the effort in No. 72 to produce something elaborate has resulted in flashiness of a vulgar kind. The best inlaid work are the two panels by W. Claytou, Wardour-street (Nos. 65, 66); the first, the Decalogue, is a work of which we spoke in commendation in our notice of the Alexandra Palace Exhibition. Several specimens of marble and glass mosaic have been sent by J. Curtis, mosaicist, of Kentish Town. We may mention Nos. 67, and 68, also some inlaid panels by A. Tourbillon, of Newmau-street, Oxford-street. In the specimens of wood-carving, many admirable attempts are to be seen. The large panels of wood-carving by Grinling Gibbons, restored by G. H. Bull, Stauhope-street, and two very elegantly carved panels in lime-tree wood, one an adaptation of the oak, and the other of the crocus, by the same artist, are noteworthy designs. W. Aumonier, Tottenham Court-road, contributes a carved oak panel in low relief, Italian in spirit; and W. F. Jenkins, Euston-square, several clever panels for cabinets. The sycamore carved Cupid on blue ground is pleasing in colour; but we cannot admire the over-mantel in ebony and sycamore (No. 31) overladen with crude ornament, and sadly wanting in breadth and meaning. The book-covers, carved in oak, by Maria L. Irwin, Lower Norwood (28), and Maria E. Reeks, Chelsea, are praiseworthy as the work of lady artists; so are the treatment of birds in oak, No. 32, and the book-covers, No. 43. Generally there is less of that meaningless natural imitation, even in this branch of artistic handwork, than we are accustomed to see.

Fancy fret-work is a production which always greets us at these industrial collections. It is, perhaps, unnecessary to remark that there is not much to commend in this particular kind of art, further than the ingenuity and perseverance in the worker. Cutting out of thin wood, figures and other shapes, animal and vegetable, is a harmless way of occupying one's spare time, but as an artistic handicraft it seems almost profitless, if not puerile. At any rate, we have a large space devoted to vases, brackets, frames, and other specimens. Fret-work illustrating the Seven Ages of Man, by J. Sparrow, Hampstead-road, is clever, and the outlines good. Eugene Golonya also sends some neatly-cut objects. In turnery, F. Froud's vases in ebony and tulip-wood, J. Watzak's smoking-table (51), and the work of J. W. Watkius, call for notice.

Painting on glass and china is not a well-represented class. V. H. Haile, Kennington-road, sends a panel of six tiles, and two plates painted in subdued colours, of good design. The series of tiles representing Cinderella, by C. J. Parks (No. 80) is rather bright in colouring. The tiles exhibited by E. Sears, Lisson-grove, Nos. 84, 93, are clever, and represent the well-known fables of Æsop; we also notice some plaques with figure subjects. J. W. Chapman, Euston-square, shows a stained-glass panel of some promise, and Nathaniel Sears, an apprentice, Lisson-grove, a glass panel, with Æsop's fables, rather spoilt by the blue corners. A few oil-paintings are hung on the walls, but these scarcely call for any remark. In the water-colours we notice a view of church at Chingford, by T. E. Jeffers (107), and Hendon-road, Hampstead, by the same artist.

Passing to mechanical models, we have a large collection of horizontal and vertical engines: the names of R. Nasmyth, Bermondsey, and G. F. Lacey, Rotherhithe, are again conspicuous as exhibitors. A model safety-lift, by J. M. and K. W. M. King, Victoria-park, we have noticed somewhere before. The object is a good one, as the cage is arrested directly any breakage takes place. We must also mention a fern case, No. 145; a portable self-supplying lavatory (139), by T. Barralet, Finsbury; a nickel-plated bicycle; some air and water-tight boxes of tin, by G. Niepold, Hampstead-road; patent steam-screw ventilator (149), by J. B. Papier; new lock for carriage-doors (151), by S. A. Say, Old Kent-road. S. Smith, Dalston, sends a large collection of imitation woods and marbles, and T. Holtou, Lambeth, a four-panel door, decorated with chemical stains, clever as an application, but overcrowded in design. We must not forget in this class the invalid chairs and other ingenious appliances which are shown by Thomas McIlroy, of Fitzroy-square.

The larger room, occupied by amateur work, is bewildering in extent and variety of objects, from fancy woolwork to models of yachts. Beginning with the cabinet-work, we notice a lady's inlaid cabinet, by T. Clarke, a carpet planner. The designer, who is a better artificer than artist, seems to have been imbued with the appropriateness of a portico and steeple for this, and we should never have taken his work to be a cabinet. The decoration is even in worse taste; it is crowded with inlays and appliqué work, which gives it a very spotty, gimcrack appearance. Inlaid workboxes are numerous, but we can only mention a chest of drawers by a French polisher (200), and three panels by a furniture liner (203); specimens of wood-carving abound. One of the most striking exhibits is a chest of drawers (436), by O. R. Plummer, an apprentice under 18. The foliage is bold, but the work suffers from heaviness, and the carved upright sides are outré. The panels in oak (207), and the fretwork specimens (214, 215) show that genius in art is not confined to professional workers; but we must pass on to the oil-paintings. In this class of work we find a few creditable productions. No. 221, "Still Life," No. 224, No. 228, are clever studies, though by artists in another field. G. C. Blatchley, policeman, Hampstead, whose works we have before noticed, still finds time to dabble with his brush, and shows a decided talent, only needing cultivation. "Currants" (235), by a house-painter, are clever in the reflected lights and half-tints. No. 253 is also a clever study of Peonies, by a wood-carver. The water-colour drawings are less successful than we have seen them. Gertrude Duffield's "Study of a Helmet" (284), and the flowers in a cup (300), by a wood-carver, are two of the best works in this class. Pen and ink, pencil, and crayon drawings abound, but few are worthy of mention; they are only instructive as indicating the value of our art schools. Every conceivable occupation is represented, from silver-chasers to brush-makers and hair-cutters. Needlework abounds; we notice some good colours in 357, a work by a pensioner, N. Brixton. Some cleverly-executed crewel work and quilts may also be mentioned. Class III. is interesting as being the work of youths under 18. We mention at random (441) some fret-carved brackets by Dodimead; No. 514, stained glass; 519, four painted plaques cleverly conventionalised, and No. 520, with foliage and birds, chiefly the work of apprentices. The names of Langsford, Stacey, and Ryan stand well. Models of machinery are numerous, as Nos. 524, 525; and in ornamental work 538, 542 are noticeable productions, displaying technical skill and artistic discernment.

ON ST. ALBAN'S CATHEDRAL WEST FRONT.*

[WITH LITHOGRAPHIC ILLUSTRATIONS.]

WHEN I received a kind invitation to come to Lincoln for this Congress of the Archæological Institute, followed by the inquiry whether I could bring with me a paper, it struck me that a subject in which I personally was much interested, and had spent some time in the study of, and which also had risen to much national importance, might find favour on such an occasion; and I therefore made ready a paper on St. Alban's West Front, which for some time had occupied my thoughts, and which I shall now read, merely prefacing the remarks which it will contain with the proviso that, what I shall say comprises such information—and it is by no means small, as present known facts and discoveries will warrant—on which I have built certain theories, which may hereafter be somewhat modified by discoveries expected to be made in the future; of my broad outlines, however, I have little doubt, and such modifications as may hereafter be looked for will be, therefore, chiefly matters of detail. In dealing with St. Alban's I have dealt with it as its present remnants suggest, and as its recorded architectural history warrants; but for the general elucidation of its design it must be compared with parallel examples, and for the explanation of its extraordinary splendour, we must consider the probable motives of those who were its designers.

In former days at Cambridge it was my privilege to listen to some most interesting lectures by one whose name and memory will ever be cherished in the Archæological Institute, Professor Willis, upon Church Architecture, and I remember being particularly struck with his description of the oldest ecclesiastical building on record, namely, the Temple at Jerusalem.* We are all familiar with a general outline of the plan of that remarkable structure, and the Professor was able to lay down its measurements with extraordinary accuracy, reminding his hearers of some important information hitherto much overlooked in the later chapters of the Prophet Ezekiel; but the portion of that lecture which arrested my attention the most was a skilful effort to obtain some clue to the elevation of the building, of which no particulars have been preserved. The great central block of the structure was represented in a model as being much like a large oblong basilica, with the Holy of Holies at one extremity and a couple of towers enclosing an enriched entrance between them at the other; the towers in character being much like the examples still left us among the antiquarian treasures of Egypt; of course the space between this was conjecturally filled up; but, if I remember rightly, my late friend and instructor went so far as to regard it as forming Solomon's porch or the Beautiful Gate of the Temple. The ground-plan measures gave the bases of the towers, and the Professor explained that one of these must have been the πτερύγιον translated in our English Bible "pinnacle," but really small tower upon which our Lord was set at His temptation. We arrive thus at an idea something like the rough one before you of the loftiest and most imposing portions in the elevation of a building of which every feature was directed by Divine inspiration. The chief use which the Professor made of the conjectural restoration of a building which, if more of its particulars were known, would be of surpassing interest to the student of architecture, was to show that in all human probability our Mediæval forefathers knew just as much, or just as little, about this great building as we do; but that they had certainly grasped the idea of its lofty front, had realised the existence of its side towers, had localised its "beautiful gate," and from this, the greatest of architectural authorities, because its Architect was divine, had copied the design of a great and magnificent front to their churches, with portals of entrance which might well vie with a portal whose name was emphatically "beautiful." Whether this was so or not it is hardly necessary to prove by argumentative reasoning; the idea is a happy one, and it may well be credited to the praise of those who, with a less direct, but still with an almost spiritual instruction, designed many of the fronts of our great churches in the Middle Ages. It has often been said that days of mere hard business could never have produced the exquisite designs left to us now to marvel at; that they grew out of an age of contemplation, of seclusion, and of prayer; that they were the result of communings with the Divine Architect of all things; and so have a spiritual character about them which a more worldly spirit has failed to catch; it may be so; I do not suppose that any man nowadays would be able to design a Cologne, a Strasburg, a Rheims, or, coming nearer home, a Wells, a Peterborough, or even a St. Alban's, as they were then designed: happy is it that so many of them remain for us to admire and to love; happy that so many traces of a master hand remain, in some now ready to perish, that revived affection and an enkindled zeal may follow them out with tender solicitude, in the almost certain hope of reproducing with exactness the missing parts and the ruined portions, so that our children may see once again in their perfection the glorious works which have come down to us from our fathers.

I shall now endeavour to trace the history of one of the noblest of the church fronts which was designed in England, a front now in a state of degradation, but retaining providentially still traces of nearly every feature required to suggest and determine its restoration and reproduction. I will ask those who are so kind as to listen to me to go as far back in our present researches into antiquity as the Norman Conquest. There came over at that time an ecclesiastical architect since well known at St. Alban's, one Paul from Caen, who rivalling his superior, Lanfranc, at Canterbury, set to work to build a church which he meant to be the grandest in England. He built with the Roman bricks of Verulam, which he found hard by, and such was his assiduity, good fortune, and, I suppose, the liberality of his subscription-list, that he actually finished the whole church, and had the joy of beholding it completed in his life-time, a joy permitted to very few builders beside, on so magnificent a scale. Of this great church large portions (as you well know) still remain, in the great central tower, the transepts, the choir, a considerable portion of the nave, and the foundations of the western towers. From these foundations, described on page 87 of Buckler's valuable "History," and seen again during some recent excavations on both sides, it is evident that the Abbot Paul's front was of a breadth unusual at the time of its erection, and only to be seen in rare examples of later date in England. To obtain this breadth (which Buckler measures at 155ft., just 10ft. less than Peterborough), the towers do not stand at the western ends of the nave aisles, as at Canterbury, York, and Lincoln, for instance, but are placed on the north and south sides of the westernmost bay of the aisles, as seen in the arrangement of the Early English west front of the exquisite Cathedral of Wells at the present moment. I shall explain this arrangement best by the plan and elevation which I have placed before you. Of the ground plan there is no doubt; of the central tower which suggests the details of the smaller western towers there is no doubt, for, though lately ready to fall, it has now been skilfully and happily preserved for our admiration; of the pitch of the western gable and slope of the aisle roofs there is no doubt; all these have left marks to insure their own identity; three doors leading into the nave and its aisles there must also have been, but as to the filling up of details, though I believe what I have sketched to be substantially correct, any person is perfectly at liberty to arrange them otherwise, if he considers it worth while. I have followed Mr. Buckler in the probable completion of the Norman parapets, and conical treatment of the angle-turrets, as well as in some details of the transept-gables, which may suggest the arcading of the west front.

This front, when completed, must have been one of the grandest of its time in England; Canterbury was then finished with a splendid front, the north tower of which was spared by the Perpendicular architects of the more recent façade, and only fell a victim to the unwise zeal for uniformity displayed by a comparatively recent Dean and Chapter. Alas! for the loss of that noble and invaluable tower; where was the Society for the Preservation of Ancient Monuments then? But at Southwell we have three Norman towers still left, but more highly enriched than were those at St. Alban's, for their builders had the best of stone easy of access; but their size is inferior to the St. Alban's tower, and the Southwell western towers stand within the aisles, thus giving only the breadth of the three aisles of the nave to the front. The noble cathedral of Lincoln, too, had Norman west towers, much of which still remain, but they are situated like those at Southwell; so that at St. Alban's we have probably the first design in England which gives the magnificent breadth afterwards obtained at Wells and Peterborough, and by another, though different, subsequent arrangement at Lincoln.

The noble Norman front of St. Alban's only stood for about 100 years. Matthew Paris, as quoted by Buckler, mourns over its loss, and rallies its destroyer in a tone which shows that, in an age which moved rapidly in architectural development, there were yet some who liked old things better than new; probably St. Alban's never again looked so noble or complete as it did during the century when the grand front of its Norman builder remained; they were determined, however, to be content with nothing short of the grandest of work at St. Alban's; as decorative art advanced, these men must see it in its perfection; a laudable ambition infected its very atmosphere. John de Cella then, at this period succeeded one Abbot Warren, who had a new front, evidently, in view before he died, for he left a legacy of 100 marks to his successor to begin it, but John de Cella had a run of ill luck; his work seemed never to prosper, though anything more exquisite than his design had never entered human heart or brain before; and after interruptions and disappointments the work was left to a more practical though less elaborate constructor, William de Trumpington, by whom the Early-English front was made to inclose the west end of the church, though whether the upper stages of the western towers were then put on we have no means of knowing. Early-English foundations laid on the Norman remains, retained the plan as seen in the earlier front, and arches, one of which still remains perfect, on the south side, led out of the aisle into their lower stories; my own idea is that one tower certainly must have been carried high enough to contain bells, but we have no traces of these towers now higher than the line of the uppermost arcade but one of the front. But the great feature in the design of this new front was the addition of three magnificent porches, designed for working in Purbeck marble, the remains of which are among the most elaborate work which has come down to us from the middle ages. No other church in England can boast of portals such as these, Ely has one well known porch of extraordinary beauty, Peterborough three arches of stupendous magnificence, but St. Alban's alone possesses the three great portals which are the glory of the chief great Continental cathedrals, and are seen with such admiration now at Rheims, Amiens, and other well known beautiful fronts abroad.

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* A paper read before the Royal Archæological Institute, at the meeting at Lincoln, July, 1880, by the Rev. Owen W. Davys, Canon of St. Alban's, and Rector of Wheathampstead.

* The sketch, which was exhibited, and which space does not permit us to reproduce here, showed a front of Egyptian character, flanked by towers, between which was a portal of entrance.

St. Alban's west front, then, as designed by John de Cella, and carried out more economically by William de Trumpington, was arranged much as I have here represented it. The E. E. towers might well be of much the same character as the matchless central tower of Lincoln, for I have heard somewhere that builders from St. Alban's were employed in the construction of that tower, and its rich and elegant details correspond in many particulars with the remains we have discovered at St. Alban's. But at this point necessity drives us from the field of proof into the land of conjecture. We have, however, enough left to restore with accuracy up to the belfry stage of the Early English towers.

But another alteration befell this noble front. Abbot John of Wheathampstead, who lived in the days when the Perpendicular style prevailed, set to work to enrich the interior of his great church by means of painting, and stained glass, and at considerable loss to the external effect of the building, lowered the aisle roofs, filling the Norman triforium with tracery and rich glass, and inserting large windows at its transept ends, and in the central division of the west front. It would be necessary in a strictly conservative restoration to retain this western Perpendicular window, and fortunately this might be done without interfering with the Early English porches and arcading behind them.

I must now refer you more directly to the illustrations which I have prepared in reference to the past and future history of the west front of St. Alban's. I have already pointed out to you the Norman west front, and from this I must pass to the changes which its removal involved. At this time, the nave was roofed with oversailing oak shingles, the usual form and covering of roofs of the Norman period. The line of that roof is distinctly marked now on the great tower, and no change appears to have been involved in its form by the change of design at the west front. The gable, then, of the Early English west front must have taken the same form as its Norman predecessor, unless some greater enrichment than that of a plain gable, stepping, and pinnacles, for instance, as at Wells, concealed the line of roof behind it. I should imagine, however, that as the upper part of this west front was completed under pecuniary difficulties, the plain form was used, and that it was enriched with lancet windows and the usual ornamentation of the Early English period; perhaps, as suggested by Buckler, much after the manner of the coeval west front of Llandaff. In front, however, of this central gable came a highly-enriched wall, against which the eastern ends of the roofs of the three great porches were received; this would appear to have been carried out with a straight parapet on each side of the great Early English buttresses which still remain, until received by the tower buttress, which also remains, and in the opposite angle of which are the shafts of the continuation of the same arcade as it ran over the face of the south tower, also one arch of the lower arcade as lately discovered. The curious square abutments on each side of the present central compartment are thus seen to be a portion of the original front, and on the south the gable line of the great porch is still visible. We have thus, on the walls themselves, and in the magnificent fragments found in removing the stopping of the various porches, sufficient to obtain a very accurate clue to the true restoration of this noble front up to the straight parapet which I have alluded to, and completing the remaining portions, as we have every reason to conclude they were completed, or intended to be completed, we get upon paper, which is harmless compared with stone, a west front, much like the one before you, on which you may retain the present west window if you please.

Now we have clear evidence, and we may regard its discovery as one of those valuable facts which have come out of the interesting architectural controversy which the restoration of the high pitched roof of the nave has elicited, that in Decorated times the Abbots of St. Alban's, like the Abbots of Peterborough, became dissatisfied with their over-sailing roofs of shingles, and determined to have parapets, with the more noble covering of lead. At Peterborough the fall of the Norman central tower led to the reconstruction of the abutting roof against its Late Decorated successor; at St. Alban's possibly a less, but still a very great, failure of the ancient work, in the fall of the southern compartments of the nave so nobly rebuilt by Abbot Mentmore, suggested the same change; the result was a roof as seen at Peterborough, all but the lead, and now, I rejoice to say, seen again at St. Alban's, lead and all. We need the lead all the more at St. Alban's, as our parapets are long, unbroken, and plain, while at Peterborough the parapets are highly enriched, and the forest of glorious spires and pinnacles at the west end make many people come away forgetting that the covering of the roof is inferior to the original. This change of roofing did not, however, necessitate a change in the gable of the west front any more than it did at Peterborough, where the new roof falls at a less acute angle against the original gable, and no disturbance seems to have thus occurred to the form of the west front till the insertion of the west window. If one man from Wheathampstead then let down the high-pitched gable of the front, I am here for the credit of the parish to rejoice in its restoration. J. W., marked on a corbel, which seems an integral portion of the flat roof of later times, seems rather a dangerous witness against our Abbot John, unless Mr. Street, whose evidence on the other side was given during the recent controversy, to the satisfaction of a very influential court, can get him off. If Abbot John, and not some successor just before the Reformation (as believed by the eminent architect whose authority I have just quoted), did lower this roof, he did it to match his lowered aisle roofs, and he lowered them, as we have seen, to gain the power of greater internal enrichment.

But I shall weary you. You will see, however, that I have ventured upon a subject which cannot be very briefly disposed of. If we are to see the west front of St. Alban's take its original rank among the great west fronts of our English Cathedrals, we have, you will observe, authority for the accurate reproduction of its lower portions, the gable over the west window, the uppermost arcade of the front, and the towers alone, unless further discoveries of their fragments can be made, being left for adaptation from coeval examples. Just, however, as these matters were engaging my very serious attention, I found that what had appeared likely to wait long before it could pass from the phase of inquiry and speculation, was about, without loss of time, to enter upon the region of practical work, through the munificence of Sir Edmund Beckett. As far as I understand the intentions of my talented friend, it is his wish to undertake the restoration of the ancient portals, which the Freemasons of England at one time hoped to be able to do, and to carry out the Early English arcades of the west front according to the remains of them which have been brought to light; he will also complete the great gable of the west front, with Early English details. I should have rejoiced had he found it possible to raise even the south tower, of which the particulars have been discovered, up to the level of the uppermost arcading of the front, thus reproducing the magnificent breadth which gave this west front its special dignity; but we must not ask one so willing to give for too much at a time. Constructive reasons will, it appears, make some substantial angle turrets necessary; all that we can ask is that they may be so constructed as to necessitate the removal of no old work, and may hereafter give place to towers, should it ever be found possible to build them. The fact that Sir Edmund has placed his plan in the hands of Mr. Chapple (our excellent clerk of works, and now Mayor of our city, whose unavoidable absence to-day I deeply regret) to work out in detail, is an earnest that the utmost care will be taken to preserve all ancient traces, and carry out the undertaking as far as practicable on the old lines. We have suffered greatly at St. Alban's hitherto from over-much advice. True, the building is one of great national importance, but the advice we have hitherto received has generally been such as to show how best to do nothing to preserve our great church than how best to bring it again to its former glory. Had our funds been larger we could have done our work with greater satisfaction. Nevertheless I believe that what we have done, after careful thought, and the best counsel we could obtain, has been well done, and I trust that we may be permitted to hand down to generations yet to come one of the noblest churches we have received from our ancestors, secure in its structure, perfect in its details, and adapted for a renewed life of work and of glorious worship, to the praise of Him whose house it is, and for whose great glory His servants designed it in the days of old.

ST. ALBAN'S CATHEDRAL.

The following is Sir Edmund Beckett's reply to Mr. Toulmin's letter to the *Times*, which we reproduced last week on p. 455:—

"Poor Mr. Toulmin, of Childwickbury, near here, is suffering from a complication of disappointments. The other day he summoned the committee on whose behalf he professes to write, and which only survives to try and pay the hopeless debt which he helped them into in my absence last year by a little mistake of £1,600 in the accounts, and not one of them would come, as he only wanted them to incur another debt, coupled with a lawsuit if they did, by undertaking the restoration of the present decayed and vile west window. He pretended to have an estimate of about £400 for it, as he says to you, knowing very well that the very able clerk of the works, who has been here for ten years and whom he had always before sworn by, had estimated it at £2,000, and the builder's estimate was rather more, for what must be done by whoever undertakes to make it stand. No doubt he thinks he knows better. A great man in this country is quoted for saying of him that 'whatever he wants he believes,' and, I must add, asserts. He then wrote a letter accusing the committee of 'half-heartedness and lukewarmness,' enlivened also by some doggerel verses, which he delights in. And now in despair he sends off his dirty linen to be washed with the sheets of the *Times*. As he does, I have no objection to mangle it for him. I know nothing of his petition to the Bishop, who has no more power in the matter now than you have, except by report and from himself. He has been for six weeks pestering people of all degrees to sign it as a favour to him, and some of them have done so to get rid of him, saying that they knew that it was useless; and the day he sent it he confessed that he knew that himself. I have good reason to believe that not much more than half a dozen of the signers have even seen the design of the window they profess to dislike; for the design that was exhibited here and deposited in court omitted all details of window-tracery, and expressly reserved power to alter any details preserving the general outlines shown. Several persons in this city have told me they would get up a petition the other way signed by twice as may people, including many of his, in a few days, if I wished it. I told them that it was not worth the trouble. In fact, the thing has been the joke of the neighbourhood. He did not, of course, disclose the fact that he had been bothering me for nearly a year, while he thought I was going to do what he now pretends to want, begging me on no account to restore such a vile window as that, but, on the contrary, to destroy, not only the tracery, but all traces of any great west window, and to substitute some '19th century' lancets as a purely imaginary restoration of the unknown ones of the 12th century; for nobody worth naming pretends to know their size, number, position, or anything about them. When he at last became sensible that I did not mean to attend to any such nonsense, he turned round within a week and alarmed me by announcing that he was 'going to move heaven and earth' to make me restore the present window. Everybody knows that all he cares for is to be able to boast that he has meddled with some effect one way or another, and particularly that he has made me do something. This also is vanity and vexation of spirit to him. As he quotes the Bishop, I must say (what he knows very well) that the Bishop in several letters to me, early and late in the business, has called my original design, on which he forwarded the faculty, 'beautiful,' and has spoken as disrespectfully of the present window as Mr. Toulmin himself. That design showed the very window that is going to be executed as a probability, in case the present one was found too ruinous to stand without great repairs. The new one has been approved and admired by every one who has seen it, except himself, for his present object, including some very good judges who have equally condemned the present one. At least 20 times as many persons have done so as all who have seen it and signed his absurd petition. As he lugs in Mr. J. O. Scott, evidently with his consent, I am obliged to tell that it was the exhibition of a copy of a rival design for the whole west front by him that brought over all the local opponents of my faculty, saving always the implacable archdeacon, who preferred that the nave should fall to having it saved by me, and that nobody was so loud in preferring my design as this new agitator against it. And yet he has the face now to complain of my only offering the job to Mr. Scott on condition of his carrying out the approved and authorised design. Having now got all the drawings done, I can only say I am very glad he refused my offer. His assertion that my faculty only authorises 'repairs' is a somewhat striking specimen of believing for the time whatever he wishes, seeing that he was present at the Chancellor's judgment, and was reminded by me very lately of what the faculty is, and knows perfectly well that any restoration of the west front must be an invention, as all except the middle is flat brick walls with not even a door or a window at present. The one thing which is the whole truth and nothing but the truth in all his letter is that the work was duly ordered as soon as the drawings were sufficiently complete, so that it will go on if I am murdered to-night in compliance with a printed invocation circulated by some anonymous doggerel verse-writer for another Fitzurse, who disposed of my namesake in the early days of abbey-building, and if all the crazy societies in England pass some more resolutions and move for the injunctions which Mr. H. J. Toulmin thinks he understands as well as architecture; and so he does, no doubt. I have only to say to the few respectable people who honestly think that all future generations ought to be condemned to gaze on modern copies, called restorations, of vile and ugly fabrics, because they have 'associations' with their recollections all their lives, that I do not agree with them—or argue with them; only that I am not going to spend £20,000 or £30,000 to gratify whims of that kind; nor would I let them spoil a design which has received such unusual approbation if they offered to pay for spoiling it themselves, which they have not the smallest idea of doing. Much less shall I gratify such a meddler as this by letting him have to say that he has meddled with success. Dogs that go out to bait quiet bulls must not be surprised if they get tossed and gored."

RHIND LECTURES IN ARCHÆOLOGY.

THE SYMBOLISM OF THE MONUMENTS.

THE fourth of the Rhind lectures by Mr. Joseph Anderson, keeper of the Museum of the Scottish Society of Antiquaries, was delivered on Thursday week.

Mr. Anderson having intimated that he proposed in this lecture to speak of the symbolism of the monuments, said the conditions of the question to be discussed would be best understood if attention were first turned to the most prominent and striking feature of the Christian monuments of our own age. Was it not, he asked, a striking feature of those modern monuments that the elements of their symbolism were not wholly and exclusively Christian in character and origin? The obelisk, the pyramid, the broken column, the urn artistically draped—these and other forms borrowed from paganism continued to be used in our churchyards. This might be taken as proof that the system of Christian monumental symbolism did not necessarily consist solely of forms and representations that had exclusive reference to the faith and hope inculcated by the Christian creed. He meant to show further, that, as matter of fact, so far as we had positive evidence, and as matter of inference, so far as such evidence was wanting, the earlier systems of symbolism exhibited similar features, and therefore that there had existed in past ages, as there existed now, a feeling for monumental symbolism, expressing itself in modes regulated by popular preference irrespective of the influence of church or culture. It was admitted that Rome was the cradle of the Christian art and symbolism that spread gradually over Europe. In different areas we found it modified by the quality of the culture on which it was engrafted, but in its essence and spirit it was always recognisable as the art and symbolism which passed through its initial stages in the Catacombs. Their most remarkable feature was their decoration; the special feature of that decoration was its symbolic character, and the most remarkable feature of that character was that it carried on the previously existing pagan decoration, rejecting certain forms and subjects as unsuitable, altering others, and adopting a number without modification or alteration. This was especially the case with ornamental accessories. Symbolic personifications of rivers, cities, day and night, the sun and moon, the winds and seasons, &c., which were so common in pagan art, were also carried down into the system of Christian symbolism. Thus, in Scripture subjects, the Jordan was found still represented as a river god, the whale as a sea monster; while representations of Orpheus charming the beasts were frequently found associated with figures of the Good Shepherd and other scenes from sacred history. These sacred scenes, and especially Christian symbols, such as the fish, the anchor, the ship, the dove, the lamb, &c., of course predominated; but the significant fact was, that the system of Christian symbolism in its very earliest stages was not unmixed with forms and representations which were not Christian, but pagan, in their origin and original application. Such being the character of Christian symbolism at Rome, it was not surprising that such should also be the case in the later stages of local development of the same system throughout the provinces. If the Christian symbolism of the provinces was not an independent system, separately developed in each separate area, we ought to find it exhibiting the same general features everywhere; and in so far as it was derived from the parent system, presenting the same forms and representations, modified or supplemented by the special culture of the different areas. But as the culture which produced those modifications was lower in the provinces than in Rome, and most of all in those remote provinces which bordered on barbarism, it necessarily followed that the further the system of symbolism became removed from its source, the greater was its departure from its original purity of art and unity of composition. And this, in point of fact, was what we found in almost every area of Europe in which it appeared. The earliest symbolism of Christian art was, in its main features, manifestly derived from the same earlier symbolism in use in the common centre from which it was disseminated; but the subjects, copied from copies unintelligently and inartistically reproduced, became gradually disguised and degraded to such an extent as to be ultimately unrecognisable unless where the whole series of steps of degradation was demonstrable. If, therefore, the whole number of the monuments existing in any given area had suffered diminution, through lapse of ages, we must be prepared to find among those that remained examples of this process of alteration of type by degradation. Among these there might occur instances in which the process had not gone so far as to obliterate the original character of the type, but there almost certainly would be others in which the alteration has gone so far as to render them obscure and unintelligible. While, therefore, a system in no way remote from the source of original development, was in the main and necessarily a derived system, it did not follow that in all its manifestations it was capable of being explained or understood from simple comparison with the original system, if the links were wanting that originally bridged the distance between them. But, further, it was clear that a system in the main derived, consisting of simple variants of universal types, might be associated with and supplemented by a series of types which were of independent origin. In this case, so far as its derived characteristics had not been obliterated by degradation, the system would be capable of explanation from external evidence; but so far as it was of independent origin, if it was to be explained at all, it must either contain the explanation within itself, or the key must be furnished by contemporary record. It was plain, from the most cursory inspection of the Scotch monuments, that their symbolism possessed this double character. They were crowded with symbols which did not occur in any instance out of Scotland, and were therefore of independent origin; but they were also covered with symbolic representations which were plainly simple variants of universal types, and hence the significance of those subjects might be assigned to them by their analogous use and significance in other ways and other associations. For instance, it was at once apparent that the figures of the cross, of angels, and evangelists were strangely associated with figures of centaurs and sirens, griffins and fabulous monsters derived from Greek and Roman paganism. In this respect, however, these Christian monuments of Scotland did not differ from the Christian monuments of the early Church, either in Italy or in any other area. But we were not hastily to conclude that those symbols were present on those Christian monuments in their primitive pagan significance. That would imply not only incongruity of association, and unfitness of significance, which could not be assumed, but it would also imply that they had been derived from their pagan source directly, and not mediately through the general system of symbolism into which they had been incorporated with special applications suited to its Christian character. After comparing the treatment in the Catacombs of such subjects as the Temptation, Daniel and the Lions, and Jonah and the Whale, with the representations of these found on Scotch and other monuments, the lecturer said it was clear that among the Scotch pictorial groups there were a number which were certainly of the same type of Scripture subjects as was found on early Christian monuments in Italy and Gaul. They were modified in their treatment by the peculiar art instinct, and usages of the people among whom they were found, but they were not so greatly disguised by this peculiar treatment as to be unrecognisable. It followed from this that among the pictorial groups left unexplained there might be other scriptural subjects with respect to which this peculiar treatment might have gone so far as to render them unrecognisable. This consideration must operate as a caution against the hasty adoption of the inference that all the subjects which we could not refer to a Scripture origin must necessarily be secular or historical, or representative of the every-day life of the people of the times. He did not except from this caution the great slab at Forres. No monument was known to bear any commemorative representation, sculptured or inscribed, of any historical event occurring within the country in early Christian times; and the establishment of such an interpretation of the sculptures on the Forres monument would be the establishment of an exception to the general rule, and could thus have no influence on the question of the interpretation of other monuments. It was true there were apparently scenes from real life on many of them, and that they were treated in such a realistic manner that the costumes and weapons might be accepted as those of the country and time; but this was what happened everywhere, and affected only the artistic accessories of the subject, not the nature of the subject itself. While we might accept the dress and weapons of the man tearing the jaws of a lion on a St. Andrews monument as real representations, we could hardly accept the subject itself as a subject that ever happened, or could have happened, in Scotland. So when we found the representation of a stag hunt, we might accept the costume and accessories as conceived in the manner of the time, but we were not required to regard the subject itself as having any realistic reference to the life history of the individual commemorated. In like manner, when we found a ship sculptured on a monument, we might accept the form and rig of the vessel as realistic representations of those in use at the time, but we should not be warranted in connecting the subject itself with any incident in the life of the individual, any more than in so connecting each of the other separate subjects on the same monument, most of which were manifestly symbolic and sacred. The interpretation which assumed that those pictorial subjects were historical was supported by no external evidence. On the other hand, we knew that from the earliest times the ship and the stag were common popular symbols of Christian monumental art. The range of this popular form of symbolism was wide, and it held its place for many centuries; and in this view there was no incongruity in the appearance of such forms among pictorial representations of gospel histories. There existed a popular system of spiritualising the facts and fables of natural history, as natural history was then known. This was set forth in the Divine Bestiaries of the early Middle Ages; and the explanation there given of the significance of certain animals completely removed the idea of their incongruity on monuments, and showed them to be appropriate elements of divine symbolism. It was clear that pictorial groups and processions of animals, real and fabulous, had a symbolical meaning, and that it was for this reason, and not because they were merely pictorial representations, that they were fitly placed on the porches, capitals, and walls of churches, as well as sculptured on monuments. He did not say that the system of symbolism described was ever formally sanctioned by the ancient Church, any more than the system now or formerly so prevalent in our churchyards was ever formally approved by the modern Church. So early as the 5th century the tendency to this species of symbolism was viewed with displeasure by the austere fathers of the Church; but pictures had been said to be poor men's books, and in all ages, and under every form of culture in which pictorial representations had been used, systems of symbolism had been common and popular. It might not be easy for us to see the appropriateness of such a system, or appreciate the significance of the moral allegory that underlay this conventional mode of representation; but it was enough for us to know that those subjects were so used in MSS. and in churches from the 6th to the 12th centuries in all the most cultured countries in Europe. Knowing this, we knew also that they were not inappropriate or destitute of significance when we found them on monuments associated with more common and obviously symbolic sculptures. They did not, however, occur on monuments, unless in Scotland, at least with the same frequency and persistence; but this was not out of harmony with the general character of those monuments because they were in most of their features entirely unlike the monuments of any other area. This unlikeness was specially apparent in the fact that they bore a series of symbols which had never appeared on any other monuments. These were associated with pictorial subjects, but were not themselves pictorial; they were conventional figures, bearing no necessary resemblance to natural objects; they were, however, associated and conjoined in symbolic use with other symbols which were representative of natural forms, such as the fish, serpent, &c. The most common figure was a crescent. Another was in the form of two circles connected by a band; and this was sometimes combined with a rod doubly bent and floriated at the ends. A third was a rectangular oblong, bearing some resemblance to a house with the door in the centre; and a fourth took the form of an archway. There was no evidence that these figures represented personal ornaments; nor did they appear to have been insignia of rank or heraldic devices. After pointing out that the symbols in question were found in conjunction with symbols known to be of sacred character, the lecturer said that, whatever might have been the significance attached to them, it could not have been of a trivial or unimportant character. From their place in the front rank in the system of symbols, and the wide range of application they exhibited, their arbitrary significance appeared to have been considered of primary importance—of an importance almost equal to that veiled in the similitude of the cross itself, with which they were so often associated. Further than this he could not proceed.

(*To be continued.*)

RECENT METHODS OF TESTING PORTLAND CEMENT.

At the meeting of the Manchester Association of Engineers, on Saturday last, Mr. W. H. Bailey, of the Albion Works, Salford, read a paper on Some Recent Methods of Testing Portland Cement.

Mr. Bailey said Portland cement as a material of construction had increased in popularity during the last twenty years, but especially so during the past five or six years, owing entirely to the scientific methods used both in its manufacture and in the methods of testing the material by those engaged on Government, municipal, and other large works. At a recent meeting of the Society of Civil Engineers a communication was read from Mr. Higgin, who has charge of the extensive operations at Buenos Ayres under the direction of Mr. Bateman as engineer-in-chief. The sum of £2,000,000 sterling has been spent in city improvements there, and the spending of this money has afforded a good opportunity of showing what can be done with cement concrete in almost every form that could be devised. No stone was to be obtained in Buenos Ayres; in a radius of two hundred miles not a pebble could be found. When the works were begun the province produced no bricks fit for use, and recourse to concrete became imperative. About eleven miles of large subterranean conduits had been built almost entirely of concrete, as well as twelve miles of intercepting sewers and twenty to thirty miles of collecting sewers. Concrete has been used for the workmen's houses, for the roofs of engine houses, in the copings of walls, tops of columns, retaining walls, filters, settling beds; indeed for every conceivable purpose. Mr. Higgin states that for all the fine work the mixture used was one part of Portland cement to six parts of course sand. Portland cement is composed of silica, alumina, and carbonate of lime. This is produced by mixing clays and limestone or chalk in combination with water, which mixture, after being baked and calcined in a kiln, is ground to fine powder. Mr. Henry Reid, who has written many books on the subject, insists that it is absurd to send this useful material many miles anywhere, as the ingredients for its manufacture can nearly always be found at one's elbow if we only look. In many rivers and creeks the raw material exists. Common flint, pit clay, marine clay, the shales and sand of Warwickshire, Derbyshire, Northamptonshire, and Somersetshire should be used for cement making. For the like purpose Mr. Reid names the basaltic columns of the Giant's Causeway, the limestone formation at Kendal, and the various lavas and slate deposits in different parts of this country. The strength of Portland cement increases with its fineness. The most popular method of testing the cement is by subjecting it to a severe tensile strain, but much can be said in favour of testing by compression, and the latter would be more in use but for the costliness of the apparatus. Mr. Bailey described a simple hydraulic compressor for the testing of Portland cement, which he had designed. It was possible, however, that cement should be tested both for tensile strength and resistance to crushing. Professor Thurston (America) has introduced a method of testing by torsion or twisting. The Thurston Testor not only gives the torsional resistance, but also the limit of elasticity and the exact angle of torsion. The limit of elasticity is the amount of twist a material will bear without becoming permanently distorted. The quality of elasticity is of considerable importance in a cement, especially where it is used for concrete work in footpaths and roads. Mr. Arthur Jacob, the borough engineer of Salford, has given considerable attention to the tensile testing of Portland cement. He has introduced cylindrical moulds. The shape is perfect, and by a careful filling of the moulds and exact measurement of the water used in each case, tests are made under conditions which seemed to him (Mr. Bailey) to be rigidly equal in every particular. Mr. Jacob's machine has the weight—which consists of a long can into which a small stream of water flows—placed at the end of a lever. This enables the test to be applied in a very gradual and nearly imperceptible manner, without any vibration; in fact, the operator may sit down and watch the machine, after the tap has been turned on, until the fracture is effected. The height of the water in the cistern is indicated by means of a glass tube similar to the water-gauge glass of a steam boiler, the graduation being painted down the can or cistern. When the material is broken a small trigger closes the tap, and prevents any further supply of water. So uniform are the tests by Mr. Jacob's system that, with good cement, the figures obtained scarcely vary. On September 26, six samples were taken from one bag and were tested with the following results:—810, 815, 820, 820, 820, 820. Mr. Bailey said he had had considerable experience of testing, but with any other form of clip and under the most careful conditions, no results like these had ever come under his observation; and if tensile strain is the proper one to place on Portland cement, Mr. Jacob, he thought, had introduced the most perfect form of testing. But it was desirable to caution those who consider a high tensile strain the best, that this mode may result in the manufacture of a dense and treacherous cement, and elasticity was a quality which in future would have to receive quite as much attention. In past years Portland cement has been ill-treated. Ignorant and unscrupulous persons have sold and used cement under that name and have brought it into undeserved disfavour. For workshop use it is invaluable. It preserves iron; indeed, it is used for preserving the insides of iron boats. Its uses and applications are innumerable—tanks, walls, foundations, piers, and solid lighthouses in one piece are built of it. As its qualities become better known to mechanical engineers, it will be more extensively employed than at present.

In the discussion which followed Councillor Asquith said that water engineers generally gave it as their decided opinion that puddling by cement was much more trustworthy than clay puddling, and more durable. At the reservoirs at Woodhead clay puddling had repeatedly given way, and cement had eventually taken its place, and with great success. From the description given by Mr. Bailey he felt convinced that upon the proper mixing of the cement depended its success or failure. The application of cement was, in his opinion, still in its infancy.

Mr. W. H. Bailey, replying to several questions raised, said that sand intended to be used in the mixing should be dry and the process of mixing carried out under cover. The quantity of water used in mixing was $\frac{1}{4}$lb to every lb. of concrete. Too much care could not be taken in the mixing, and in many instances where cement had failed, such failure had been clearly traced to some want of attention in this particular. This had been proved by the entire destruction of a large breakwater in the South of England from the simple reason of a few rusty nails getting into the cement during the mixing. Replying to the question as to whether old cement could be renewed by heating in furnaces, he said he was not aware that such had ever been tried. No doubt some cement in its unmanufactured state did deteriorate in quality if exposed to the atmosphere, but when once made into concrete, provided the mixing had been performed in a proper manner, its strength and quality would continually be improving. Cement which took the longest to set generally proved the strongest. He regretted that time had prevented him from making the paper so complete as he could have wished but at some future time he hoped to be able to do so, when he would endeavour to say something about Mr. Thurston's system of testing by torsion, not only as applied to metals, but also to cement.

CHIPS.

The town commissioners of Weston-super-Mare have received a reply from the Local Government Board to an application for consent to substitute cement concrete pipes for a half-brick sewer in the sewage scheme for Weston-super-Mare, now in course of construction. The Board state that, after considering the local report of their inspector, Mr. J. S. Smith, that concrete pipes are liable to have the ends injured in transit, and that, with pipes so injured, it is difficult to make perfectly sound joints. The Board had, however, already allowed the use of such pipes, and the commissioners could use them on their own responsibility.

The local board of Normanton, Yorks, have adopted a report, as to sewering the district, prepared by their surveyor, Mr. Reid, and instructed him to devise plans and specifications for the execution of the work. The estimated cost is £2,000.

At the Somersetshire Quarter Sessions, held at Wells, on Tuesday, elections took place to the offices of assistant county surveyor and county analyst. For the former appointment there were 17 candidates, of whom the committee recommended to the court three, but all the names were voted upon. Mr. Charles E. Norman, civil engineer, of Taunton, was elected, receiving 54 votes, Mr. T. J. Hickes, district highway surveyor, of Shepton Mallett, coming second with 20 votes. Dr. H. J. Alford, of Taunton, was elected as analyst.

A vestry meeting was held at Cromer, on Thursday week, to consider a preliminary estimate from Mr. Ewan Christian for re-building the chancel of the large Perpendicular parish-church. Only slight ruins of this chancel exist at present, and it is traditionally asserted, as in most other instances of mutilation of East Anglian churches, to have been destroyed by Cromwell. The estimate amounted to £9,706, with 10 per cent. extra for contingencies. Considerable discussion ensued, Sir Fowell Buxton declaring that he would rather not have the chancel, as it would render it difficult to hear in the church, which was already too large for the population, and the glare of light would be trying. It was stated that Mr. Christian had reported that the acoustic properties would be improved, but it was decided to leave the matter in abeyance unless the committee can obtain sufficient subscriptions to justify them in going forward with Mr. Christian's plan.

The directors of the London and North-Western and Lancashire and Yorkshire Railway Companies have decided to erect extensive goods warehouses near Whitehall-road, Leeds. The plans have been prepared by Mr. S. B. Worthington, engineer, of Manchester.

The local board of Stainland-cum-Old-Lindley, near Huddersfield, last week appointed Mr. Joshua Helliwell as their surveyor.

The Town-hall at Sowerby Bridge has just been sold for £4,400, by the limited company to whom it belonged, to the Joint-Stock Banking Company, for the enlargement of the bank premises.

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ILLUSTRATIONS.

WEST FRONT OF ST. ALBAN'S ABBEY.—ST. MARY'S PRIORY, FULHAM-ROAD.—IRON SCREEN, CADBURY HOUSE, SOMERSET. — BUILDINGS IN THREADNEEDLE-STREET FOR THE MERCHANT TAYLORS' COMPANY.—BOARD SCHOOLS AT BATLEY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

WEST FRONT, ST. ALBAN'S ABBEY.

For a description of these sketches see Canon Davy's article on p. 466.

ST. MARY'S PRIORY, FULHAM-ROAD.

This is an addition to very plain buildings which have hitherto served as the monastery of the servite monks, or servants of Mary, founded in Florence in the 13th century. The site is numbered 264, Fulham-road, close to the south end of Redcliffe-gardens. Owing to the want of space, the Catholic Church, built in 1875, which the monks serve, had to be placed in the rear of the old house; later on, a small addition was made in front of the old house, and this building now forms the communication between the old house and the building shown in our view. Besides providing what accommodation was required by the growth of the order, it serves to direct the eye to the situation of the church, which had hitherto been difficult to find by strangers. The accommodation provided consists of three reception rooms on the ground floor, a community room and three cells on the first floor, and a noviate and four cells on the second floor. The corridors are all over 6ft. wide, to serve the purpose, in a small way, of cloisters, which cannot be obtained on such a limited area. The walls are built of ordinary stock bricks, with Ham-hill stone dressings, the same as the church, which, likewise, is in the Early English style. The building is unfortunately over-topped by adjoining buildings. All the new buildings on the site are from the designs of Messrs. Joseph A. Hansom and Son, of 27, Alfred-place, W., South Kensington, under whose supervision this last addition was built by Mr. Frank Wilkins, of 32, Fulham-road, the cost being £1,620, which also includes several changes in the old buildings. The Ham-hill stone was supplied, ready worked, from the quarries of Mr. Charles Trask, at Norton-sub-Hamdom. The joinery is of pitch-pine, and the roof slated. The ground-floor corridors are laid with tiles. Over the front door are carved the insignia of the Servite order, the letters M. and S., for Maria Servi, forming part of a sevenfold lily eradicated, representing the seven founders of the order, the whole crowned. The elevation is a welcome addition to this part of the Fulham-road.

IRON SCREEN.

This screen, the drawing of which was exhibited at the Royal Academy, was designed by Mr. Walter Lane, for Messrs. Conrath and Sons, of North Audley-street.

CADBURY HOUSE, SOMERSET.

This house, the residence of the Rev. J. W. Hardman, LL.D., situated in the high country overlooking Clevedon and low-lying land west of Bristol, built about seven years ago, may be said to be jointly the work of the architect, Mr. T. Drew, and the owner, an ingenious archæologist. The house embraces a portion of a small villa house, previously existing, which has been gabled and worked into the general design. The newer portion of the house, consisting of the porch, screened hall, solar, staircase, dining-room, &c., is arranged on lines familiar in many plans of old English manor houses. Taken in connection with the circumstances that it has been built up in great measure of miscellaneous derelict gatherings of the owner, saved from destruction by him about his neighbourhood in past years, consisting of old fire places, mullioned windows, oak panelling, &c., all introduced with skill and ingenuity, it would easily be mistaken by many skilled ones for a very genuine old English manor-house. It seems a legitimate use enough of many interesting things which would otherwise have been lost, and this picturesque reproduction of an average old English house harmoniously contains an extensive and valuable collection of old English furniture, curiosities, and articles of *virtu*.

NEW BUILDINGS FOR THE MERCHANT TAYLORS' COMPANY.

These buildings have recently been erected on the east and south sides of the garden in the rear of the Merchant Taylors' Hall in Threadneedle-street. The ground floor contains a court-room, a committee-room, and a library, and on the other floors are various offices and apartments. The windows, strings, &c., are executed in Portland stone, the walls are faced with Spinkwell stone, oat tooled with vertical strokes, with margins of horizontal strokes, and the roofs are slated with Eureka green slates. The buildings have been designed by Mr. Edward I'Anson, and Mr. Georgo Shaw, of Page-street, Westminster, was the contractor. The drawings were on view at the recent Academy exhibition.

CARLINGHOW BOARD SCHOOLS, BATLEY.

My object in having these drawings illustrated is to show the great difference in cost of buildings now and six years ago. In your contemporary the *Architect* of August 16th, 1879, drawings of mine were illustrated of a school I am now completing, and I gave the comparison of cost in various ways, which from the correspondence it created afterwards, proved to be interesting. This perspective drawing was prepared before the plans were sent to the Education Department for approval, and does not show the exterior exactly as it is now being built, as the plans were returned with a request that part of the ashlar and ornamental masonry, such as architraves, centre pediment, gable fillings, &c., should be struck out, which was done; and by a careful calculation since the design was reduced, I find the saving in cost in accepted scheme is £149, priced out at the accepted contract schedule. These schools contain three departments, as shown by the plans; the infants' school contains in school and class-rooms 2,250 super. feet, and accommodates 250 children, being exactly 9 super. feet per child. The girls' and boys' school each contains 2,000 super. feet and accommodates 200, which gives 10 super. feet each. The schools were let by public competition, and the accepted tenders are as follows, viz:—

Masons' and bricklayers' work..........	£1,870	0	0
Carpenters' and joiners' work..........	738	0	0
Plumbers' and glaziers' work	93	0	0
Plasterers' work	112	10	0
Ironfounder and smiths' work	60	0	0
Slaters' work	143	12	0
Painters' and stainers' work............	40	0	0
	£3,057	2	0

These contracts include all excepting the hot-water apparatus and gas-fittings. The total cost being £3,057 2s., and the accommodation 650, it gives the cost upon these contracts as £4 14s. per head only. The quality and weight of material are similar to what I used for Board Schools seven years ago. The whole of the external walls are of stone, three of the fronts being of the best pitched delph, one of the hardest and best wallstones in the country. The ashlar is the best white from Holmfirth. The whole of the joiners' work and floor-boards throughout are of pitch-pine, with pitch-pine wainscot round all rooms. The roof is partly camp ceiled, with part of each binding exposed, which is again of pitch-pine. All internal doors are $1\frac{3}{4}$ thick and have glass top panels. The top part of every window is hung to open inwards. The slating is Bangor, 24″ × 12″. The ventilation will be effected by a perforated board on top side each tie-beam, admitted in the false roof by doors worked by cords from below and from thence to the outside by open louvres in gables. I have adopted this system in a score similar buildings before, and so far have found nothing to answer better. All the rooms, lobbies, passages &c., will be effectually warmed by Perkins' system of wrought-iron hot-water pipes. The following particulars are copied from a daily paper of August 6th, 1874, which gives a long account of eight Board Schools just completed for the Bradford School Board, and are, as the figures will show, some of the most expensive of any erected in England.

Name of School.	Number of scholars	Cost of Land.	Total cost.	Cost per head.		
		£	£	£	s.	d.
Barkerend	500	3,460	14,976	29	19	9
Bowling Back-lane	500	2,250	13,659	27	6	4
Dudley-hill	480	2,300	12,300	25	12	6
Feversham-street...	800	8,750	23,832	29	15	0
Horton Bank.........	200	700	6,208	31	0	9
Lily Croft	600	3,350	15,150	25	5	0
Ryan-street	800	2,800	18,029	22	10	8
Whetley-lane	600	3,600	12,275	20	9	2

I may add these schools, as far as I have seen, are of the most substantial character and costly finish.—Walter Hanstock, A.R.I.B.A, Batley.

◆

CHIPS.

The parish-church of Woodhouse-Eaves, Derbyshire, was reopened on Wednesday week after restoration, effected at a cost of £2,000. The church has been reseated, the west gallery removed, the tower-arch opened out, new floors laid, and the whole building re-roofed. A south transept, and a new organ within it, are the gift of Sir Titus Salt; a north transept has also been thrown out, and contains four stained-glass windows in memory of the Herrick family, of Beaumanor Park, by Messrs. Clayton and Bell, of Regent-street, London. Mr. Ewan Christian, of London, was the architect, and Mr. Black, of Barrow, was the contractor.

At the last meeting of the town council of Taunton, a report was made on the progress of the works for increased water supply, which have been carried out at Leigh-hill, under the supervision of Mr. J. H. Smith, surveyor. When the works were purchased a year or two since for £20,000, the minimum supply was 52 gallons per head. About £8,000 has since been spent on the works, with the result that the minimum had been raised from 52 to 70 gallons per minute, and there is reason to expect a further large increase in yield.

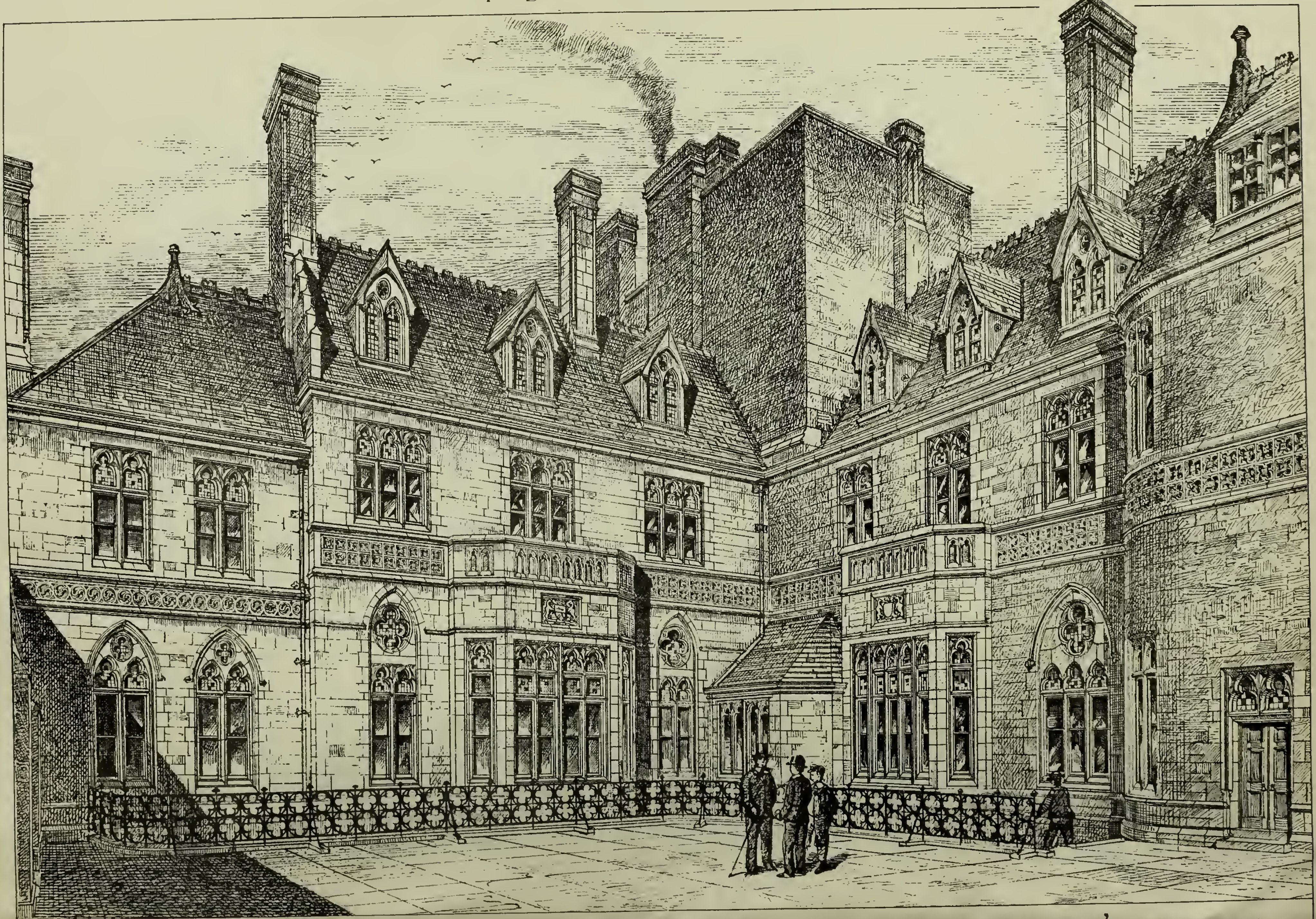
The parish-church of Hartshead-cum-Clifton, near Halifax, is in course of restoration, from the plans of Mr. W. Swinden Barber, of Halifax. A new porch, Norman in character, to harmonise with the ancient inner doorway, and an organ-chamber, are being added; the north aisle wall is being rebuilt, and the whole of the roofs rebuilt.

The Dudley school board on Monday adopted plans by their architect, Mr. Davies, for the enlargement of Netherton board schools.

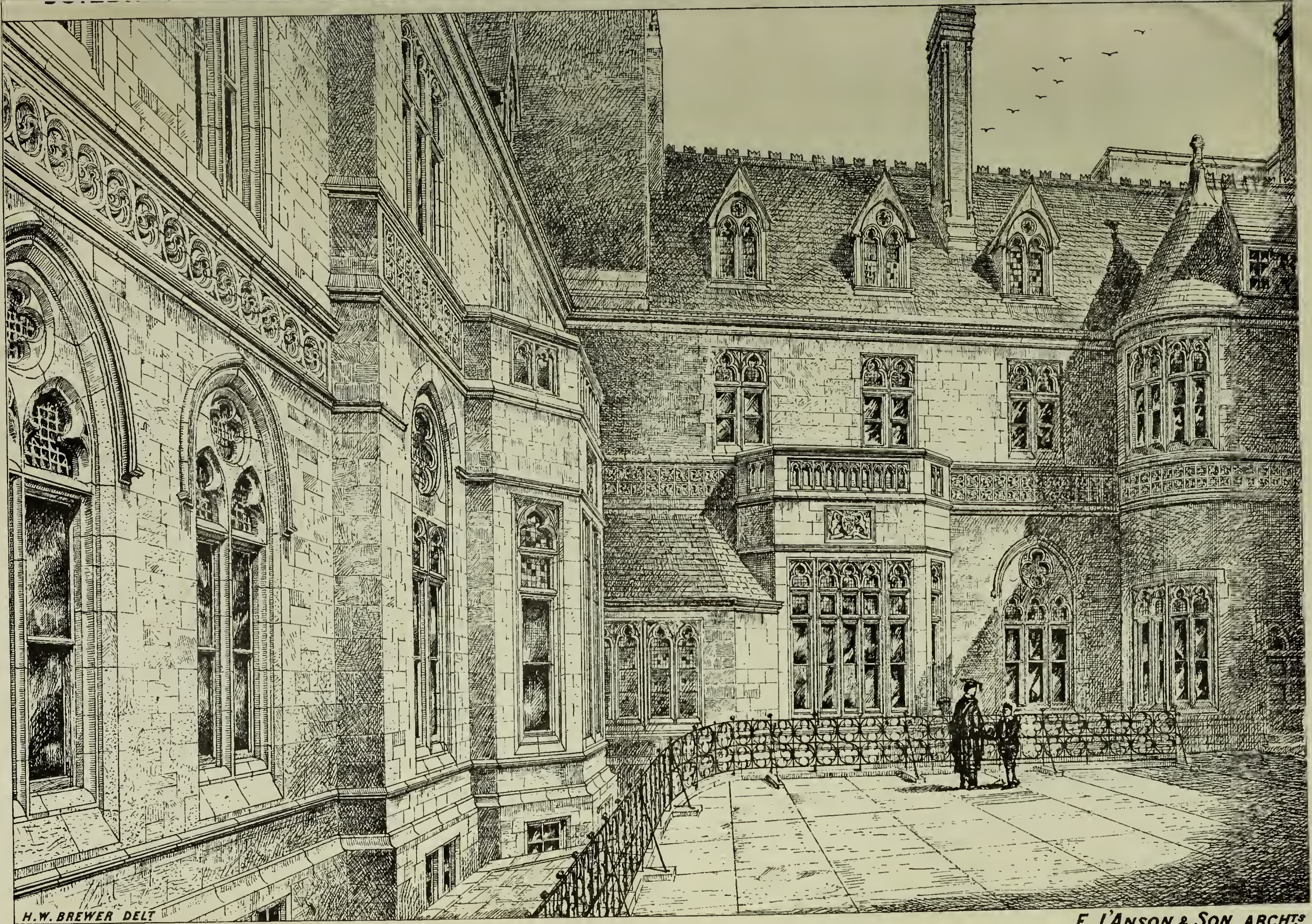
Mr. Frederick Edwards, jun., is preparing for publication a new and revised edition of his book on "The Ventilation of Dwelling-houses and the Utilisation of Waste Heat from Open Fire-places," with a chapter on the "Country Parson's Grate," and other modern fire-places.

There are two candidates for the Disney Professorship of of Archæology at Cambridge University, vacant by the resignation of Dr. Chuichill Babington, viz., Mr. Percy Gardner, of the British Museum, formerly Fellow of Christ's, and the Rev. S. S. Lewis, Fellow of Corpus Christi.

Pumping was restarted in the shaft of the Severn Tunnel on Thursday week, in the presence of Sir John Hawkshaw and Son, the engineers. The engine now employed is one of the largest of its kind at work in England; the cylinder is 6ft. 3in. in diameter, and the pipes are 3ft. 3in., the total throwing power being equal to 2,250 gallons of water per minute. Three smaller pumps have also been set to work in the shaft, and the water is being rapidly got under.



BUILDINGS IN [illegible] STREET FOR THE MERCHANT TAYLORS' COMPANY



H.W. BREWER DELT

E. I'ANSON & SON ARCHTS

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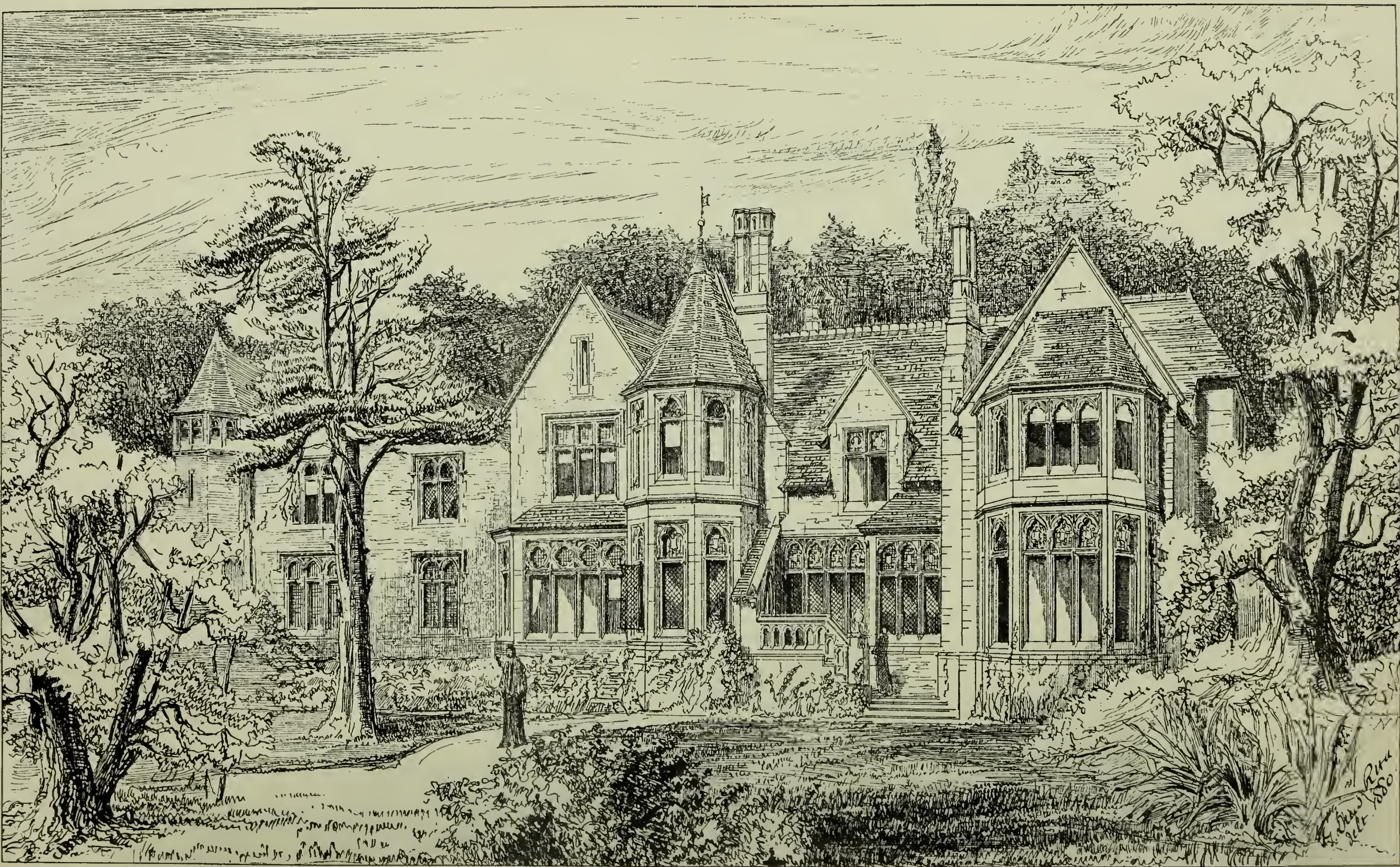

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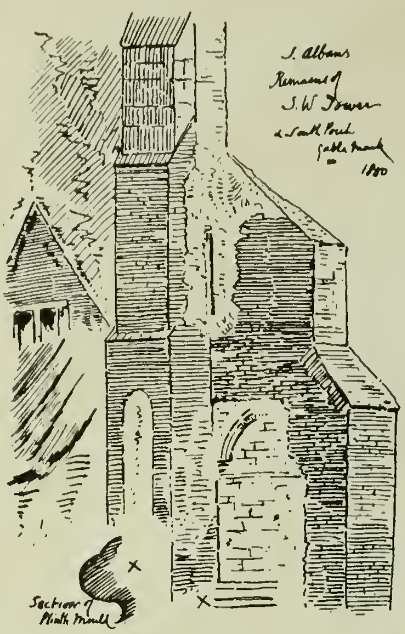
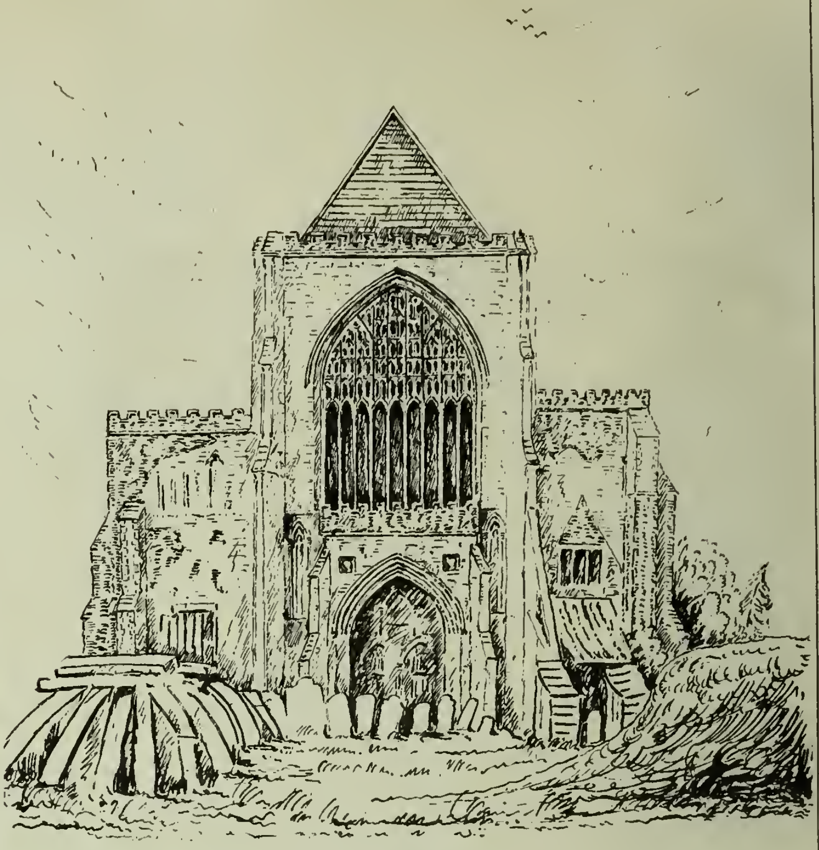
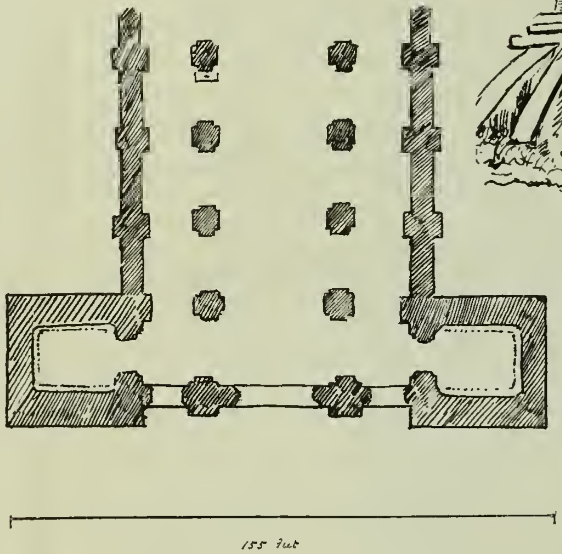
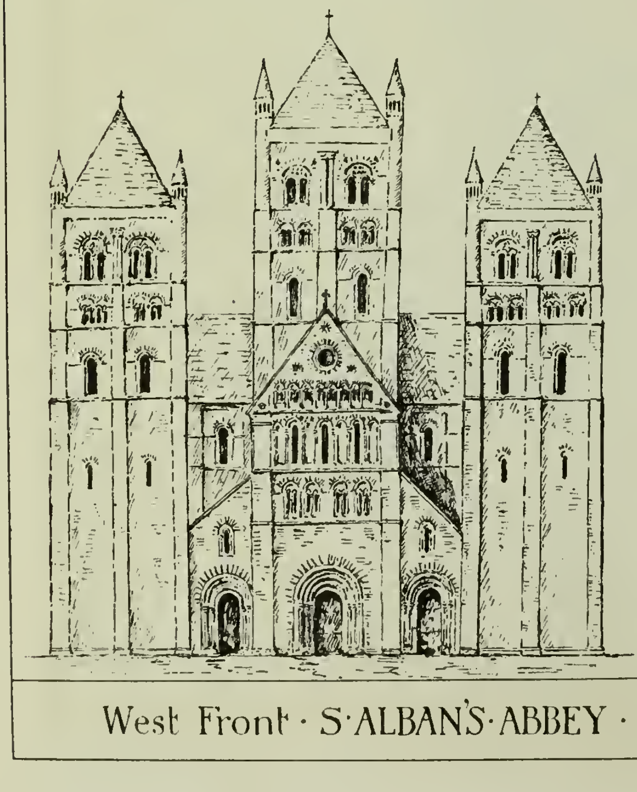
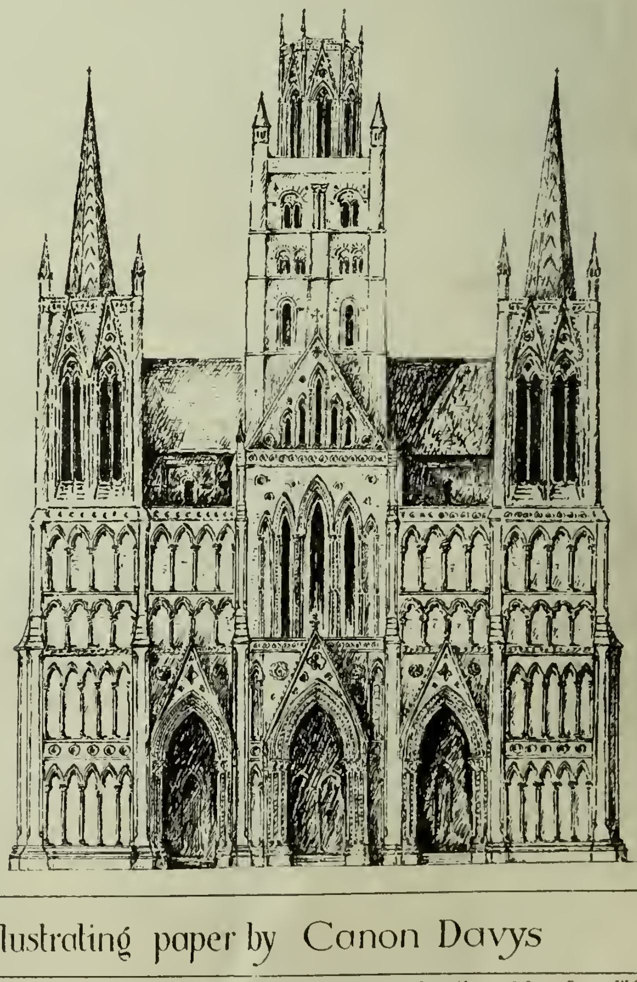
CADBURY HOUSE SOMERSET *Thomas Drew R·H·A· Architect*











West Front · S·ALBAN'S·ABBEY · illustrating paper by Canon Davys

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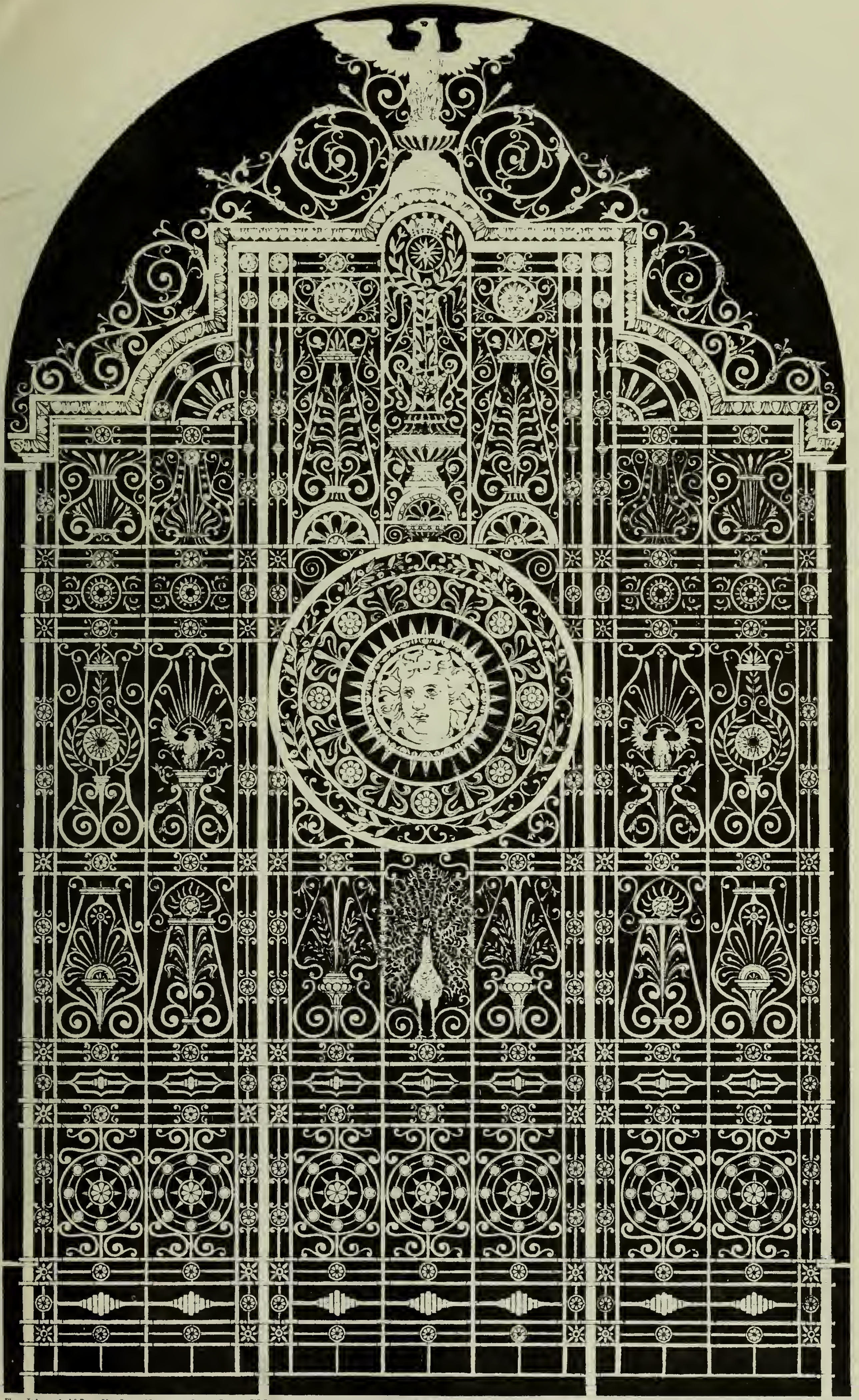
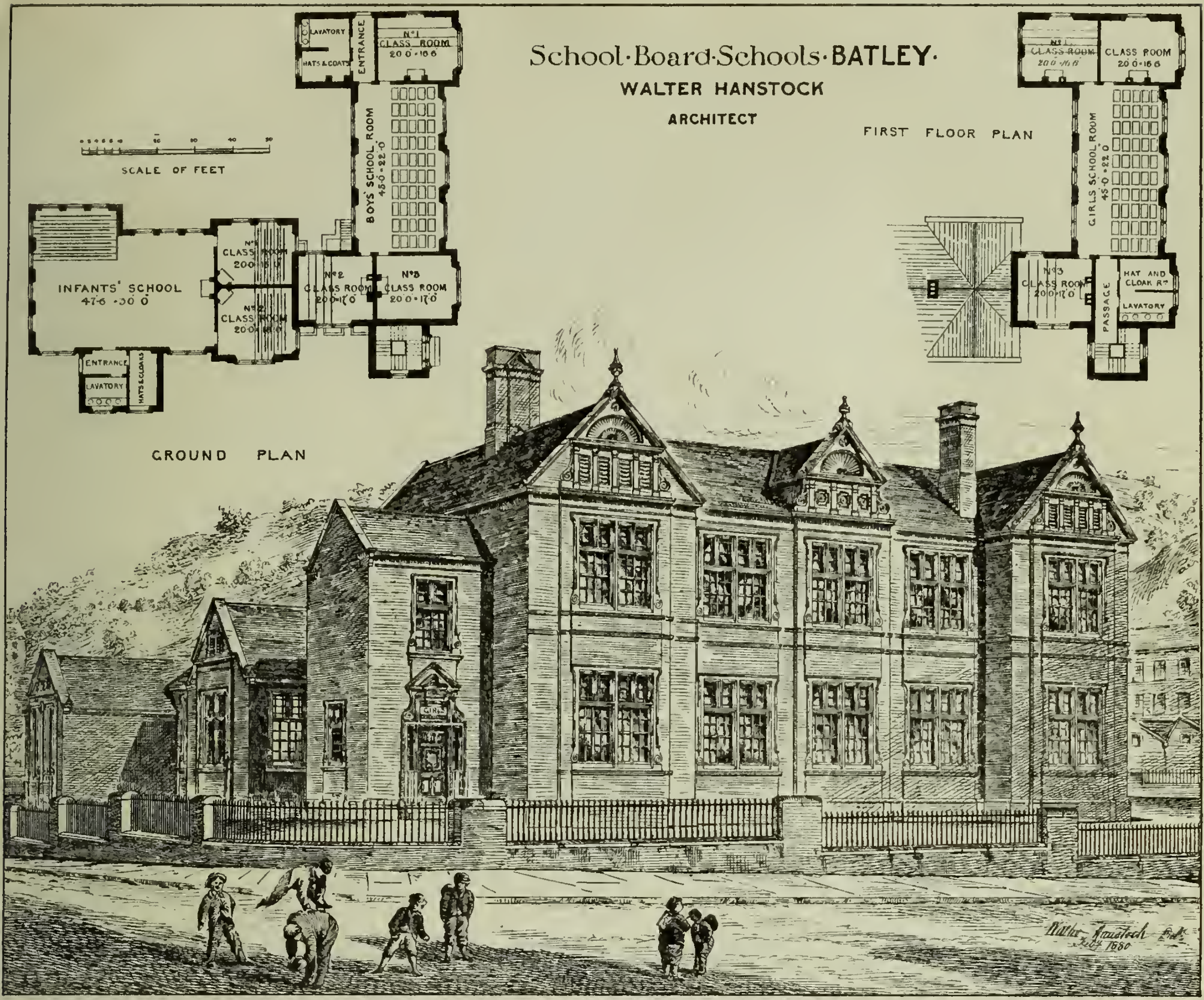


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C

IRON SCREEN
DESIGNED BY WALTER LANE
65 COW CROSS ST E C
MARCH 1ST
1880

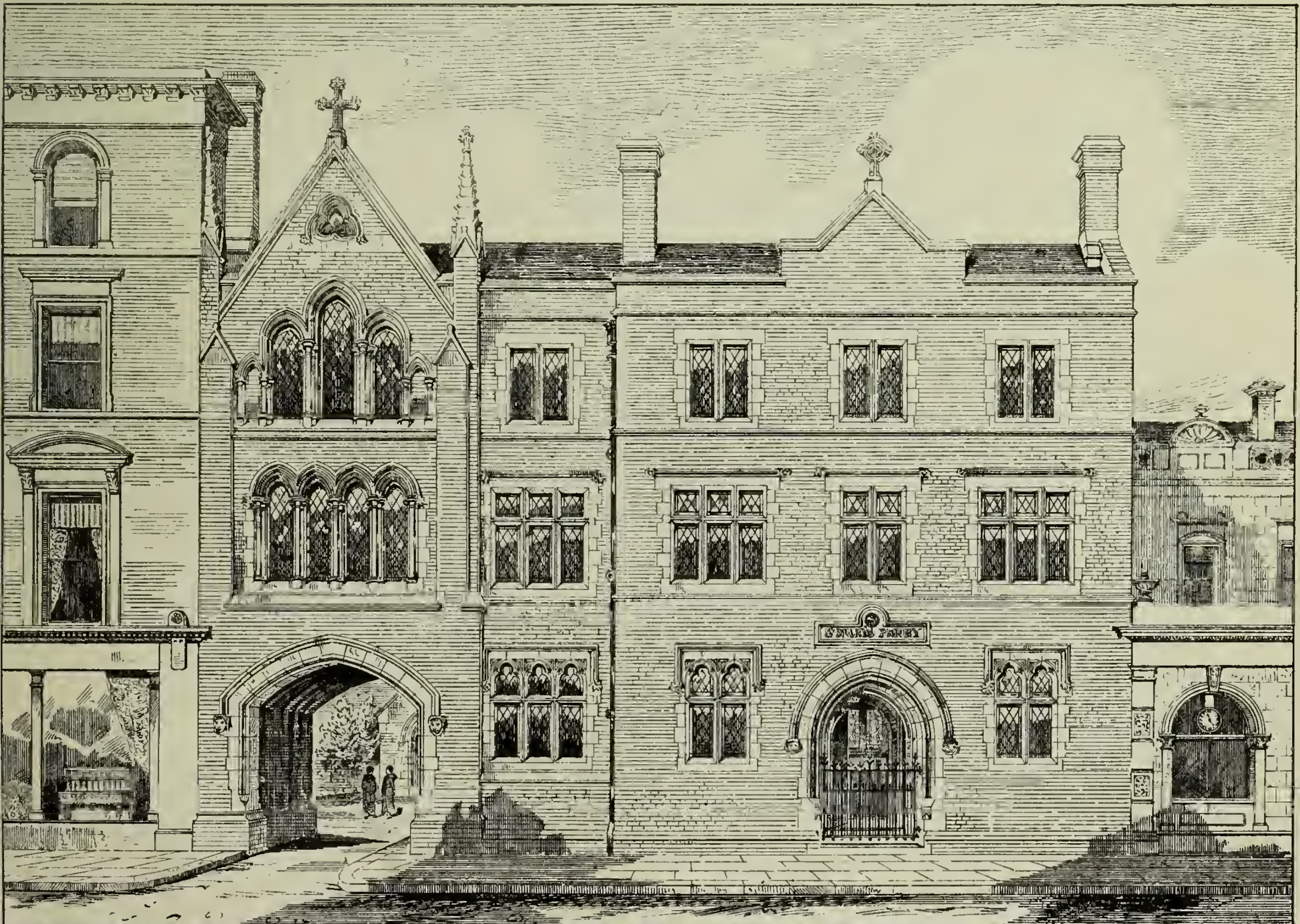


School·Board·Schools·BATLEY·

WALTER HANSTOCK

ARCHITECT

SCALE OF FEET
GROUND PLAN
FIRST FLOOR PLAN
INFANTS' SCHOOL 47·6 × 30·0
CLASS ROOM 20·0 × 16·6
BOYS' SCHOOL ROOM 45·0 × 22·0
Nº1 CLASS ROOM 20·0 × 16·6
Nº2 CLASS ROOM 20·0 × 17·0
Nº3 CLASS ROOM 20·0 × 17·0
GIRLS SCHOOL ROOM 45·0 × 22·0
HAT AND CLOAK Rᴹ
PASSAGE
LAVATORY
HATS & COATS
HATS & CLOAKS
ENTRANCE
GIRLS
Walter Hanstock Del.
Feby 1880



St Mary's Priory, Fulham Road, West Brompton — Messrs J. A. Hansom & Son Architects.

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

COLOGNE CATHEDRAL.

THE completion of the Cathedral of Cologne was celebrated on Friday last by a grand ceremony, in which the Emperor and Empress of Germany took a leading part. So much has been written during the past week about the building, its strange history and vicissitudes, that we need do little more than refer our readers to an article on the cathedral published in the Builing News for April 12, 1878, and indicate the outlines of its progress. More than 632 years have elapsed since the foundation-stone was laid of the cathedral now but completed in the rough, on the site of an older Basilican structure. The architect's name can only be conjectured from casual references to the building in contemporary chronicles. The present current of opinion sets in favour of ascribing the credit to one Gerard Von Riehl, as, in a document of 1257, it is stated: "Magister Gerardus lapicida rector fabricæ ecclesiæ majoris." The story of erection seems, from the first, to have been one of a spasmodic, but when resolved upon, systematic, begging for funds throughout Europe; a fitful execution of repairs that little more than counterbalanced the natural decay of the fabric, followed by alternating periods of neglect and restoration. How the choir was consecrated in 1322; how, for a few years, progress was made with the foundations of nave and west front; how, 115 years after the opening of the choir, the bells were raised to the south-west tower; how at the beginning of the 16th century, just after the insertion of painted glass in the north aisle of the nave, the wave of the Reformation swept over Germany, diverting attention from the Cathedral at Cologne for three centuries; and how, in the second quarter of the current century, the work of building was taken up as a matter of national, rather than religious pride and duty, and carried forward with increasing energy to its completion; all this has been told ofttimes and well. The superintending architects ("Dombaumeisters") since the re-commencement of the works in 1823, have been Alhert, who acted on the reports of Schinkel; Ernst Zwirner, who succeeded at Alhert's death in 1833; and more recently Voigtel, The outlay from 1842, when the Dombauverein, or association for the restoration and completion of the Cathedral, was established to the end of 1878, was £380,000, and from 1822 to the present time about half a million pounds sterling have been expended. The works of the past two or three years have been restricted to the raising of the twin stone spires on the western towers, and the redressing of the entire masonry in the southern tower, erected during the 14th century. In the first story of this tower, a great clock, by Mannhardt, of Munich, has been placed, and within it are hung a peal of five bells, of which the largest, the "Emperor" bell, cast from cannon taken during the Franco-Prussian war, weighs twenty-five tons. The ceremony performed last Friday included in its essentials a procession, in which were represented the workmen in the costumes of the different periods during the whole six and a third centuries through which the building has been in course of erection; followed by the affixing in the Dom Platz of the signatures of the Emperor and Empress and all the Federal princes and dignitaries of the Empire to a deed, which was then drawn up by machinery to the top of the southern spire, and inclosed within the capstone. The chief architect, Herr Voigtel, and the President of the Dombauverein are reported to have made long speeches in reply to the congratulations of the Emperor. In conception, Cologne Cathedral marks an early period of the Gothic style; only a score of years later than Salisbury, it shows a considerably more advanced stage of architecture. A writer in the *Times*, after claiming for this building that it has done more than any other to sustain the character of that style throughout the times of the Palladian revival, and to bring about the change back to the Gothic style, criticises its weak points in words that justify quotation:—The proportions seem rather mathematic than really æsthetic. The towers—over five hundred feet—are as high as the cathedral is long, which is not long enough for either internal or external effect. The external height of the roof is about equal to the width of the transepts—that is, more than 230ft. The internal height of the building is over 160ft., which is twice the usual internal height of our first-class cathedrals, and 60ft. higher than the highest part of the interior of Westminster Abbey. Yet at Cologne the width of the nave and choir, without the aisles, is very little over 40ft., and in that immense interior there is positively no space clear of pillars larger than a square of 40ft. The extra width, therefore, is obtained by double aisles, and the result is a forest of tall pillars. Tourists with a quarter of an hour to utilise generally spend most of it in trying to see the roof, and make out some bosses of special beauty and interest; but the mere distance of that vaulting from the eye interferes with its effect as a vista stretching before the spectator, as well as above him. But there are graver faults even than these, or even than the dumpy and crowded effect of the exterior. The design wants originality. It wants free, inventive, and creative grace. It is an endless repetition of the same identical forms—the same pillars, the same windows, the same niches, the same mouldings, the same pinnacles, the same ornamental features. When you have seen a part you have seen all—that is, so far as the details are concerned. This seems to reduce the edifice to an enormous exaggeration and multiplication—a mere feat of ambitious arithmetic, instead of a work of true art.

ARCHITECTURAL PHOTOGRAPHS FROM NORFOLK.

A COLLECTION of photographs is now on view at the Royal Architectural Museum, representing every building (with one or two exceptions) visited by the Architectural Association during their recent excursion in Norfolk,[*] while of the larger and more important buildings several illustrations are given; thus exemplifying almost all the peculiar characteristics of the architecture of Norwich and its neighbourhood.

The photographer was Mr. John L. Robinson, architect, of Dublin, who has placed his negatives in the hands of a firm of professional photographers in Dublin, who have agreed to supply members of the Association and their friends at cheap rates. As we have already described more or less at length most of the buildings here represented, we can only now allude to some few of the points of interest specially shown by the more important photographs on view at Westminster, as typical of the rest. The series, fully numbered and named, is mounted on twelve large sheets of cardboard, and starts with several views at Norwich, concluding with some fine pictures from Ely and Peterborough, in which places Mr. Robinson continued his holiday.

Sheet No. 1 includes a good S. view almost in elevation of the cathedral, which gives the spire to the best advantage. A large interior of the nave from a scaffolding half-way up the triforium arcade level, presents an unusually vast and unbroken view, chiefly secured by the fact that the choir and apse are seen from this height above the ugly organ and its massive screen, which, from more usual points of view, quite block out all beyond the crossing. The water-gate and three other gateways to the Cathedral Close and Bishop's Palace Grounds figure here and furnish good examples of cut flint work. The specimen, however, over the north Close entrance from Tombland, the Ethelbert-gate, is quite a comparatively recent restoration. The sheet also includes a group of the excursionists taken at North Walsham. A fine bright view from the cloisters shows the spire on the angle, and the hitherto unshown Lady-chapel entrance with late restorations, are illustrated with a view from the organ-screen of the choir. The Guildhall door, which was really taken not long since from an old house in London-street, now demolished, figures also on sheet No. 2, with the much-debated ruin in the Palace garden, said to have served as a halting-place for processions, a purpose for which there seems to be but little authority. A nice view of the well-served Church of St. John, Maddermarket, with a good detail of one of its side screens, curious for having an entrance on either side, figures next a view of the badly-restored and hideously-stalled chancel of St. Lawrence, with its gimcrack modern screens. A somewhat distorted photograph comically represents the excursionists at Trunch on sheet No. 3, and here are seen views of St. Andrew's Hall, Norwich, both inside and out, with some back-street views showing the typical Norwich dormers, as in Ber-street, or the view up a hill looking at the prominent tower of St. Giles's. Worstead, Attleborough, and Cawston form three fine interiors side by side, the comparison increasing, if possible, the beauty of the magnificent roof of the last-named building. The fine rood-screen crammed against the west wall of Attleborough church remains as an example of the vandalism of some of the clergy. The fonts at Knapton (now unused to make way for a slop-basin), Trunch, Salle, East Dereham, Cawston, and Worstead are here ably photographed with some uncommonly fine details in three sheets of the stalls at Trunch. The sedilia, or, as some call it, altar-tomb, at Wymondham, seems of similar character, though later date, to this "baptistery," and bears some considerable likeness to a tomb in one of the Norwich churches. Of tombs, the principal one is the large altar tomb of Lord Morley, who died in 1435 at Hingham, and it well deserves a place, though unfortunately the photograph here hardly does it justice. In screens, several photographs, as might be expected, are rich, specially those at Trunch, Worstead (west end), Attleborough (already referred to), Edingthorpe, and Knapton. No. 6 gives a sheet of entrances and south porches, headed by the fine specimens of flint-work from Worstead and Aylsham, and N. porch example at Wymondham, which is entirely of stone, hereabouts unusual. The lychgate from Aylsham, and the elaborate doors, with traceried detail, from Deopham, should be secured in making a selection. Walsingham and Bromholm Priory are carefully and well-represented by views 46, 48, 49, 50, J, 51, 52, and 53, all of which should be chosen, especially that of the gateway at Walsingham, the last-named. Some fine carvings in the way of gurgoyles are here seen, and also the peeping heads. The staircase to the refectory at Walsingham is also shown. The Chapel of Houghton-in-the-Dale is a very interesting photograph. East Barsham Hall is illustrated not less fully than it deserves to be by views, numbered 54, 56, 57, K, and 58. The general view K is a very good photograph. Sheet No. 9 is devoted to a series of interiors, all of interest, and a set of exterior views are arranged on sheet No. 10. These latter include Salle, with its open belfry and ringing-stage piercing; East Dereham, Deopham, Attleborough, Knapton, and Edingthorpe, all of which are well worth having, for more reasons than one. With this sheet the excursion series of photographs concludes. Sheets 11 and 12 are devoted to Peterborough and Ely. Of the former, an entirely fresh view of the west front is obtained by photo Ka, while L and O furnish fine details. The first-named shows the cathedral from the cloister garth; and the last-named gives a piece of the cloisters with the well-known gateway. Two views of the interior and porch complete the sheet, and the Market-house at Peterborough is quaintly shown on the next series of views, where also some fine wrought-iron work in the palace garden is given. Of Ely, a good interior shows Mr. Gambier Parry's ceiling to the nave, and several nice bits from the exterior. These photographs will remain on view at the Royal Architectural Museum during the week, and will be exhibited at the A.A. *conversazione* on Friday next.

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[*] See Building News, Aug. 13, 20, and 27, 1880.

A "SPIRIT FRESCO" PAINTING.

WE have seen a fresco painting which Mr. Philip Harry Newman, of Ampthill-square, has just completed on the south wall of the chancel of St. Peter's Church, Belsize-square. The subject represented by the artist is Christ healing the Sick, and is apparently suggested by the verse in St. Luke vi. ch., 19th verse, describing the multitude who sought to touch him. Our Lord stands in the centre of a pressing, anxious group of sick, halt, and blind, and is holding his hand over a woman with an infant in her outstretched arms, who is on her knees before him. Behind her is a sick man lying on a bed, over whom a woman is tenderly watching, while on the extreme left is a blind man being led forward by a boy. Equally touching are the figures behind the Saviour. Here we have a woman on her knees leaning forward on one hand, and with the other she is reverently holding up the hem of Christ's robe, and to the right hand another figure is holding out her arms. In the background are other figures of the Disciples. In composition and grouping the picture is a success; the figures are well balanced: to pick holes we might be disposed to find fault with some of them. There is, perhaps, a want of distinctness, or relief of light and shadow and gradation here and there, though every allowance has to be made for the artist who has to produce his effect under a side light of a richly-tinted and imperfect kind. The east window, filled with stained-glass subjects, is the nearest light available, and Mr. Newman has has had to contend with the bright luminous colouring of the glass, so often fatal to interior wall paintings. The colouring of the fresco is consequently in high-light tones, and is best seen in the morning.

As a recent instance of the use of Mr. Gambier Parry's new "spirit fresco" process, recently described in the Building News (see Vol. XXXIX., p. 92), this fresco has more than ordinary interest to the artist. Mr. Parry claims the following among other advantages of the process: durability; power to resist damp and change of temperature; luminous effect; and a dead surface. Good common porous stucco is the material Mr. Newman has had to work upon, and it must be acknowledged that, in spite of conditions not favourable to pictorial effect, his work speaks well for the process, and the handling is thoroughly decorative. The chancel walls and roof are richly coloured, bands of stencil patterns occupying the space between the fresco and the choir-seating, and on the north side painted figures occur in the spandrels. The spaces between the rafters are also relieved by bright colours, which have tended to impair the effect of a fresco painting. Round the picture, which is 15ft. by 8ft. high, is a border of gold, enriched by a pattern. Those who are anxious to see the effect of the "spirit fresco" mode of painting so highly recommended by Sir F. Leighton, P.R.A., who has recently adopted it in the large new lunette at South Kensington, cannot do better than examine the luminous and highly-creditable decorative fresco Mr. Newman has just completed in St. Peter's Church.

MEETING OF METROPOLITAN BRICKMAKERS.

THE brick manufacturers supplying the Metropolitan districts having no organised association, a meeting of the chief makers is convened about Michaelmas in each year at the Malt and Hop Exchange in Southwark-street, to talk over matters affecting the trade. That for 1880 took place yesterday (Thursday), three weeks later than usual, when Mr. Wragge (of Messrs. Eastwood and Co.) was called to the chair. About a hundred persons were present. The chairman said the seasons of 1878 and 1879 had been very unfortunate, not only on account of the rains which penetrated brick, but also because of the depression in trade, so that both supply and demand were simultaneously reduced. There seemed, however, to have been a general improvement this year: in the early months the weather was exceedingly fine, the moulders did good work, and the output turned out was, he estimated from all accounts he had heard, equal to a 20 per cent. increase on 1879, equivalent to 120 million more bricks in the districts supplying London. The rains, however, of the past few weeks had been generally calamitous, and would occasion loss to those who went on making till late in the season. While there was every prospect that the good harvest would give trade a fillip next spring, there seemed little doubt that wages must be reduced. Mr. William Richardson thought the increased output of this over last year had been overestimated; he believed it was only about 10 per cent. His own firm had made 22 in place of 17 millions, and had lost about two millions of bricks by the recent rains. Letters were read from makers in two districts of Kent, speaking of the great damage caused by the recent rains, which was corroborated by Messrs. Minter (Tilsley's and Minter, of Cowley), Axton, Smeed, and others, while Mr. Stroud said his firm had escaped, having ceased making early. It was generally considered there would be many "shuffs" found as the result of the sudden change of weather. Stocks which were at the lowest last spring were rather heavy till they were thus reduced. As to prices, Mr. Richardson had known bricks sold from the river at 27s. per thousand, a price which could not pay interest on capital. Several makers said they had lately sold at 28s. and 29s., but it was agreed that the price to be remunerative should not range below from 28s. 6d. to 31s., and as stocks were now lowered, Mr. Minter said they had only to be firm to obtain fair prices. An animated conversation took place as to the wages, the unanimous feeling being that they are now higher than can be afforded. It appeared that in the Shepherd's Bush, and North-West Metropolitan districts, the wages, which are now 5s. 6d. per thousand, are on the point of being lowered by 9d., and so *pro rata* through the trade; that in the Cowley district there will be an effort to reduce from 4s. 8d. per thousand to 4s.; that in the Sittingbourne district a similar reduction will be offered; that in South Essex 8d. was proposed by the masters on an average of 5s., and 6d. accepted by the men; and the reduction on the mould would be almost uniformly 6d. per thousand. It having been agreed to hold a similar meeting next year, a vote of thanks to the chairman closed the hour's proceedings.

SUGGESTIONS FOR CREOSOTING TIMBER.

THE value of creosoting timber is attested by Mr. Putnam, an Associate of the American Society of Civil Engineers, who plainly says timber saturated with coal-tar oil is practically indestructible, and as durable as iron or stone, and this statement he verifies by actual observation. He placed pieces of timber treated with coal-tar oil in water, where the *Teredo Navalis* abounded, and he found that while the worms entered the untreated portions, the creosoted parts were untouched by them. The teredo would attack and destroy the parts not saturated with the oil; but wherever it came in contact with the creosoted parts it turned away. The bottoms of boats may be protected by the application of creosote, and piles properly done have stood 30 and 40 years, and are still good. One or two useful suggestions are made for the selection of timber to be treated. Mr. Putnam says, in effect, that the rules adopted by engineers in selecting timber should be set aside in the use of creosoted timber. Compact solid-heart timber, such as would be selected for durability, is clearly not the best kind to saturate. "The soft and unripened growth or sapwood more readily absorbs oil, and becomes the more durable. I am satisfied," says the author, "that the more porous and destructible classes of timber now considered nearly worthless will, when creosoted, become the most valuable. Fir, swamp-ash, old field pine, when treated, will outlast the best white oak, yellow pine, or cedar uncreosoted." The architect or engineer who has to prepare specifications for creosoted timber, ought to take a hint from this new doctrine. However untenable the advice appears, there is some foundation in the statement; to confirm which the author mentions the fact that he has in his possession pieces of yellow pine, the sap-wood of which was partly saturated with creosote oil in 1872, and which had been exposed to the earth. Where the sapwood was treated, it is perfectly sound, but the part left untreated and a portion of the heart-wood are entirely rotten. If the facts we have mentioned are verifiable, it will lead to an important change in the use of the lighter varieties of timber we have named, especially for engineering purposes. A more obvious suggestion is that the cutting and framing of timber should be done before treatment, though this is not always possible.

The author proceeds to describe the method adopted to treat timber at West Pascagoula, Miss., for bridge-construction. The main features of this process may be described to be the extraction of the sap in the timber by the application of steam, which vaporises and condenses the moisture, after which the tank is filled with oil, and a pressure applied by a pump of from 150 to 200 pounds per square inch. To assist in expelling the moisture super-heated steam is passed through coils of small pipe in the tank.

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Extensive additions and alterations are about to be made to the Congregational chapel at Stubbiu, near Sheffield, from the plans of Messrs. Junocent and Brown, of Sheffield.

At the Staffordshire Court of Quarter Sessions, on Monday, a vote of £35,000 was granted for enlarging the county pauper lunatic asylum at Stafford.

COMPETITIONS.

Glasgow.—The Proposed Municipal Buildings.—On Thursday week a special meeting of the Glasgow Town Council was held to consider the report by Mr. Charles Barry, London, on the competitive designs for the new municipal buildings. Lord Provost Collins moved "that it be remitted to the Municipal Buildings Committee to consider the several designs lodged in competition, and to report whether any, and if so, what designs are specially worthy of the consideration of the Council, and express such opinion thereon as they consider expedient, with power to take such professional assistance as the committee may consider to be necessary." He said that if that motion was adopted it would commit the Council to nothing, as it kept the matter open for the new Council. Mr. Osborne seconded. Mr. Mathieson thought it was of no use remitting the matter to the committee again, until the disputed points in connection with it were settled, and he moved as an amendment—"That Mr. Barry's report lie on the table for consideration by the Council meeting in December, and that we do not make any remit to the Municipal Buildings Committee." Bailie Scott seconded. Mr. W. R. W. Smith supported the amendment. Treasurer Hamilton suggested a method on which a new competition might be carried out. Mr. Jackson, Mr. Shaw, Bailie Colqubonn, and Bailie Finlay supported the amendment. After further discussion the Lord Provost offered to withdraw his motion. A discussion arose on the point whether it had been declared that no decision should be arrived at by the present meeting. The Clerk said that was the understanding. Mr. Smith, seconded by Mr. Young, moved the adjournment of the debate, and on a vote being taken 15 voted for the adjournment and 25 to go on, the Lord Provost declining to vote. Messrs. Smith and Mathieson protested. Calls were then made for the vote to be taken between the motion and amendment, and further discussion took place as to whether a decision should be come to. The vote was taken as between the original motion and amendment, Mr. Mathieson and Mr. Smith stating that as they had protested they would not vote; and Mr. Mathieson desiring his supporters also to decline to vote. On the roll having been called, the result was declared as follows:—For the motion, 25; for the amendment, 0; declined to vote, 16. Mr. Smith and Mr. Mathieson protested against the whole proceedings, but ultimately the motion was declared carried.

Waterford.—In an open competition among architects the design of Mr. Walter G. Doolin, architect, of Dublin, has been selected for the Waterford City Markets. There were thirteen competitors. The site presents, nevertheless, some difficulties, owing to irregularity both of boundary and surface. By the introduction of the range of shops or stalls in Peter-street, and the ring of stalls round Market-hall, roofed at a different level from the main roof of the Market-hall, many difficulties in dealing with the main roof are avoided. The site is inclosed on four sides by stalls opening on a central hall, or covered hall, size 74ft. by 143ft., divided into bays, which also mark the spaces for the ordinary open stalls by the columns supporting the main roof, which is in five spans. The stalls surrounding the Market hall will be of the nature of shops. The author has made the Market-hall as lofty as seemed desirable. Ventilation is secured by the louvred lantern extending the whole length of each span of roof. It is intended to face the exterior of stalls of brickwork—Youghal and English brickes mixed, using Waterford bricks on the inside of wall. All internal division walls to be of concrete, as also the open stalls and floor of Market-hall. No limit of cost was laid down in the instructions to competitors.—The same architect's designs for the new church of St. Carthagh, Lismore, Waterford Co. have also been selected. The church will cost about £8,000, and the works will be proceeded with immediately. A simple elevation has been chosen for the exterior of Romanesque character.

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The town council of Beccles have adopted a report by the sewage committee recommending that the plans of Mr. T. Miller, C.E., of Ipswich, be adopted for the utilisation of the town sewage, and that 45 acres of the Corporation land near Puttock-hill be granted for that purpose.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Glasgow Institute of Architects.—The thirteenth annual meeting of this Institute was held on Tuesday—Mr. Campbell Douglas, the president, in the chair. The distribution of prizes took place. The competition had been open to draughtsmen and pupils in the office of members of the Institute, and the president handed the rewards to the successful competitors. The annual report and treasurer's statement were approved of. The council of management for the year was chosen, consisting of—Messrs. Campbell Douglas, John Honeyman, R. A. Bryden, William Landless, Hugh Barclay, T. L. Watson, Hugh H. M'Lure, James Sellars, jun., Robert Turnbull, and James Thomson. A meeting of the newly-elected council took place immediately after the general meeting of the Institute. Mr. John Honeyman was elected president; Mr. James Sellars, jun., vice-president; Mr. John Burnet, auditor; Mr. William Landless, treasurer; Mr. William MacLean, secretary. In the report, it is stated that the Institute members on the register number 46. Two members of the Institute died during the year, viz.—Mr. Matthew Forsyth, a member of council, and Mr. James Carmichael. Mr. Hugh H. M'Lure was chosen in room of Mr. Forsyth as a member of council. No new members were admitted during the past year, and the council earnestly trust that the members will do all that lies in their power towards extending the membership of the Institute. Mr. John Burnet, and Mr. Jas. Thomson (the late president) were appointed trustees of Haldane's Academy of the Fine Arts for 1880-81. It has been resolved not to award the Institute gold medal offered this year for the best design for a town residence, as only one set of drawings were submitted, viz., by D. B. Burnie, in the office of Messrs. Baird and Thomson. However, it has been agreed to award three guineas in recognition of the meritorious character of these drawings. The Council regret that their invitation did not meet with a heartier response. With regard to the president's prize, the Council commended the whole of the drawings sent in, and it was only after careful consideration that they were able to arrive at their decision, and award the prize to Mr. Alfred J. Brown, in Mr. J. L. Cowan's office. The book given was Mr. Stevenson's work on "House Architecture." The council, as trustees of the "Alexander Thomson Memorial," have held no meeting since their last report. The funds then amounted to £523 19s. 3d., after defraying the cost of the bust of the late Mr. Thomson, presented to the city authorities, and placed in the Corporation Galleries. A committee, of which Mr. John Shields is convener, was appointed for raising further subscriptions; and it was agreed to delay holding the first competition till the funds are in a more satisfactory state. It was, therefore, peculiarly gratifying to the trustees to receive early this year an intimation from the trustees of Haldane's Academy of the Fine Arts, that they had "agreed to contribute £50 to aid in establishing the Alexander Thomson Travelling Art Studentship."

Royal Archæological Association of Ireland.—A meeting of this Association was held at Cork, on Saturday, Mr. J. Bennett in the chair. Dr. Caulfield exhibited a stone celt 12in. in length, which, with eleven others, had been found along with rubbish and copper ore in a cave at Ballyrirard-hill, West Carbery, County Cork. The discovery pointed to mining operations carried on during the stone age, and was probably the last link between the stone and bronze periods. On the hill-side ten or twelve parallel lodes of copper had, since 1854, been known to exist on Ballyrirard-hill, but although a company was once started to work the mines, they still remain neglected.—The Rev. Canon Hayman read a paper on "Knightly Effigies," which, although common on monuments in England, were very rare in Ireland, the only known examples being restricted to the counties of Dublin, Kerry, Cork, Kildare, Kilkenny, Roscommon, and Tipperary. He also exhibited a stone relic, found about 18in. below the surface, at Ballynoe, by Mr. Fitzgerald, clerk of works at Lismore Castle. It was hollow at both ends, and was believed to have been used in some sort of game, as with the only other known example were found some stone balls which fitted into the hollow at either end.—Mr. W. Ringrose Atkins exhibited a rubbing of a marble tombstone which he had lately discovered in the crypt of Christ Church, Cork; it was of the Elizabethan period, and was elaborately decorated, but much mutilated.—Mr. Robert Day, F.S.A., exhibited a bronze seal of the 16th century, found at Mullingar, and bearing the inscription "signum comune de Mollingar," enclosing a representation of a water-wheel and tearing-hackle, and a rude view of the town, with embattled tower, church spire, and a tented field.

Building Intelligence.

Bushey.—On Tuesday week, the Bishop of St. Albans consecrated the new church of St. Matthew, Oxhey, which is intended to meet the growing spiritual needs of part of Bushey parish and South Watford, and of which the Rev. Newton Price is the first vicar. The church, which is designed to accommodate nearly 500 persons, is cruciform in plan. It consists of an apsidal chancel, having north transept as organ chamber and south transept as vestry; a four-bayed nave with aisles, clereston, tower, and spire; entrance at the north-west angle. Internally, the building measures 104ft. in length by 52ft. across the nave and aisles. In style the architecture belongs to the Early English period, and has been carried out chiefly in brickwork. The exterior is of red brick, having darker bands of a purple hue. The octagonal spire, also of red brick, is now in course of erection. The eastern window is enriched with stained glass illustrating Christ as the Good Shepherd, executed by Messrs. Heaton, Butler, and Bayne, and the gift of the architect. The work has been carried out by Messrs. G. and I. Waterman from the design and under the superintendence of Mr. W. H. Syme, A.R.I.B.A., architect, Watford; Messrs. Tidcombe and Son have carried out the heating apparatus; Mr. Coney the mason's work; and Mr. Pitkin is clerk of the works.

City of London School. — The foundation-stone of the new buildings of this school was laid last week. The site has a frontage of 136ft. on the Victoria Embankment, and is in extent about one acre and a half: 53 architects responded to the invitation of the Corporation to submit plans for a new school, and that of Messrs. Davis and Emanuel was selected. The building is to be in the Italian Renaissance style, the front entirely of stone, with a wing extending along the street which is to be constructed from Tudor-street to the Thames Embankment. The main portion will be three stories high, a covered playground with the necessary offices and administration rooms occupying the ground floor. On the first floor of the front building will be a large hall, 100ft. long by 45ft. wide, while the class rooms will be placed in the wing. The estimated cost is £55,000, but at present a contract has not been drawn up with any firm. By the change of site an open and a covered playground will be provided. The school will afford accommodation for 680 boys. For some months past Mr. Seward, agent to Messrs. Higgs and Hill, has had a large number of men at work excavating the ground and filling in the foundations with concrete to a depth of from 18 to 22ft; all this having been done under the immediate supervision of Mr. W. J. Allen, the architects' clerk of the works.

Frant.—The parish-church of Frant, Sussex, has been reopened after restoration. Outside the roof has been new leaded, repointed, and other repairs made. Into all the windows, with the exception of that over the Marquess of Abergavenny's pew, and in the chancel, fresh glass has been put, which has lately been found in some lofts and stables in close proximity to the church. The glass is of English make, and dates from the 13th to 16th centuries. The church has been redecorated in keeping with the period of its building. The decorations are from drawings by Mr. John O. Scott, and have been carried out by Mr. Milner Allen, of Fulham, London. The work has cost £1,100.

Glasgow.—The Theatre Royal, in Hope-street, rebuilt from the designs and under the superintendence of Mr. C. J. Phipps, F.S.A., of London, will be opened on Tuesday next. All the floors and passages are of fire-proof concrete, while the inner walls are of brick and Portland cement. The new theatre will accommodate in all 2,758 persons, of whom 1,000 will be seated in the pit, 312 in the dress circle, 300 in the upper circle, 366 in the amphitheatre, and the remainder in private boxes and a gallery 16 rows in depth. The general dimensions are: curtain line to dress-circle front 40ft., to upper-circle front 48ft., to amphitheatre-front 50ft., to gallery-front 59ft., to back wall of pit $68\frac{1}{2}$ft.; width of stage 72ft., height of stage to gridiron floor 60ft., and depth to cellars 20ft.; the ceiling is 61ft. above pit, and the proscenium opening is 31ft. wide and 36ft. high. The stage has been constructed by Mr. Owen, of London; and on the Hope-street front are the windows lighting the dressing-rooms. The internal decorations and fittings are French Renaissance in character. The roof terminates in a coved ceiling having a sun burner in the centre. On either side of the proscenium opening are the private boxes, which are inclosed by moulded and fluted columns having enriched caps. Over the proscenium is an allegorial figure-subject representing the various arts allied to the drama, painted by Harford, of London. The ceiling has a ground of a light cream colour, on which are painted in eight panels elaborate ornaments in gold and colours, and the cornice below the ceiling is richly moulded and gilded. The cream colour of decorations is darkened as the lower parts of the auditorium are approached. The walls of this auditorium are covered with crimson paper, while those of the private boxes will be of sage green and gold with crimson curtains. The painted decorations and gildings are being executed by Mr. E. Bell, of London, and Messrs. Jackson and Sons, of London, have constructed the box fronts, proscenium, and ceiling in their patent fibrous plaster. The vestibule is laid with marble mosaic by Messrs. Burke and Salviati, of London and Venice. The stalls and dress circle are fitted with folding chairs invented by the architect and made by Mr. Wadmans, of Bath. The constructive portions of the building have been executed by the following contractors, all of Glasgow:—Messrs. Stevenson and Son, masons and bricklayers; Messrs. Ross and Son, carpenters and joiners; Messrs. Morrison and Son, concrete builders and fitters; Messrs. M'Gregor, Gilmour and Co., and Stevens, ironwork; Mr. Bremner, plasterer; Mr. Rac, plumber; and Messrs. Chalmers and Tosh, gas-fitters. The theatre has been rebuilt in eight months, Mr. William Browne acting as inspector of works.

Wakefield.—On Monday, at Wakefield, the Mayor formally opened the buildings which have been provided as the Town Hall and municipal buildings for the borough. Early in the spring of 1877 the Corporation decided to erect a Town Hall, and they offered £300 in three prizes for the best three sets of designs. About 40 architects took part in the competition, and ultimately the Corporation, acting under the advice of Mr. G. E. Street, R.A., decided to adopt the plans of Mr. T. E. Collcutt, of London. There is still much to be done in connection with the internal fittings and furnishing of the new premises; but as Monday was the third anniversary of the laying of the foundation-stone, it was determined that the opening ceremony should take place on that day. The building, the accepted design for which was illustrated by a perspective in the Building News, is in the Renaissance style, with a lofty square tower, in which a clock has been inserted, supplied by Messrs. Potts and Sons, of Leeds. The buildings, which occupy 2,041 square yards, have been built of stone from the Spinkwell Quarries, near Bradford. The block extends from Wood-street to King-street at the rear, and there are narrow streets on each side. The buildings, which have cost about £70,000 (in addition to £10,000 for the new police buildings), stand on high ground, and the clock-tower is one of the most prominent features in Wakefield. The internal arrangements of the building are excellent, and the fittings and furnishings magnificent. The Borough Court is a fine room, and the Council Chamber and banqueting-hall are also noble apartments. The various works have been carried out by the following contractors:—Builders, Messrs. Holdsworth, Bradford, £43,700; plastering, Mr. Dixon, of Bradford (sub-contractor under Messrs. Holdsworth); clock for tower, Messrs. Potts and Sons, Leeds, £250.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Country Architect. (Write Batsford, 52, High Holborn, W.C.)

"BUILDING NEWS" DESIGNING CLUB.

WE begin to day a new series of subjects, and herewith publish the rules of competition:—

RULES OF COMPETITION.

1. Drawings to be sent in 28 days after the publication of the list of subjects.
2. Usually two subjects will be given every month, from which a competitor may choose.
3. The drawings to be executed in firm black lines on white drawing-paper, in sheets of the absolute size of 22in. by 14in., with no washes or tinting in colour watever. Outline to be the first consideration; but drawings may be slightly shaded with shadows executed wholly in line. Sectional parts to be shown in ruled "hatching," or blocked in. The scale to be used will be given with each subject.
4. Drawings to be forwarded unmounted, by post, care being taken to roll the short way of the drawing, as packages over 18in. long are not transmissible through the post.
5. On entering the class (which may be done at any time) each competitor is required to furnish his name and address, which must be written legibly on the back of each drawing, as a guarantee of good faith, the *nom de plume* the author intends to adopt being boldly marked on the front of each separate drawing.
6. Prizes of £10 10s., £5 5s., and £3 3s., will be awarded to the best series of designs, such series not to consist of less than twelve subjects. Our decision to be final.
7. Before awarding the prizes any contributor will be expected to furnish proof, if necessary, as to his age, and the time during which he has been engaged in professional pursuits, though no candidate need be strictly an architectural student.
8. We reserve the right of arranging the drawings for publication in any manner we deem necessary.
9. A critical notice of the designs sent in of each series will be given in an early issue following the receipt of the drawings.

LIST OF SUBJECTS.

A. An artist's studio, including a house for the residence of the artist. The studio to be 30ft. long by 19ft. wide, and 15ft. high, placed on the first floor, part of the height being obtained in the roof. The house to contain a drawing-room, dining-room, and 4 bedrooms, with the usual offices. Materials, brick and tile. Plans of each floor, one elevation and sketch, and a section. Scale, 8ft. to the inch.

B. An overmantel, 4ft. wide, finished at a dado-rail 7ft. from floor. Materials, deal, painted white and enriched with gold. Elevation and sketch, also details. Inch scale and large size details.

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Correspondence.

IRON IN PORTLAND CEMENT.

To the Editor of the Building News.

Sir,—I am much obliged to the "Writer of the Article" for the courteous manner in which he has noticed my former letter. I was in hopes also, that some of your correspondents who are well versed in the subject would have given us the benefit of their experience in your columns; but as this does not appear to be forthcoming, and having in my former letter fully stated my opinion, I think (so far as I am concerned) the correspondence may close.

I will, however, venture to restate the main points of my contention, which I think the letter of the "Writer of the Article," although excellent in its information, does not affect.

The position I took was essentially a practical one. I do not pretend to high scientific attainments like those evidently possessed by the "Writer of the Article," neither am I alarmed at the prospect of the future Portland cement being made without oxide of iron. I think I am too sincerely desirous of real progress, and have too much confidence in the good sense of my countrymen, to be "alarmed" at any proposed changes that are likely to be of real benefit. What I argued was, that the rejection of *all* materials containing oxide of iron was impracticable and unnecessary. In proof of the latter I will quote from a very eminent authority, who says—"Oxide of iron is found in almost all clays . . . .; it is *never*, however, present in such quantities as to materially interfere with the strength of the cement itself."

This is clear and definite.

The "Writer of the Article" advises me to study Portland cement from its chemical as well as its constructive points; but I should remind him that it is the latter that is of all importance, and if satisfied in its requirements (durability not overlooked) it matters little what may be the chemistry of the compound. The *practical* test in building operations is the true one, whether it accords with the theory or not. Architects do not ask whether the materials they use contain the exact amount of this or that ingredient, but whether they will do the work required of them. And this is precisely what I contended, viz.:—"that for all practical purposes cements containing oxide of iron were as good as any other," i.e., as good for the work required, which in the bulk of cases is simply to last as long as the materials with which they are associated; or, until the mutations of time have rendered obsolete the structure of which they form a part. That "iron" cements are abundantly equal to this task is matter of every-day experience.

The early decay of building stones containing iron which the "writer" brings forward as an argument that the same process will take place in cement, cannot, I think, be regarded as in any way a parallel case; and, on the other hand, I have in my own experience seen brickwork built with an "iron" Portland cement, (in water-tanks and other works in damp situations) which has stood for years, and yet has not shown the slightest indication of disintegration or decay.

Then as to the *impracticability* of rejecting impregnated materials. It appears to me that if cement free from iron is to be obtained, one of two things must take place: either the iron must be carefully eliminated from all materials now in use for the manufacture of cement, or cement must be manufactured from none but pure clays. Let us consider the latter alternative first. In the quotation before given it says, "Oxide of iron is found in almost all clays," and the "Writer" is probably aware of this. It is true that silica is one of the most abundant materials in nature, but it is also true that almost invariably it is found in combination with alumina, (which is also condemned by the "Writer") and oxide of iron. Only in flints and the celebrated fireclays can it be found to any great extent in a state of purity in this country. We see, then, that a pure silica is a rare material; but we must remember that something more is required for the manufacture of Portland cement, viz.:—Carbonate of lime, and it is also necessary that these two materials should be in somewhat close proximity. To illustrate this point I will venture to give another quotation from the same authority. He says: "On a site commanding carbonate of lime only, and remote from the clays or shales, involving thereby cost of carriage, works could not be carried on profitably." And much more so would this be the case if the carbonate of lime had to be conveyed to the silica. But, if cement is to be made only of pure clay one of these plans would have to be adopted. And it is easy to see that the result of this procedure would be most disastrous in an economical sense—raising the price of cement, curtailing the production, and rendering its use in country districts almost out of the question. Passing to the other alternative, viz., that of eliminating the iron from the raw materials, I will only say that it appears to me quite impracticable, and particularly so from the largely increased cost it would entail in the manufacture; resulting in the same disastrous consequences as the former alternative. What a revolution it would create in the great works along the Thames if the fiat went forth that all the clay going into the wash-mill must be free from iron! Of course if the "Writer" is prepared with a scheme for the economical accomplishment of the desired object, that might alter the state of affairs; but at present I can but conclude that the rejection of "iron" materials is both unnecessary and impracticable.

It is a maxim of political economy that the cheaper any article can be produced the more widely will its use be extended; and I think that to produce in every district where materials can be obtained a sound, useful cement, will be of greater advantage, than to aim at a perfection which is, to say the least of it, superfluous, and the effect of which would be to increase the cost, and render the manufacture almost an exclusive one.—I am, &c.,

T. H. Duke.

TRAPLESS CLOSETS AND DRAINS.

Sir,—Mr. G. A. Foster, pp. 427-428, appears to be writing the result of honest conviction; but before the readers of the Building News will accept the soundness of his views they will, I feel sure, be glad to see Mr. Foster's answers to the following questions:—

1. Has Mr. Foster any direct or indirect interest in the sale of any form of "trapless closet"?
2. How many trapless closets (approximately) has he had fixed?
3. How, in any case, the continuity of the drain was not broken?
4. For what length of time have the closets been fixed?
5. Has Mr. Foster discovered any disadvantages of trapless closets, and if he has, what are they?

As Mr. Foster has quoted Mr. Bailey Denton, I refer him to pp. 71 and 72 of "Sanitary Engineering" where, breaking the continuity of the pipe from the closet to the sewer, if it can be effected without nuisance, is distinctly advocated, and where a mode of disconnection without nuisance is referred to; this work was published in 1877, and since that date many architects and engineers have adopted the still more simple expedient of a siphon, open channel and manhole (no patent being required), which, when properly constructed is apparently free from objection. I shall be exceedingly obliged if any of your readers can give an instance of

failure of this method of disconnection.—I am, &c.,
ERNEST TURNER.
246, Regent-street, 16th Oct.

Sir,—After a careful and considerate perusal of Mr. Buchan's tirade, which just manages to escape being entertaining and reliable, I find there is very little in it bearing any weight upon mine of the 8th inst., and still less requiring a reply. The extraordinary statements he makes concerning the subject generally, and trapless closets and their water supply in particular, naturally lead one to suppose he knows very little of the matter; possibly the trapless w.c.s he alludes to were faulty through bad workmanship, or materials, or both, or there may be some ulterior motive in view. I have myself used a trapless w.c. for over three years, and with the exception of a new indiarubber sealing to the plug, it has required nothing whatever in the way of cleaning or repairs. My experience is that they are far preferable to trapped closets, and I still maintain that the solid seal of a sealed plug is infinitely superior in every respect to the hydraulic seal of a water-trap; traps of all descriptions (with the exception of Bower's and Banner's, which have solid seals) being more or less a continual source of nuisance.

Contrasted with Mr. Buchan's outburst, the courteous communication of Mr. William White is quite refreshing, and I hasten to reply to it. The advantage of a solid plug over a trap, even in the arrangement described by him, is, that it is absolutely certain no sewer-gas can enter through it into the house; whereas it is possible for the hydraulic seal of the water-trap (although there may be no pressure) to absorb it on the one side, and give off again on the other, and as the soil-pipe is also used for ventilating the drain, it is best to be on the safe side. Any frost affecting the trap would certainly also affect the plug, but in the latter case it could be easily guarded against and protected. As regards danger from leakage, obstruction, and wear, the first evil would, in all probability, be caused by the last, and a new indiarubber seating to the plug is an easy and inexpensive repair, whilst a proper and sufficient flush of water effectually carries away all obstructions in the shape of excreta, paper, &c. Respecting the entrance of any sewer-gas during the raising of the plug: there is a constant upward current through the soil and ventilating pipe by air entering an inlet at the foot and being carried out at the top, so that when lifting the plug an additional inlet is thus formed, which can be easily and amply proved with a taper, the flame of which is drawn *down* by the inrush of air; at the same time no offensive smell can be perceived arising from the opening.—I am, &c.,
G. A. FOSTER.

Sir,—In a letter signed "W. P. Buchan, sanitary engineer," of your last week's impression on "The Evils of Trapping in Connection with Closets and Drains," a statement is there made "that in a 'public newspaper' the attempt to do without water-traps, tried at Guy's Hospital, London, had ended in failure." Allow me to state that, so far as the above hospital is concerned, the water-closets, sinks, and baths, &c., remain precisely in the same state in which they were left by Mr. Banner in the autumn of 1876, now upwards of four years ago, the water-closets having only the water-traps in bottom of basins, and the water from baths and sinks simply siphoned off by bending the waste-pipes in each case.

My impression is that, had the whole of the quotation, and not a part only, been given from the "public newspaper," it would not lead to the idea that the whole system adopted at "Guy's" was an "utter failure," which in reading these concluding lines is the impression it certainly might convey. I will only add that, until a better, and, if possible, more simple plan (which I greatly doubt) can be devised, I should be very sorry to have any alterations made in the existing arrangements, which certainly cannot be considered in any way a failure.—I am, &c.
ARTHUR BILLING, F.R.I.B.A.
(Surveyor to the Hospital.)
Surveyor's Office, Guy's Hospital,
London, S.E., Oct. 20.

NEWBURY GRAMMAR-SCHOOL COMPETITION.

Sir,—My attention has been called to a letter from an architect complaining of a certain charge being made for the postage of the particulars supplied to architects.

I wish to state that the trustees have no knowledge of this circumstance, such matters being left to the discretion of the clerk to the trustees, to whom I would advise your correspondent to apply if he feels any grievance.

The trustees are most desirous to act with all fairness and consideration to the architects who may compete.—I am, &c.,
ONE OF THE TRUSTEES OF THE NEWBURY MUNICIPAL CHARITIES.
Newbury, Oct. 19.

Sir,—Intending competitors will do well to compare the accommodation required with the limit of the outlay desired by the trustees, and the condition upon which the successful architect will be employed.

I think it will be seen at once by those experienced in the cost of such buildings, that these cannot be erected for £7,000. So in the end the trustees would probably maintain the right they reserve to retain the selected plans and discharge their liability to the successful architect by the payment of £50; and the further history of the matter will resemble the history of many another competition.—I am, &c.,
Oxford, Oct. 19. "NON SIBI."

* * *

Intercommunication.

QUESTIONS.

[6266.]—**Weight Carried by Brick Pier.**—What weight may a brick pier, 23in. by 9in. and 9ft. high, built in cement, be expected to carry with safety?—G. M.

[6267.]—**Ice-House.**—What is the best way of constructing an ice-house in a cellar?—W. Z. X.

[Descriptions and illustrations of methods of constructing ice-houses will be found in the BUILDING NEWS of Jan. 3, 1868; Aug. 25, 1871; and in the *English Mechanic* of Oct. 8, 1869.—ED. B.N.]

[6268.]—**Spotty Walls.**—Perhaps some of your numerous readers can give a reason for the following:—All the internal walls, including the bedrooms, of a gentleman's residence in the country, have been coloured in distemper two or three times since the house was rebuilt, fifteen years ago. Two or three months after each time they were done the colouring universally turned spotty, just like damp would show, but in no case is the colouring loosened. It is just as firm on the walls as the parts not discoloured. Permanent colours were used, so it is not faded. It shows more in damp weather than at any other time. Hints as to what is the cause, and how it can be prevented will oblige.—PERPLEXED.

[6269.]—**Sea-sand in Mortar.**—Good, clean sand is so difficult to obtain near London, that our attention has been directed to the offer of a certain Railway Company to bring *sea-sand* to London, at a cost of 42s. for 7 tons. We have seen the sand, and, certainly, it is better to look at than the loamy stuff (often containing 25 per cent. of gravel) sold as pit and river sand. We are informed by a builder at Hastings that they use sea-sand just as we use pit-sand, without *any particular washing* to remove the *salt*, and without any objectionable result. Perhaps some of your readers can inform us if there is any *real* objection to the use of sea-sand in mortar and plastering stuff.—THOS. AND WM. STONE.

[6270.]—**Removing Cement from Encaustic Tiles.**—What will effectually remove cement from the surface of encaustic tiling?—WALTER T. FELDOM.

[6271.]—**Rights of Architects' Assistants.**—Is it lawful, or is it contrary to rule, for an architect's assistant to practice on his own account, if he takes good care that any work of his own in no way interferes with him performing properly his duties towards his employer while in his office?—T. P. F.

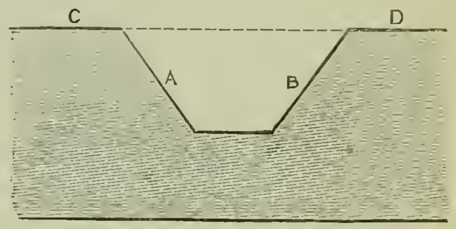
REPLIES.

[6257.]—**Yellow Deals** are not necessarily 12 and 24ft. long, or 3in. by 9in. in scantling. They reach the English market in all lengths and sizes. They are the produce of the *Pinus sylvestris*, commonly known to us as the "Scotch fir," and are shipped from the Baltic and White Sea provinces. The average number of deals cut from a tree depend on the size and length of the logs, which vary with locality, and with the rules or restrictions of felling in the various forests. The number of trees to the acre is scarcely a matter that can be reduced to figures. The woods are natural to the country, and presumably "as old as the hills." In one district the trees may be sufficiently apart to admit of the light reaching the ground, and for a grazing district being formed, whilst in another it may be dark at noonday by the dense heading of interlocked foliage. The majority of such trees would not exceed 18in. in diameter at 3ft. above the ground, and they would not approach one another nearer than an average of 6ft.—W. S.

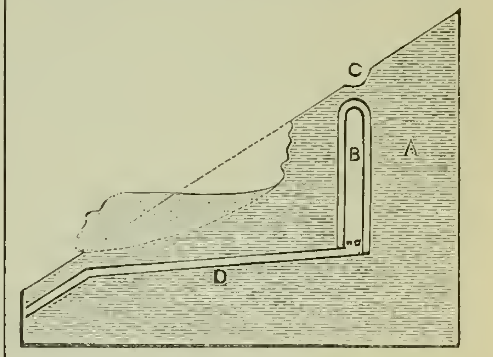
[6258.]—**Valuations.**—There is a good treatise on valuations published in Lockwood's series, entitled "House Property." For general information Gwilt's "Encyclopædia" may be consulted. Ryde's Text Book is, perhaps, the most comprehensive work on valuations generally.—G. H. G.

[6261.]—**Foundations.**—In reply to "Junior," I should first make an examination of the foundations and ground on the side of porch, and between it and tunnel. If the strata are level and the soil solid and unyielding, the tunnel has probably not endangered the foundations if they are well spread and sufficiently deep. If the foundation of old tower rest on a solid bed of concrete, I should not have much fear. On the contrary, if examination shows a poor foundation, or if the soil is of a shifting sand or loose character, additional precautions might be taken before proceeding with the tower. As a safeguard, an excavation might be made round the existing foundations and a large body of concrete thrown in so as to extend the bearing, though the surest plan would be to rebuild the tower, carrying down the footings to a solid bed, or, if necessary, to some distance below the crown of tunnel. Inspection should be the only guide.—G. H. G.

[6261.]—**Foundations.**—"A Junior," in his question about adding the weight of a spire to a tower erected in proximity to a railway-tunnel, must look for his answer, either for or against the practicability of such an act, in the nature of the ground. The tunnel will drain the adjoining land in the same manner as a cutting, and tap or break the uniform flow of water in the strata of the ground. Now, as this strata is never found in a level state, it follows that the water will flow to the low side, or point. In its course it may be cut by a tunnel, or an open excavation, where its water would be cast or shed. This accounts for the fact in railway cuttings of wet and dry banks, the wet being the seat of land-slips and depressions, and unsafe for building on, the dry being practically uninjured by the excavations; see diagram. A is the dry bank, B the wet bank, upon which the water is shed or cast, a bank subject to land-slips and depressions. C is a site upon which it is uniformly safe to build, and D one upon which that operation would be attended with danger.—W. S.



[6262.]—**Hill-Side.**—The slipping of the earth in this instance is parallel with the one explained in answer 6261 (Foundations). It is a case of the wet side of a bank, the low edge of the strata, from which point the water is discharged. It is one familiar to us in cutting through clay for railway purposes. The only effectual mode of dealing with the case in point is to sink a series of pits in the ground to intercept this flow of internal water, and to connect the pits at the bottom by a layer of drain pipes, such as are used for draining land. The pits would require to be lined with dry bricks, that is, with bricks without mortar, and gathered over at the top. The lowest of these would require a drain to carry the water down to the pond. As a system of drainage this would be inoperative, except in rainy seasons, which, of course, are the seasons of land-slips. Upon this being done the present breaks in the hill might be made good, and a small catchwater drain formed in the turf above the line of fracture to throw off to the right and left the surface water, which would otherwise become water of saturation in the damaged ground. See diagram. A, the water strata, the activity of which caused the landslip; B, one of the intercepting pits; C, the catchwater drain sunk in the turf; D, the drain from the lowest pit to the pond.—W. S.



[6263.]—**Doors.**—One can give a shrewd guess as to your contractor's character. The doors are but ¾in. ledged doors. The battens should be 1½in. thick to be 1½in. ledged doors.—JACK PLANE.

[6263.]—**Doors.**—"One Puzzled" can scarcely be in earnest in treating a 1½in. ledge door as being of ¾ battens and ¾ ledges. How would he translate the every-day terms of ¾ and ⅞ ledge doors? Could he possibly take them to mean ⅜ battens and ⅜ ledges? The question answers itself. The ledges, which only increase the thickness of a fractional part, are ignored in speaking of the thickness of the door. It is a well understood point that needs no explanation. It is one parallel to 1½ framed doors, being only 1½in. thick in certain parts (the panels). If a 1½ framed ledge door is specified it means a 1½ door, the centre filled up with ¾ boards and ¾ rails (ledges) instead of panels. The case might be further illustrated by an architect's drawing-board. One ¾ thick would be made of wood of that thickness, the ledges on the back not being considered when speaking of its thickness.—W. S.

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At the annual meeting of the Archdeaconry Church Building Society, held at Bury St. Edmund's on Wednesday week, grants were made of £20 to Stanningfield and £25 to Poslingford towards the restoration of those village churches, and of £25 towards the rebuilding of a district church at Leavenheath, near Nayland.

WATER SUPPLY AND SANITARY MATTERS.

Cardiff Water Supply.—Mr. John Taylor, C.E., has furnished a report to the town council of Cardiff on the water supply of the borough, and the best mode of carrying out the works sanctioned by the Act of 1878. Mr. Taylor states that the result of the present year has proved that the existing works are insufficient to maintain the proper water service to the district, and that, should a similar dry season occur next year, with the additional demand for water, owing to the ordinary increase of population, the present works will be found to be dangerously inadequate. He recommends—first the construction of filtering culverts and works connected therewith at Ely; second, the construction of new filters and works at Cardiff; and third, the construction of a store reservoir at Cardiff. These extensions would, he estimates, increase the storage capacity at the service of the town from 260 to 270 millions of gallons, or by 90 days' supply of three million gallons per day, irrespective of the dry weather yield of the springs, and the total cost would be about £85,000. Mr. Taylor's report was received at Monday's meeting of the Cardiff town council, and ordered to be printed and circulated, the waterworks committee being also instructed to consider the question of sinking new artesian wells.

Glasgow.—A report has just been issued by a deputation appointed by the magistrates and town council of Glasgow, into the treatment of sewage in various towns in England. The deputation do not venture to recommend a definite scheme for the disposal of the sewage of Glasgow, but express a decided opinion that the sewage of the north and south sides of the river should be treated separately; that on the north being taken to Dalmuir by a high-level and a low-level sewer, while that on the south, the whole of which would require to be pumped, should be taken as far down the river as possible. They are decidedly favourable to the intermittent system of precipitation as distinguished from the constant flow process; but inasmuch as the same construction of tanks and other apparatus is required for all systems of precipitation, they suggest that the nature of the precipitant should be left for future consideration. In an appendix to the report, Dr. Wallace, the medical officer of health, gives the results of experiments which were made during July and August on the oxidising power of river water on purified sewage. These led him to the conclusion that Glasgow sewage, properly defecated and introduced into the Clyde at a point below the city, will not, under any circumstances, give rise to a nuisance. As to the best agent for the precipitation of sewage, he reports that, although alumina produces a somewhat more satisfactory result than lime, the advantages obtained by its use are not sufficient to compensate for the increased cost of purification, which is equal to four times the outlay on lime. If the cost of some sulphate of alumina, or of a mixture of alumina and oxide of iron, could be approximated to that of lime, he should have no hesitation in recommending its use in preference to lime.

London Water Supply.—A meeting of delegates from various vestries and district boards of the metropolis was held on Wednesday in St. Martin's Hall, to consider what steps ought to be taken in the next Session of Parliament, in the interests of the ratepayers, with regard to the question of water-supply. It was agreed that, as the report of the committee on the subject recommended that the Government should introduce a Bill to constitute a water authority of a representative character, in order that the supply in London should be under the control of some public body representing the interests of the consumers, a communication should be addressed to the Home Secretary, asking whether notice of such a measure would be given by the right hon. gentleman, and limited to such object.

LEGAL INTELLIGENCE.

Extras and Delays.—At the Leeds County-court on Monday, before Mr. W. T. Greenhow (the Judge), Charles Wilson, builder, Cambridge-road, sued Samuel Pickard, bricklayer, Camp-road, to recover £10 16s. 6d. for damages sustained in consequence of an alleged breach of contract by the defendant in the erection of two houses in Servian-road; also £2 7s. 6d., being the amount paid to defendant in excess of the amount for which he had contracted to do the brickwork. Mr. Warren, who appeared for the plaintiff, explained that when disputes arose between the parties as to the works, especially on the point of delay, the plaintiff employed other persons to complete the contract, and the amount now claimed as damages represented the amount so paid to finish the work. Mr. Middleton appeared for the defendant, and cross-examined several of the witnesses as to extra work, not included in the plans, which explained the alleged delay and caused additional expense. He said the plaintiff had first violated the agreement by calling in other workmen without giving the defendant an hour's notice, and that the defendant was hindered from proceeding with the work owing to the absence of definite instructions from the plaintiff. The Judge decided in favour of the plaintiff for the amount of £10 16s. 6d.

The Metropolitan Building Acts.—At Marylebone Police-court, on Monday week, John Allen, builder, of 24, Kilburn-park-road, was summoned by Mr. Alexander Peebles, district surveyor, for neglecting to give notice to him of certain building works, and executing such works before giving any notice. Mr. Peebles stated that on September 30th he visited Abbey-road Chapel, St. John's-wood, and found that the defendant was carrying out some alterations to the building. An apse or alcove was being formed, and the wall of the gallery had been considerably reduced in thickness. No notice of the work had been given. Mr. Sampson, solicitor for defendant, said that a new organ was being put into the chapel, and they were going to add externally the strength they had taken away internally. The defendant had been away, and left it with his workpeople to give the proper notices. Mr. De Rutzen, the magistrate, said it was absolutely necessary that these preliminaries should be complied with. The defendant would be fined £3 and 12s. 6d. costs.

The Leamington Waterworks and the Corporation.—The dispute between Messrs. Young and Co., the contractors for the Leamington Waterworks, and the Leamington Corporation was on Wednesday submitted to the arbitration of Mr. Watkin Williams, Q.C., M.P., at the Surveyors' Institute, Westminster. Mr. Edwin Jones, in opening the case, said he appeared for Messrs. Young and Co., who were plaintiffs in an action in which the Mayor and Corporation of Leamington and Mr. George Bestall Jerram were the defendants. The action was brought to recover the balance of a total amount of £15,209 9s. 4d. for work done. The plaintiffs had been paid £8,450 on account, leaving a balance unpaid of £6,759 9s. 4d., for which amount the action was brought. The account began with a contract dated November 9, 1876. This was a contract entered into by the Mayor and Corporation of Leamington with Messrs. Charles Powis and Co., to do work and supply machinery, and had reference to the 15th section of an Act which enabled the Corporation, in a certain event, to take the work out of the contractors' hands and finish it themselves; and went on to allege that in June, 1878, Mr. Jerram was appointed as surveyor. But in July, 1878, on a report being made to the Mayor and Corporation, a resolution was passed by that body requiring the surveyor to take energetic measures to complete the work, and the work of completion was left in the hands of Mr. Jerram, the borough surveyor. Subsequently an arrangement was made by which the plaintiffs were to complete the work begun by Messrs. Powis and Co. for a fixed sum. They completed this, and did other work. The undertaking was accepted by defendants, and certain sums were paid. The defendants denied that they entered into the contract, as alleged, with plantiffs; that Mr. Jerram was the agent for the purpose; that there was nothing due from them to the plaintiffs; and that there was no contract under the common seal. Mr. Jerram admitted the greater part of the statement of claim, but urged that he entered into the contract as agent for the defendants, relying upon the first section of the Public Health Act of 1875. He thought that, in the event of his being considered liable, he had the right of passing his liability on to the Mayor and Corporation of Leamington. A lengthy discussion followed, in the course of which the arbitrator made a suggestion, which was acceded to by counsel on both sides, that the further hearing of the present inquiry should stand over until a special case had been put before the Court as to how far the contract between the Corporation and the plaintiffs, in the absence of the Corporate seal, was binding upon that body.—The proceedings then terminated.

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A new cemetery, four acres in extent, at Kirkley, next Lowestoft, was consecrated by the Bishop of Norwich on Saturday week. The building of the chapels and the laying out of the grounds, begun by Mr. Brett, were completed by Messrs. Lucas Bros., contractors, Lowestoft. Mr. J. Young, of Norwich, built the lodges, and Mr. Gaymer, of Lowestoft, built the lychgate. Mr. J. L. Clemence, of Lowestoft, was the architect, and the total cost was £3,300.

The annual meeting of the Wiltshire Archæological Association was held on Friday, when the annual report was read, showing a slight increase in members, the number now being 392, and referring at length to the visit of the British Archæological Association to Devizes in August. Lord E. Fitzmaurice, M.P., was re-elected president, and Mr. W. H. Butcher, of Devizes, as hon. secretary.

Our Office Table.

A deputation on Saturday waited on the Lord Mayor, at the Mansion House, to urge on him the importance of placing bridges across crowded thoroughfares, and it was argued that the police now engaged in assisting passengers across the road could be dispensed with, and the money thus saved might go toward the expense of the bridges. His Lordship quite dissented from the views expressed. He did not think that people generally would use the structures if they were erected, and for his own part, though occasionally suffering from the gout, and getting in years, he would prefer the old way of crossing the road. He, however, recommended the deputation to wait on the Commissioners of Sewers. The deputation should have waited a week or two. His present Lordship is too favourably inclined to "refuges" of the new Temple Bar memorial sort to see any merit in suggestions which have been repeatedly urged by all who really know anything about the dangers of London traffic, and which the Society for the Prevention of Street Accidents are doing well to bring again before the attention of the public.

A correspondent writes to the *Times* to question the correctness of the statement of the correspondent of that paper at Cologne, that the *Dom* of Cologne is called "Dom" emphatically, the ordinary name of other German cathedrals being Münster. He says:—"*Dom* is the cathedral; *Münster*, the *monasterium*, or English minster, the monks'-place. As in England, so in Germany, the cathedral may, here and there, have been served by monks, and '*Münster*' have got the better of '*Dom*.' But the cathedrals called *Münsters* are very few—Freiburg, in Breisgau, Strassburg (with, however, a *Domplatz*), Basel, Berne, Constance, are probably all; the *Münsters* at Bonn and Aix-la-Chapelle not being cathedrals. The immense majority of the German cathedrals, as many of your readers will remember, are *Doms*. There is a *Dom*, with generally a *Domplatz* or *Domhof* for the open space surrounding it, at Münster, Trier, Mainz, Worms, Speyer, Frankfurt-on-the-Main, Wurzburg, Regensburg, Bamburg, Passau, Magdeburg, Brunswick, Fulda, Erfurt, Berlin, Bremen, Lubeck, Breslau, Posen, Königsberg, Graz, Pressburg, and, I think, Osnabruck, Paderborn, Hildesheim, and Limburg. Such names speak for themselves, and pretty well exhaust the German bishoprics, past and present. Occasionally a cathedral is better known by its titular name—St. Stephen's, in Vienna; the Frauenkirche, in Munich; St. Veit's (or *Dom*), in Prague. But *Dom* is the recognised German for cathedral, and *Dom-herr* (cathedral-lord) for a cathedral canon, not *Münster* or *Münster-herr*. The supposed rivalry between Duomo and Basilica is, I think, quite a fancy of your correspondent's. Basilica is nowhere synonymous with cathedral, which Duomo or Dom invariably is." "O. S.," however, writes again:—"'R. H. B.' is mistaken when he says (in wishing to correct me) that the Frauenkirche, at Munich, is not a cathedral, and that 'the Metropolitan of Bavaria' is Archbishop of Freisingen. The Frauenkirche is the cathedral of the Archbishop of Munich and Freisingen (*Monacensis et Frisingensis* in Latin—see the 'Gerarchia Cattolica,' &c. Roma, 1879), and there are two Metropolitans in Bavaria—the Archbishop of Munich and he of Bamberg, each with three suffragan bishops. Munich is another Liverpool—a new see—which, however, unlike Liverpool, in its birth almost proved fatal to its parent. . . 'R. H. B.,' however, illustrates my contention that churches do not lose their old names by becoming cathedrals."

The *Citizen* states probate of the will of Mr. Thomas Henry Wyatt, F.R.I.B.A., late of No. 77, Great Russell-street, Bloomsbury, architect, who died on the 5th of August last, was granted on the 6th ult. to Messrs. Matthew Wyatt, and Thomas Henry Wyatt, the only sons, the executors, the personal estate being sworn under £30,000. The testator bequeaths the goodwill of his business, the lease of his offices, and all his architectural drawings and books to his son Matthew; to his daughter, Constance, in addition to other provisions, £6,000 for life; at her death, such sum is to go among his son Thomas Henry's children; and there are many other bequests to his children and others. He also bequeaths to the Architects' Benevolent Institution, the Incorporated Society, the Middlesex Hospital, and the Royal Institute of British Architects, £100 each; and upon the death of the daughter of his old friend, George Moore, a certain trust fund of £500 is to be paid either to the treasurer of the R.I.B.A. or to the Architects' Benevolent Institution. One-third of the income of the residue of his property is to be paid to his daughter-in-law, Mrs. Charlotte Wyatt, and the other two-thirds to his son, Thomas Henry, and on the latter's death to his wife, Mrs. Julia Wyatt; ultimately the said residue is to be divided between his grandchildren, the children of his said sons.

Professor Monier Williams, in a letter to the *Times*, urges the adoption of more systematic efforts for the preservation of the Roman villa recently found near Brading, which he conjectures may have been the residence of the Roman governor of the Isle of Wight. The work is already suffering from the autumnal storms, and the designs and colouring of the tesselated floors, which are now as perfect as when hidden from view 16 centuries ago, will soon be irreparably injured unless some covering is speedily erected. The remains are crossed by a boundary-line of two properties, and 6d. is charged for admission to either. The writer suggests that both should be brought under one roof, and thinks that if 1s. were paid by each person for admission, enough money ought to be forthcoming without any general subscription. Messrs. J. E. and F. G. H. Price, who have conducted the excavations, have replied, stating that a contract has been made with Mr. Moses Cooper, of Brading, to erect substantial sheds over all the principal floors on Lady Oglander's property, joining the shed erected by the neighbouring farmer. They end by appealing for "large funds and contributions from antiquarian societies and the public generally," declaring that the slight fee necessary to prevent overcrowding will be insufficient. A subsequent letter states that both sheds will be thrown into one, and an inclusive charge of 6d. made for admission. Mr. John Dore writes to the *Hampshire Independent*, expressing surprise that the remains of another Roman villa at Combley, near Arreton, in the Isle of Wight, lie buried and neglected, although they were discovered seven years ago.

The death is announced at Rome, at the age of eighty, of a most celebrated collector of antiquities—the Marquis Campagna. Under the reign of Gregoire the Sixteenth the Marquis Campagna was director-general of the Mont-de-Pieté. A victim, it is said, of the hated Cardinal Antonelli, he was accused of defalcations in the administration of this establishment, and dismissed from his office, and saw his rich Etruscan collection, which was of great value, pass into the hands of the Pontifical government. Of this collection, known under the name of Campagna, but little remains at Rome at the present time. The greater part of it found its way to France and Russia.

For some days considerable crowds have gathered before the new Hotel de Ville, in Paris. The architect is trying, by means of models, the probable effect of the statuary with which it is proposed to adorn the building. Above the parapet of the centre block of the Hotel de Ville two statues have been placed in position. They represent heralds-at-arms in the costume of the period when for the first time the limits of the functions of municipal bodies were fixed. The statues are of natural size, and are almost touching one another. In order to judge of the decorative effect, two others have been set up at the opposite angle of the central pavillon. A small flag is attached to the halberd of one of the heralds-at-arms and serves as a weather-cock. The retention of this appendage is not however yet decided upon. Though the question of cost would, no doubt, in the vast majority of cases be a complete bar, at all events in the present state of the mind of the general public, to our adoption of the system so common in France of testing the effect of sculpture before its execution, yet in some cases it would be possible and advisable.

A meeting of the working classes of London was held on Wednesday evening at the Mission Hall, Great Arthur-street, St. Luke's, with a view to securing dwellings for the accommodation of the people in the stead of the houses demolished to effect street and other improvements. Mr. W. Hart moved a resolution, which was adopted, expressive of approval with the suggestion of the Works Committee of the Metropolitan Board of Works to apply to Parliament for powers to erect dwellings in the place of those destroyed under the Artisans' and Labourers' Dwellings and Streets Improvements Acts; and pointed to the profits realised by Industrial Dwellings companies in disproof of the fallacy that the erection of artisans' dwellings by public bodies would be tantamount to subsidising the people. The vestry of St. Luke's, the mover remarked, had invited tenders for the building of artisans' dwellings on vacant land belonging to them. The meeting also by resolution expressed its warmest thanks to the Home Secretary for the solicitude he has displayed in the interests of the poor, who had been and were about to be displaced by operations under the Artisans' Dwellings Act; and the meeting further drew the attention of the Government and municipal bodies to the fact that thousands of the working class were injuriously affected by the demolitions which had taken place, inasmuch as they had been driven into already overcrowded and insanitary dwellings.

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CHIPS.

New buildings for the Blue-coat School at Wolverhampton have been opened. The buildings are being erected in red brick, with moulded brick bands and strings. The architect is Mr. T. H. Fleeming, and the builder is Mr. Henry Lovatt.

The Birmingham Society of Artists' lecture arrangements for the present season are of special interest. Mr. J. H. Chamberlain opens it by two lectures on "Art Ghosts." He is to be followed immediately by Mr. A. W. Hunt, the well-known painter, who takes for his subject "Turner in Yorkshire." Early in December Mr. William Morris closes the season with a lecture entitled "Hints on Home Decoration."

A new dry dock constructed at Cubitt-town, Poplar, was publicly opened on Saturday. It is 390ft. long by 84ft. wide, and when filled with water has a depth of 22ft. Mr. Mackonochie was the engineer of the works.

A new Wesleyan chapel is in course of erection in the Restormel-road, Lostwithiel. The style is Early English, and the architect is Mr. James Hicks, of Redruth. The contracts have been taken by Mr. Philp, mason, and Mr. Brown, carpenter.

New banking premises are about to be erected in St. Mary-street, Cardiff, for the London and Provincial Bank. The style will be Italian Renaissance, harmonising with the town-hall, post-office, and West of England Bank in the same street. The architect is Mr. W. D. Blessley, of Cardiff.

A new Presbyterian church is about to be built at Woodside, Glasgow, from the designs of Mr. Henry Higgins, junr. The style is Romanesque of severe type, and the plan consists of nave with aisles, hollow transepts, and chancel. Galleries will be provided in the transepts and at west end of nave, in each case below the line of clerestory lancets which will be made continuous round the church. The estimated cost of the church is about £9,000.

The memorial-stone of St. Paul's Working Men's Club, in the Bohemia-road, Hastings, was laid on Saturday. The building will include a bar, bar-parlour, and billiard-room on ground floor, and a large room above, seat 300 persons, and divided by a movable partition. Mr. W. J. Grant is the architect, and Messrs. D. and F. Russell are the builders; the cost will be about £900.

The London and North Western Railway Company propose to construct a covered bridge and passage somewhat similar to those from the Charing Cross hotel over Villiers-street, from the Euston hotel to the terminus over Drummond-street, which is to be lowered in level at this point. The plans have been prepared by Mr. Stansby, architect to the railway company, and Messrs. Kirk and Randall have taken the contract; but some local opposition has been aroused, and the vestry of St. Pancras have not at present given their consent.

Carved wainscot-oak choir stalls are being erected in the chancel of St. Anne's church, Burlington-street, Brighton. The eight bench-ends are each enriched by a boldly-carved figure of an angel in full relief, the four next the organ holding a harp, a trumpet, a violoncello, and a bell. the latter instrument being carried in the hand and struck upon the outside. On the opposite bench-ends the angels are clad in partial armour representing the "Sword of the Spirit," the "Shield of Faith." the "Breastplate of Righteousness," and the "Helmet of Salvation." The desk-fronts have panels of foliated tracery. The carving is being executed by Messrs. Farmer and Brindley, of Westminster-bridge-road, London.

At Norwood, Surrey, on Saturday week, the foundation-stone was laid of the baths now in course of construction in Birchanger-road, by the Croydon Local Board of Health. The architect is Mr. Lambert.

A memorial cross, 9ft. 6in., has just been placed in the churchyard of South Reston, Lincolnshire, in memory of Joseph Hoodlass, who for more than 40 years was the parish-clerk. It has been erected from a rough design by the deceased, put into shape by Mr. James Fowler, architect, of Louth.

The new church of St. Saviour, at Erlestoke, near Devizes, was consecrated on Wednesday week. It has been built at a cost of £6,000 from the designs of Mr. G. E. Street, R.A., and is Perpendicular Gothic in style.

A new Wesleyan chapel and schoolroom were opened at Thorpe St. Peter, near Spilsbury, on Tuesday week. The buildings are of red brick with white brick dressings, and the fittings are of pitch-pine. Mr. John Holmes, of Wainfleet, was the builder.

The new church of St. Mary Magdalen at Prudhoe was consecrated on Monday. The entire cost of the building will be about £2,000. The church, of which Mr. F. W. Rich, Newcastle, has been the architect, is designed in the Early English style. It is built of stone, and seats a congregation of 300.

A new reredos was opened at St. Jude's Church South Kensington, on Sunday week. The subject is the "Adoration of the Lamb," Rev. v. The sacred symbol occupies the central panel; on either side are the living creatures, and on the north, south, and east walls of the sacrarium are representations of the prophets, apostles, and other heavenly choir, in fresco. The sculpture in alabaster and marble, is by Mr. Earp, of Kennington, and the mosaics are by Messrs. Salviati and Burke, of London and Venice. The whole design is by Mr. Frampton, of Southampton-street, Strand.

Memorial-stones of a new Baptist school-chapel were laid at Cathays, near Cardiff, on Wednesday week. The building will accommodate 200 persons, and will cost £700, forming the first portion of a scheme for a chapel and schools, to cost in all £5,000. The architect is Mr. J. P. Jones, and the builder Mr. Howard.

An illustration of the extent to which building operations are being carried out in the northern suburbs of London is found in the fact that at the monthly meeting of the Tottenham local board of health last week, 253 plans for new houses were passed, of which number 168 are proposed to be erected on Leschella's estate, at Page-green.

An exhibition of competitive designs for Christmas and New Year cards, is now open at the Dudley Gallery. It has been inaugurated by a Fine Art publisher, who has placed £500 at the disposal of the judges, to be awarded in fourteen prizes for the best and most original sets of designs. The judges are Sir Coutts Lindsay, Mr. H. S. Marks, and Mr. Boughton. Nearly a thousand designs are exhibited, and more were ready if they could have been admitted. All the receipts over the expenditure are to be paid over to the trustees of the Artists' Benevolent Fund.

The new church of St. Maurice, York, is rich in the possession of an old stone font, painted in imitation of Caen stone, and recently sanded. It is not a mere relic of the vandalism of past ages, but a specimen of the art of the present day. A correspondent assures us that it is the result of an arrangment between an old parishioner and an ecclesiastical decorator (?) who undertook to execute the wonderful transformation for the sum of ten shillings and sixpence!

◆

Epps's Cocoa.—Grateful and Comforting.—"By a thorough knowledge of the natural laws which govern the operations of digestion and nutrition, and by a careful application of the fine properties of well-selected Cocoa, Mr. Epps has provided our breakfast tables with a delicately-flavoured beverage which may save us many doctors' bills. It is by the judicious use of such articles of diet that a constitution may be gradually built up until strong enough to resist every tendency to disease. Hundreds of subtle maladies are floating around us ready to attack wherever there is a weak point. We may escape many a fatal shaft by keeping ourselves well fortified with pure blood and a properly nourished frame."—*Civil Service Gazette.*—Sold only in Packets labelled—"James Epps and Co., Homœopathic Chemists, London."—Also makers of Epps's Chocolate Essence for afternoons

MEETINGS FOR THE ENSUING WEEK

Friday.—Architectural Association. Opening conversazione at the galleries, 9, Conduit-street, W.

◆

Trade News.

WAGES MOVEMENTS.

Bradford.—The engineers' strike, which commenced on March 15th, 1879, has terminated, the last of the men who have been on strike returning to work on Monday morning. Two hundred of the men who struck are now in America.

◆

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[Advt.]

◆

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters.
Designs and Estimates.
General Repairs and Alterations Executed.
Experienced Workmen always in readiness, and sent to any part of the country.—[Advt.]

◆

BOX GROUND STONE
Is the Best for Use in all Exposed Positions, being Well-known and Tried Weather Stone.

50,000 Feet Cube in Stock.
PICTOR & SONS,
BOX, WILTS.
[Advt.]

◆

TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Bishopstoke.—For works in stabling, club-room, &c., at the "Crown Inn," Bishopstoke, Hants, for Sir Fredk. Perkins. Mr. William Burrough Hill, architect. Quantities supplied by the architect;—

Egg	£524	8	6
Crook	447	10	0
Cole	420	0	0
Harrison and Reading	419	5	0
Martin	397	10	0
Batten	390	7	0
Searle	385	0	0

Blackheath.—Tenders for a house at Westcombe-park, Blackheath, for Capt. Armstrong, R.E. Messrs. J. and J. S. Edmeston, architects. Quantities by G. N. McIntyre North:—

Holland, J.	£3,061	0	0
Boyce, T.	3,013	0	0
Grimwood, G., and Sons	2,990	0	0
Lucas and Son	2,850	0	0
Kirk and Randall	2,843	0	0
Smith, J., and Son	2,577	0	0
Grover, J.	2,552	0	0
Gould and Brand	2,484	0	0

Bournemouth.—For stoneware pipe sewers, Bournemouth western extension sewerage works, for the Bournemouth commissioners. Mr. G. R. Andrews, surveyor. Quantities supplied:—

Saunders & White, Bournemouth	£1,801	0	0
Sharland, Wimborne	1,046	11	0
Etheridge and Co., Manchester	859	3	0
Hoare, Bros., & Walden, B'mouth	748	19	0
Bell, Wood-green, London, N.	680	0	0
Pontifex & Wood, Shoe-lane, E.C.	678	5	0
Leylands, London	583	10	0
Meats, Bros., Nottingham (accepted)	550	0	0

(Surveyor's estimate, £591.)

For cast-iron outfall pipe sewer:—

Bell, Wood-green, London, N.	£2,580	0	0
Etheridge and Co., Manchester	2,290	0	0
Pontifex & Wood, Shoe-lane, E.C.	1,480	0	0
Leyland, London	1,346	0	0
Howell, Poole	1,145	0	0
Hoare, Bros., & Walden, B'mouth	936	0	0
Meats, Bros., N'ingham (accepted)	760	0	0

(Surveyor's estimate, £1,600.)

Bournemouth.—For roads under 150th section Public Health Act, 1875, for kerbing and guttering, for the Bournemouth commissioners. Mr. G. R. Andrews, surveyor. Quantities supplied:—

Saunders & White, Bournemouth	£2,216	8	9
Leyland, London	2,066	15	6
Pond, Wimborne	2,010	0	3
Meats, Bros., Nottingham	1,988	6	4
Knight, Wanstead Park	1,968	0	0
Gibson, Exeter	1,948	18	0
Free, High Wycombe, Bucks	1,850	11	8½
Rutty, Bromley-by-Bow (accepted)	1,706	5	0
Hoare, Bros., & Walden, B'mouth	1,670	4	5

(Surveyor's estimate, £1,899.)

Brighton.—For pulling down and re-erection of premises in Queen's-road, Brighton, for Messrs. J. Fieldus, Son, and Co. Mr. T. Lainson, architect. No quantities:—

Howard, Geo. (accepted)	£7,845	17	8

Bournemouth.—For surface draining for the Queen's-road and the Cambridge-road, for the Bournemouth commissioners. Mr. G. R. Andrews, surveyor. Quantities supplied:—

Saunders & White, Bournemouth	£217	0	10
Pond, Wimborne (accepted)	195	0	2
Hoare, Bros. & Walden, B'mouth	117	6	4

(Surveyor's estimate, £224.)

Bristol.—For new road and sewers at Clifton Wood, Bristol, for Joseph Bartlett, Esq. Mr. Herbert J. Jones, surveyor:—

Humphreys	£535	0	0
Yalland	447	0	0
Johnson	424	12	0
Cowlin and Son	395	0	0
Mereweather	390	0	0
Krauss	390	0	0

Bromley, Kent.—For an addition to the porter's lodge at Bromley workhouse:—

Warr, Croydon	£64	0	0
Wood, Greenwich	45	0	0
Lowe, Chislehurst	38	0	0
Gascoyne, Beckenham	32	0	0
Payne, Bromley	32	0	0
Penfold, Sydenham	27	11	0
Balding, Bromley	27	0	0
Laslett, Farnborough	26	10	0
Haismen, Cray (accepted)	25	0	0

Clapton.—For erection of All Souls' Mission House, Overbury-street, Clapton Park. Mr. Francis T. Dollman, architect:—

Perry and Co.	£2,550	0	0
Boyce	2,529	0	0
Dove, Bros.	2,475	0	0
Outhwaite and Son	2,470	0	0
Shurmur	2,448	0	0
Lawrance	2,404	0	0
Hunt, J. R.	2,381	0	0

Clapton.—For soup kitchen and boundary wall, All Souls', Clapton Park. Mr. Francis T. Dollman, architect:—

Perry and Co.	£308	0	0
Boyce	263	0	0
Outhwaite and Son	260	0	0
Dove, Bros.	245	0	0
Shurmur	243	0	0
Lawrance	241	0	0
Hunt, J. R.	228	0	0

Coatesbach, Leicestershire.—For alterations and additions to Cotesbach House, for Charles Marriott, Esq., J.P. Contract No. 1:—

Parnell and Son, Rugby	£800	0	0
Herbert, H. H., Leicester	720	0	0
Law and King, Lutterworth*	680	0	0

*Accepted.

Devonport.—For effecting alterations at Rocky-hill, for the town council:—

Street, Devonport (accepted)	£110	0	0

[Lowest of four tenders, the highest being £344.]

Lowestoft.—For works at the beach outlet, for the improvement commissioners:—

For iron pipes:—
Spittle, J. (accepted) ... ... £5 15s. per ton.
For Memel timber:—
English, Bros., Wisbech (accepted) 1s. 4½d. per foot.
[Total Estimated outlay, £5,000.]

Dublin.—For laying a 15in. water-pipe from Stillorgan reservoir along the roadway to Dundrum, a distance of 5,734 yards, to supply the township of Rathmines, for the Dublin town council. Mr. Parke Neville, city engineer:—

Cochrane, Grove, and Co. (accepted)	£10,500	0	0

[Lowest tender received.]

East Dereham.—For works in connection with the waterworks, for the local board:—

For brickwork, for water shaft, chimney, stores, and fence walls:—

Hubbard, W., East Dereham (accepted)	£1,582	0	0

For construction and erection of cast-iron water-tank and girder in the said tower:—

Pearse and Knowles, Coal and Iron Co., Warrington (accepted) £495.

Edgware-road.—For roads and sewers on the Oak Lodge Estate, Edgware-road, the property of the United Land Company (Limited), including Aberdeen granite curb:—

Watts, W. H.	£5,910	0	0
Pizzey, J.	4,545	0	0
Keeble, F. W.	4,474	0	0
Boyer, W.	4,392	13	0
Cooke and Co.	4,310	0	0
Bell, J.	4,282	0	0
Crockett, W.	4,258	0	0
Nowell and Robson	4,226	0	0
Thompson and Son	4,149	0	0
Mears, J.	3,610	0	0
Killingback, C. (accepted)	3,598	0	0

Finchley.—For the supply of 4,000 tons of Enderby granite, for the Finchley local board:—

	Per ton.	
Jones and Fitzmaurice	12s.	8d.
Dodd, H.	12	4
Nowell and Robson	12	4
Mowlem and Co.	12	2
Brooks and Co., Finchley (accepted)	12	0

Hoxton, N.—For alterations to a school in Church-street, Hoxton, for the London School Board:—

Boyce, T.	£746	0	0
Grover, J.	746	0	0
Sargeant, J. F.	737	0	0
Cox, C., Commercial-road, E.,*	715	0	0

*Accepted.

Hull.—For raising the tower 18ft. at Springhead water supply extension works, for the Hull town council. Mr. D. Maxwell, engineer to the council:—

Musgrave, B.	£240	0	0
Coulson, G.	207	0	0
Sergeant, R.	168	0	0
Southern, T. (accepted)	161	15	0

Fulmodeston.—For new church at Fulmodeston, Norfolk. Mr. William Smith, 10, John-street, Adelphi, architect:—

Rust, Norwich	£2,430	10	0
Brown, Lynn	2,099	0	0
Hubbard, Dereham	2,092	10	0
Chapman, Hanworth	2,053	0	0
Cornish & Gaymer, N. Walsham*	1,994	0	0

* Accepted.

Herts.—For additions and alterations to house and stables, "Cuckmans," St. Stephen's, near St. Alban's. Mr. James N. King-Church, Southampton-street, Bloomsbury, London, architect. No quantities supplied:—

	House.	Stables.	Total.
Rayment and Son, Hertford	£425	£257	£662
Battley, London	337	327	664
Waterman, G. and J. Watford	378	220	598
Miskin, St. Alban's (accepted)	349	227	576

Battley afterwards corrected his tender for stables to £227.

High Wycombe.—For restoration and enlargement of Little Market House, High Wycombe, Bucks. Mr. Arthur Vernon, architect, 26, Great George-street, Westminster, and High Wycombe:—

Woodbridge	£640	0	0
Lacey	559	9	0
Taylor and Grist (accepted)	520	0	0

Hove.—For the construction of two concrete groynes on the old front, for the Hove town commissioners:—

Cheeseman and Co., Brighton (accepted)	£4,440	0	0

Knighton.—For the erection and completion of new house and stables at Knighton, near Leicester, for Mr. G. H. Ellis. Mr. Edward Burgess, architect. Quantities by Mr. W. Thornicraft:—

Mayor, Y.	£5,640	0	0
Foundations and bricks	860	0	0
	£6,500	0	0

Leicester.—For the erection and completion of new board schools in Hazel-street, Leicester, for the Leicester school board. Mr. Edward Burgess, architect. Quantities by Mr. W. Thornicraft:—

Kirk and Randall	£8,560	0	0
Bland, T. and Son	7,739	0	0
Herbert, T. H.	7,607	0	0
Hutchinson, J. and Son	7,059	0	0
Clark and Garrett	7,019	0	0
Kellett, J. C.	6,959	0	0

London.—For rebuilding No. 1, Monument-yard, Fish-street Hill, City, for R. Davis, Esq. Mr. W. Smith, architect. Quantities supplied by Mr. E. J. Pain, 19, Buckingham-street, Strand:—

	Including party wall.			Deducting party wall.		
Seiler	£6,538	5	6	£6,5 8	5	6
Dunford & Langham	5,639	0	0	5,246	2	0
King and Sons	5,615	0	0	5,217	0	0
Harper	5,256	0	0	5,031	0	0
Crabb	5,148	0	0	4,918	0	0
Burman	5,100	0	0	4,771	0	0
Anley	4,620	0	0	4,195	0	0
Shurmur	4,590	0	0	4,265	0	0
Larke and Son	4,570	0	0	4,190	0	0
Steele, Bros.	4,490	0	0	4,185	4	0
Mattock, Bros.	4,377	0	0	4,120	11	0

London.—For girls' middle-class school, Chenies-street, W.C. Messrs. Davis and Emanuel, 2, Finsbury-circus, City, architects. Quantities by Mr. Fredk. Downing, 7a, Whitehall-yard:—

Cubitt, W. and Co.	£7,994	0	0
Holland and Hannen	7,937	0	0
Lucas, Bros.	7,916	0	0
Trollope and Sons	7,743	0	0

London.—For the erection of a pair of villas in Norwich-road, Stratford, E. Mr. J. Moore Smith, architect, No. 121, Bishopsgate-street, E.C., and at Stratford, E.:—

Gentry, Mark	£2,905	0	0
Heiser, H. G.	2,854	0	0
Waterman, T.L.	2,775	0	0
Webb, J.	2,749	0	0
Martin, W. H.	2,539	0	0
North, Bros.	2,475	0	0
England & Thompson	2,372	0	0
Crispin and Tomlin	2,223	0	0
Cheffins, J., Stratford (accepted)	2,150	0	0

London.—For proposed alterations and additions to the Exeter Hall, Strand, exclusive of large hall. Mr. Alfred R. Pite, architect, 44, Bloomsbury-square. Quantities supplied by Mr. Joseph Rookwood:—

Kirk and Randall	£12,880	0	0
Condor	12,695	0	0
Brass	12,485	0	0
Chappell	12,353	0	0
Booth and Sons	11,980	0	0
Patman and Fotheringham	11,845	0	0
Braid and Co.	11 800	0	0
Nightingale	11,598	0	0
Hobson	11,470	0	0
Higgs and Hill	11,120	0	0

(Architect's estimate, £12,000.)

Maidenhead.—For new tavern, Maidenhead, Berks. Mr. Arthur Vernon, architect, 26, Great George-street, Westminster, and High Wycombe, Bucks:—

Silver and Son	£1,448	0	0
Woodbridge	1,383	0	0
Loosley	1,300	0	0
Hunt (accepted)	1,195	0	0

Millom-in-Furness.—For the erection of a bridge over Haverigg-pool, for the Millom local board:—

Dodd, J. (accepted)	£170	0	0

THE BUILDING NEWS.

LONDON, FRIDAY, OCTOBER 29, 1880.

DAIRY HOMESTEADS AT THE DAIRY SHOW.

THIS year fewer competitors have responded to the invitation of the British Dairy Farmers' Association than last year, only four having entered the lists. Three prizes were offered, and the conditions required designs for a dairy homestead for 50 cows. Drawings had to be coloured, and the scale was not to be less than 8ft. to the inch, and details of ¼in. A specification and estimate had to accompany each set. In examining the four designs, there can be no doubt but that the judges have fairly awarded the silver medal and £15 to the design marked "Shorthorn" (Mr. Richard Waite, architect, Duffield, Derbyshire), the author of which has evidently shown judgment and good taste in the disposal of his buildings. It will be remembered that Mr. Waite was winner of a special prize in the last Exhibition, and has taken other silver medals. See BUILDING NEWS, p. 580, Vol. XXXVII.

In the plan of "Shorthorn," the principal merit of which is compactness and economy, avoiding long tramways, the tie-up stalls are in two double byres, side by side, each 42ft. long and about 27ft. wide, placed on the west side of the area, each having a feeding-passage in the centre and in direct communication with the food-preparing sheds, which are placed next the stackyard on the north side. On the south side, sheltered by the cow-stalls on one side and by the implement-shed on the other, is the covered yard for young stock, 42ft. by 43ft. This area is partly covered to the extent of 25ft. from the back, and is roofed in two bays, supported by a row of cast-iron columns in the centre. By this arrangement, the objection made by some farmers to covered yards, that they reduce the hardiness of the cattle, has been met. The details of Mr. Waite's plan are also noteworthy. We find, for instance, that there is a central feeding-passage 6ft. wide between stalls, six stalls in each row 7ft. wide; the calving-boxes, 14ft. by 10ft. each, have also two doors, a feeding one besides an entrance to cow-stalls; the mixing-room is convenient to the root store and stalls, and by a judicious arrangement the stall divisions are so constructed as to give free ventilation, and to provide easy means of feeding from the central passage between the lower rails. These rails, or battens, are fastened by screws, and can be raised or lowered, and each headpost to the divisions is cast with flanges to receive the battens—a plan at once economical and sanitary. Then we find all the doors are hung in two heights; the loft over mixing-room is obtained under a wide roof with skylights at the side, the purlins being trussed; and ample ventilation is secured by louvred skylights along the ridges, combined with openings running along the roof and overlapping eaves. Another feature in the author's section is the improved kind of trough, made of blue bricks, which prevents waste of food; the drinking-troughs are raised, and the author prefers to supply them by pipes from a higher level. Covered gangways surround the yard, and the drains are well detailed. The dairy is not far from house and cow-stalls; moderate stabling is provided, and the author appears to have solved the problem of providing for 50 cows by bringing all the departments in close relation, so as to avoid tramways and expensive walling. The estimate is £1,300 for homestead and piggeries, and £900 for the house. Externally the buildings are in red-brick and slate, with partially-tiled farmhouse, and a clever ink perspective, drawn by Mr. Lethaby, accompanies the set.

The second prize, of £10 and a bronze medal, has been awarded to a set of plans under the motto of "Nero," by another former successful competitor, Mr. Gilbert Murray, Elvaston Estate Office, Derby. The plan we have illustrated, so we need hardly add to our previous remarks upon it, though in justice to the competitors we may observe the design shows provision for 80 cows and 40 young cattle, and thus exceeds the requirements of the committee. Possibly they had in view the *principle* of planning, in giving the second prize to the design, which is arranged on the double quadrangle system, with two covered yards, separated by a wide cow-house, with a double row of stalls, and two parallel blocks, one occupied partly as stabling and implements, and the other as piggeries and cow-sheds; these three buildings being united on the north side by the food-preparing, waggon, and cart-horse sheds. The only objection we have to make to the plan, as carrying out the present requirements, is that the tramways are long, and the corner turnings awkward. The buildings and yards are covered by a series of five parallel roofs, with round skylights, supported in the yards by cast-iron columns; there are footpaths on the shed sides of the yards, and the details are carefully shown. The section shows iron tie-rods, and struts with timber principals, and the cost is estimated at £2,706.

"Once Again" is the work of another practical homestead builder (Mr. Thomas Potter, Grange-park, Alresford, Hants), whose plan on the last occasion we illustrated. Mr. Potter has been less successful this time; the plan covers a larger area than necessary, and we find the whole length occupied by the buildings is 224ft. The main feature in the plan is a through roadway between the stables, piggeries and food-preparing house, and the cow-house; the latter is placed with an open yard and covered shed on the south, the former measuring 97ft. by 35ft. Cow-boxes form short buildings on either side, and stalls for 52 cows are shown, with a centre tramway running through the cow-house, and continued to the milk-room on the east side. The arrangements of the dairy are good, and there is a useful courtyard between the dairy on the north side and house on the south. We also consider the shed on one side the yard, covering about a third, is a desirable feature, and practically it amounts to a partly-covered area. The details are well considered, and an isometrical perspective in ink is sent in, showing plain buildings with slated roofs. An elaborate set of notes, specification, and bill of quantities accompany this set, in which the author alludes to the old homesteads built to suit the ideas of several successive tenants, and to the regret felt in losing so much that is picturesque, which we share with him. The external treatment is unpretentious and suitable. Estimate, not including house, dairy, and outbuildings, is £1,089 9s. 8d.

A monogram "M. C." (by Primrose McConnell, Lymm, near Warrington) distinguishes another set of drawings, though the author has, by adopting his own initials, disqualified himself. The plan indicates a practical acquaintance with homestead construction. The byre for 48 cows has two feeding-passages, with food-house and barn at one end. The stables adjoin the byre along one side, with piggeries on the other, and a large yard is obtained. The dairy is in direct communication with the food-preparing house and byre, and the cart-sheds form a separate range. The upper sties are utilised for calves. The cattle are fed from trucks running on wheels, and the troughs are shown to project into feeding passage. The section shows a loft supported by iron pillars over the byre, the dungstead forms a lower building on one side of the byre, and the details are practical. We cannot say we think the location of the cow-house, in reference to the other buildings, economical. The plans, though extremely neat, are feebly executed, and a perspective is sent in which does little justice to the design, clearly executed by some one who did not understand isometric projection, as the walls are not shown vertical, but are twisted round so as to make the chief lines conform to the paper. It is to be regretted that the conditions published by the Committee are so indefinite. In this instance no instructions as to area of land, locality, or levels were furnished, and we are sure that a more satisfactory competition would be the result if conditions were assumed or the Committee supplied a small scale plan of a site from Ordnance Survey, with the situation and levels marked, so that the competitors might work from actual instead of imaginary data.

THE RESCISSION OF BUILDING AGREEMENTS.

HOWEVER carefully and cautiously the clauses and conditions of a building agreement may be drawn, disputes will continually arise as to their application under certain states of fact. It seems easy enough to the unthinking to put down upon paper a string of provisions which will meet every possible combination of circumstances. But even when the agreement is so cleverly conceived as to be thus all-embracing, there remain the construction of its various terms, and the consideration of the way in which the powers given thereby to each party can be enforced against the other. Thus it comes that many contracts have been brought before our courts of law, not so much because they were ill-drawn or incomplete, as that difficulties arose as to their application in the tangled state into which the facts had fallen. A case of this kind lately came before the Chancery Division, which is most instructive reading as an example of what frequently happens when the parties fall out and go to law over their agreement. In "Marsden v. Sambell" (43 *Law Times* Rep. N.S. 120) both sides were, as usual, somewhat in the wrong, though, of course, each thought himself absolutely right. The facts were very similar to the common run of such disputes, and, as several legal points of practical utility were made plain by Mr. Justice Fry in the course of his judgment, we propose briefly to direct attention to the effects of this decision, and their general application.

The agreement entered into between the employer and the contractor provided that the latter should completely finish for habitation certain houses then in carcase by the 24th day of June; and it was mutually agreed that, in all things, time should be of the essence of the contract. Under one of the clauses the builder was not to remove any of the materials brought by him upon the premises without the written license of the employer or his surveyor; while, in a cumbrous and complicated clause, a right of entry was given to the landlord in case of the builder's failing to finish the houses as agreed, or breaking any other condition of the contract. Money was duly advanced in the usual way, but the houses were not completed by the 24th of June, in consequence, according to the builder, of the bad weather. On the 27th of June, however, the employer made a further advance of £15 to enable the contractor to pay his men, and this latter went on with the works without any interference from his employer, notwithstanding the non-completion of the houses. But, upon the 5th of July, a man who was engaged upon property close by, was asked by the landlord to "keep his eye on" the builder, and he did so, while the work went on, down to the 25th of July, when it was stopped in consequence of a claim made by the employer, at an interview with his contractor about the 15th of July, that the premises were forfeited to him from the preceding 24th of June. Upon the 31st of July the builder, against the will of the caretaker, entered upon the premises, and removed a quantity of building materials, and, again, on the 26th September he did the same thing. The employer then brought his action, claiming a forfeiture as from the 24th June, carried into effect by his appointment of the man whom he had asked to look after his property, and further claiming, as an alternative, that if this forfeiture had not been effected, or had been waived, then that the removal of the materials was a fresh forfeiture. He therefore prayed an injunction against the defendant contractor to restrain him from trespassing upon the premises, and for damages. To this the defendant pleaded that the forfeiture had been waived; that the time of completing had been verbally extended, though this fell through for want of evidence; and that he did not know the terms of his own agreement, with other matters equally useless and beside the point.

Now, there are no less than four different and distinct questions to be answered in this case, questions, too, that must be of constant occurrence in disputes upon building agreements. In the first place, there had been a clear breach of the contract upon the defendant's failure to complete the houses within the time stated: and there was thus a forfeiture of which the plaintiff could take advantage and rescind the contract altogether. But then came the query, Had not the plaintiff waived that forfeiture by his own conduct? It is both law and common sense that a man cannot have a thing both ways. When the defendant's failure to complete in time happened, then the plaintiff had a right of entry. He must, however, act upon that right or waive it; he must at once elect to do either one or the other. Here the employer not only advanced money after the forfeiture, but he allowed the builder to go on as before. Then when he did take action, he merely asked some one to give an eye to the affair. In neither way had he complied with the law. It seems that, even now, at what time the right to avoid a contract is legally lost, remains still doubtful. But, upon the authorities, a man must elect to do so within a reasonable time afterwards, or, at all events, before the other party has been induced to alter his position on the faith of its continuance. In this case the plaintiff was wrong all round. Having the right to avoid the contract and claim the forfeiture on the 24th June, he made no election until the 5th July, which was an unreasonable delay. Even then, moreover, he did not signify his election to rescind in a plain and unqualified manner, by taking possession of the premises as he was entitled to do, and should have done. The plaintiff was still more wrong in allowing the defendant to go on with the work after the forfeiture, and so change his position; and this alone would have prevented his successfully claiming under the first forfeiture.

But, upon the other part of the case, the defendant's conduct was equally erroneous and illegal. For if the contract was subsisting, then he had no right to remove the materials as he did, and upon these breaches of the agreement a forfeiture followed. Seeing this dilemma, the defendant's counsel strove to argue that the contract had been put an end to by the plaintiff himself at the interview upon the 15th July, and here, he, in his turn, wanted to have things both ways. But though ingenious, this view was held by the judge to be untenable. From this aspect of the case the defendant also had failed to make his election at the proper time. It is true that the plaintiff's refusal to treat the contract as subsisting gave him good ground to rescind it then and there; but he had omitted thus to claim its rescission, and had himself gone on doing work under it and treating it in all things as subsisting. He could not, therefore, turn round afterwards and say he wanted it the other way. Nor was the defendant's last point of any value. Claiming to have rescinded the contract himself, he founded upon that a right to remove the materials from the premises. But the judge ruled otherwise, according to clearly-established law, and so, even upon this supposition, there was an end of the defence. Mr. Justice Fry then held that the removal of materials without plaintiff's permission was a breach upon which forfeiture followed, and he accordingly granted the injunction asked with £30 damages and costs; the defendant being so wholly in the wrong as regarded the latter part of the controversy between the parties.

The great principle at the root of this, and many preceding decisions, is that a man must act uprightly and at once; and that the law will not allow him to blow hot and cold, and have things both ways. Had not the defendant behaved so unwisely in seizing the materials, the plaintiff would undoubtedly have lost his action upon the first point. For, although the defendant had by his breach of contract in not finishing the houses as agreed brought himself within the clause as to forfeiture, the plaintiff had lost his right to claim it and avoid the contract by the dilatory and uncertain way in which he had acted afterwards. A man who means to claim his legal rights must do so in a plain and straightforward manner. Here, as elsewhere, the law will not encourage any delay, neither will it allow one to prejudice another by pursuing a course of conduct which may induce that other to alter his position for the worse. These are simple and elementary principles of justice, and in this last case they were, curiously enough, called into action by both sides of the dispute. For the defendant also tried to turn round and go back from his original standpoint. The moral of the whole dispute is one of very general application. It is merely that men of business should act in a business-like manner, and both abide by, and carry out, the terms of all agreements into which they may enter. The day has gone by when little tricks and technicalities will succeed in defeating justice in our courts of law. At one time the art of playing fast and loose with clauses and conditions of contracts was brought to a state of high perfection, by long practice, amongst certain acute lawyers. In these matters, however, we are now under the guidance of equitable doctrines, and one of the greatest of these is, that "He who seeks equity must do equity." No one who acts upon contracts by the light of this motto will fail to come out successful, whatever may be the dispute in which he is engaged, or the court in which he is made a party, especially in regard to the rescission of contracts, where so much depends upon the conduct of individuals.

BARRY'S PICTURES IN THE SOCIETY OF ARTS.

NOT many besides the members and visitors of the Society of Arts, John's-street, Adelphi, are probably aware of the fine pictures which adorn the upper part of the walls in the meeting-room of that institution. They had become very dirty, and few even of those who were wont to attend the meetings and congresses of the Society were disposed to examine them. The coating of dust and dirt had, moreover, obscured the painting: it looked dull and colourless, and the lighting did not add to the effect. We think, therefore, the council of the Society wisely undertook the process of cleaning. Mr. H. Trueman Wood, the secretary, in his interesting description of the pictures, says—"The amount of cleaning which has been bestowed upon them has been only sufficient to remove the accumulation of dirt which, in the course of the past 17 years, has gathered upon them. The work has been very successfully carried out by Mr. F. W. Andrew, the chief repairer in the South Kensington Museum. The pictures have been merely washed over, and nothing has been done to them which would, in the slightest degree, affect their surface." Our inspection of the pictures bears out Mr. Wood's statement. Few will say the pictures have not repaid for the cleaning. The removal of the dingy brownish coating of soot has revealed the colours to a greater extent than we had anticipated; there is a brilliancy in some of the groups which, as Mr. Wood says, will surprise those who knew them in their recent condition.

Mr. Wood furnishes a few descriptive notes of the pictures of James Barry, prefaced by an account of the painter himself. Born at Cork in 1741, Barry, it seems, early gained the notice of Burke, who gave him an allowance of £50 a year to visit Rome. His first picture exhibited at the Royal Academy was the "Adam and Eve," now belonging to the Society. In 1774, when the Society moved into their present house, they resolved on the decoration of the great room; and eight artists were asked to compete upon the condition that they should paint each an historical picture, and two others were invited to send in allegorical subjects, it being understood that the pictures should be exhibited, and the profits distributed among them. The historical painters were Angelica Kauffmann, Sir Joshua Reynolds, West, Cipriani, Dance, Mortimer, Barry, and Wright; the allegorical painters, Romney and Penny. The invitation was met with a refusal, owing, it is said, to Sir Joshua Reynolds; but in 1777, Barry authorised Mr. Green, the engraver and member of the Society, to inform the council that one of the Royal Academicians was willing to take the whole work upon himself, and to decorate the great room with a "series of pictures analogous to the views of the Institution." This offer was accepted by the committee, and upon opening the letter, it was found the offer had been made by Barry. The cost of canvas and colours was estimated at £100 and a further expense of £30 for models, which the artist offered to pay, but which was eventually paid by the Society. It was decided to paint eight historical pictures and two allegorical ones. Barry commenced his task, it is said, with only sixteen shillings in his pocket, and supported himself while it was in progress by etching. By 1778, the pictures were well advanced, and in 1781 the artist was allowed the entire use of the room. An exhibition of the pictures took place in 1783, after they were finished, for the painter's benefit, and the proceeds amounted to £503 12s. Praise poured in upon the artist; but he complained bitterly of the want of taste on the part of the public, and died at last in miserable circumstances.

A description of the pictures is given in Barry's work; but Mr. Wood furnishes an explanation of the subjects represented. The series is intended to illustrate the maxim, "That the obtaining happiness, as well individual as public, depends on cultivating the human faculties." The first picture shows mankind in a savage state; the second represents a harvest-home or thanksgiving to Ceres and Bacchus; the third the victors at Olympia; the fourth Navigation; the fifth, the Distribution of Rewards by the Society; and the sixth, Elysium, or the State of Final Retribution. On entering the room the first picture is on the left hand on the west side, and represents Orpheus explaining the advantages of culture to a group of savages; the compositions and mountainous background are masterly. A Grecian harvest-home on the second half of the wall shows a landscape, in the foreground of which maidens are engaged in a dance; it represents the second or agricultural stage of civilisation. On the wall facing the entrance is certainly the grandest composition; it occupies the whole length of wall, and is entitled the "Victors at Olympia." On the right are a group of victors receiving prizes from the judges. Two of the athletes are seen carrying an old man, Diagoras, their father. In another group, Pericles, with the face of the Earl of Chatham, is depicted, and above is a view of the Parthenon. On the left hand is a chariot, with Hiero of Syracuse, forming a separate group; and at either end are statues of Minerva and Hercules, while at the feet of the latter sits Barry, the painter. This pictures combines the poetic and historical elements. The fourth picture on the east wall called "The Thames," is typical of modern commerce and navigation. A figure emblematic of the Thames is seated in a car drawn by illustrious navigators, Drake, Sir Walter Raleigh, Cabot, and Captain Cook; while figures representing Europe, Asia, Africa, and America, are in front. Following the car are Nereids, the sportive appearance of some of them being suggestive as showing that extensive commerce is "sometimes subversive of the foundation of virtue." In the midst of the sea-nymphs the painter has shown Dr. Burney, as a personification of Music—certainly a ludicrous introduction, a whim, as one writer calls it, which no raillery or good counsel would induce Barry to dismiss from his canvas. In the background is a tower or lighthouse, and a figure of Mercury is shown at the top. The fifth picture, occupying the same wall, represents "The Society," and is crowded with personages connected with it, among them Lord Romney, the president, William Shipley, the originator, and other officers, Mrs. Montague, a beneficent patron, and a host of other celebrities. Over the entrance is Elysium, or the State of Final Retribution, a remarkably fine canvas, crowded with figures representing the great men, philosophers, navigators, poets, and painters of all time, in which composition, however, we see that the unities of time and place have not been preserved, as we find Thales and Archimedes in the same group as Roger Bacon and Sir Isaac Newton and Columbus. These figures have been arranged to classify the different orders of genius. In the lower right corner, the artist has depicted Tartarus and a fiery gulf, wherein figures personating War, Gluttony, Cruelty, and other vices are seen entwined by serpents. West and Mulready at different times have reported on the condition of these pictures; the Society have had the frames regilded, the canvases were re-lined and stretched; but the present recleaning has brought out the long-hidden beauties of colour. On the staircase are a number of etchings by Barry and the Society possess etchings of the six great pictures on the walls. Admirers of grand historical composition and vigorous etchings will be well repaid by a visit to the Society's rooms, which contain the most important of Barry's works.

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Mr. Bell has been appointed surveyor and inspector of nuisances to the urban sanitary authority of Cockermouth.

A RECENT VISIT TO RUSSIA.

(Continued from page 379.)

THE CHURCHES.

THE churches in the Chinese town, or trading quarter of Moscow, are truly national. These, with the exception of the one dedicated to St. Basil, have been rebuilt since the fire of 1812. The old walls in these cases must have been reused as far as they held good, for one of their number, standing near a gate or entrance into this internal city, is said to be the work of Peter the Great—a statement that adds another hundred years to its history. These buildings are rough-plastered on the outer face, and set off with barbaric doors, windows, domes, and spires, many features of which are Indian mixed with others of a Saracenic type. The colouring indulged in is savage, and, as this detail is kept in first-class order, we come upon them as we turn the streets with somewhat of a shudder. Take, for instance, one with the walls a bright scarlet, relieved in the window-dressings, pilasters, &c, with white, bright green roofs, and white domes; another, Indian red, with white facings, and the domes and spires painted green. The whole of these build- are minor details compared with the

CHURCH OF ST. BASIL,

which occupies a part of the Great, the Red, or Beautiful square, an area that separates the immense cluster of bazaars from the Kremlin walls near the Holy Gate. As a building it is remarkable from the fact of escaping the great fire of the city and the carrying out of Napoleon's orders for its destruction by his artillery. This church was commenced by an Italian architect, to the order of John the Terrible, in 1550, as a thank-offering for the subjugation of the Tartar City of Zazan by Russian arms. Its site was the grave of St. Basil, a man whose only claim to canonisation was that of being an idiot, a "Simeon Stylites" of Moscow, who went bare-footed, carrying heavy iron chains and crosses as penance for "Christ's sake."

This church, which is introduced into most of the views of Moscow, is strange and grotesque in its details, being designed in an Eastern style, the leading features of which on the one hand are splendid, and on the other barbaric. Tradition, that lies so often, says the king was so pleased with the work of its architect that he ordered his eyes to be put out, with the view of rendering him incapable of excelling or surpassing the beauty of this church. The plan of the nave is square, and in the centre, carried on the orthodox four columns, is a great spire-like pagoda of Indian or Tartaric design. The plan of this feature, which terminates with a necking of ornament, surmounted by a bulbous dome, is octagon, and the enrichments are strings and circular gablets, richly interlaced and crowded with gold and colour. At the four corners of the nave, the seats of which are affected by the octagonal form of the central tower, rise other pagodas or minarets, the base of which are circular gablets, the short shafts being pierced with narrow lights, and the whole crowned with highly-enriched bulb-shaped domes. These are covered with scale-like shingles, or with interlacing bands, the squares being sunk and pointed, or ribbed, the line of the same being perpendicular, or twisted after the manner of an Indian's turban. Built as a lean-to on every side of the nave is a two-story erection, the details of which are Italian: the lower stage is a part-blind and part-glazed arcade; the higher one, which resembles a stately gallery, is a series of upper chapels. The centre of each of these faces is cut by an octagonal tower, the lower part of which is uniform with the adjoining buildings; the upper, which rises in two important stages, is enriched with cornices, loop-lights, and steep-pointed and circular gablets. These four towers, the one covering the eastern chapel being the largest, are covered with great bulbous domes, one being enriched with pointed squares, in which respect it resembles a pine-cone; the others being ribbed either in perpendicular or twisted line, the latter not a form to be admired, as it reminds one of the old spire of Chesterfiled Church. The metal-work of these domes is not of the best; the lines of the rounded ribs are not smooth and uniform. They are a series of cants or angles, the natural result of being worked in sheet iron. To those with a correct eye in details of construction, this cluster of domes is not pleasing, from the fact that they are in part out of the true perpendicular. Completing the domes and spires, which up to this point are nine in number, we have two small domes, on the eastern angles of this lean-to construction, and two low spires over the western corners, the latter marking the porches or entrances into the church. Occupying a central position in the east face is a chapel crowned by a bell-tower of octagonal form, capped with an ordinary spire. This tower is pierced on each face with a large arched opening, in which numerous bells are hung, the openings being repeated in three tiers of spire lights, which gives the whole a very light and aërial effect. The walls of the entire building are of brick, faced with plaster, and by way of ornament they are overlaid with raised joints, the object of which is to give the fabric the appearance of being constructed of rubble-masonry. The groundwork in this case is coloured in imitation of stone, and the joints are finished red. In the spandrels of the second tier of windows, rude ornaments, illustrative of foliage springing from pots or vessels, are introduced; these are worked in the same plastic material, and highly coloured. The reader, from this description of the parts of this remarkable church, will form some idea of its strange outline; but he can form none of its decoration, which embraces the whole of the primary, and no few of the secondary colours. The effect of this colour is heightened by a lavish expenditure of gold in the domes and other conspicuous parts. The interior is in one way different to the churches we have already visited, its most marked feature being a great number of small chapels, and other apartments. As we find nothing further of special interest in this innermost part of Moscow, we will pay a visit to the open spaces abutting upon the outer face of the walls. These, two in number, are

THE WINTER MARKETS.

One has a large circular conduit in the centre, which is a busy spot for the water-carriers, who come here by hundreds with their casks fitted on sledges; these latter, from the leakage of the casks, are one mass of ice disposed in fantastic and fairy forms. These winter markets follow upon the setting in of the long frost, when an immense stock of fish, flesh, and fowl is killed off, and at once exposed to the biting atmosphere, upon which it assumes a form that it maintains all through the winter—one which enables it to travel, as it often does, upon sledges for a thousand miles without sustaining any damage. Here may be seen piles of frozen fish from the White Sea, carcases of deer from Northern Siberia, sheep from the shores of the Caspian Sea, and oxen from the Crimea. The bulk of the people in and about the cities of Russia take advantage of these great frozen markets, and lay in vast stores of food, to meet domestic requirements during the long winters. This curing of food by frost is a system strongly reflected in that of curing by salt, a custom common to the Teutonic people. We mention this fact because it gives us a graphic illustration of the climate of Russia, and it throws a powerful light upon the conditions under which the building and other trades of the country are pursued.

Abutting upon the largest square are two of the many

THEATRES.

It is exactly a century since the Drama on the European system was introduced into Moscow by the building of a theatre; this was the work of an Englishman of the name of Maddox. The smaller of the two theatres under notice, an establishment devoted to the Russian drama, is capable of seating 500 persons; but as this building possesses few details of interest, we will pass on to the larger one, which may be called the "Imperial Italian Opera House." This building, which is Imperial property, has an imposing façade, not unlike that of our Royal Exchange, except that the shafts are not fluted. The building is of brick, plastered on the face, and coloured a pale red. The columns ranging along the front are of sandstone; but, strange to say, these are coloured in the same manner. We were curious about the quarries from whence these blocks were hewn; but we were not fortunate enough to satisfy ourselves. Our guide, a most intelligent gentleman, who was born in the city, but who learnt the English language in America, assured us it was a material introduced in the city from Finland, being brought up from the north by the railway; but our guide-book (Murray's) assures us there are extensive quarries of this sandstone in the neighbourhood of Moscow. The present building, which dates from 1852-1856, is capable of accommodating an audience of 1,500 persons, and some idea may be formed of its size from the fact that it is furnished with six tiers of boxes. The origin of this theatre was the burning of an older one that occupied its site, an event that occurred in 1852.

The next most important edifice is the

GREAT RIDING-SCHOOL,

a large but plain building situate a few hundred yards to the east of the Kremlin. Prior to the construction of the St. Pancras station by the Midland Railway Co., this was the largest covered space, unsupported by central pillars, in the world. Its internal length is given as 560ft. (four-fifths of St. Pancras station), and its width as 158ft. (two-thirds that of St. Pancras), the height of the flat ceiling being 42ft. The framing of this enormous roof is of wood, and it is described as a forest of beams and rafters above the level of the ceiling. We were not fortunate enough to inspect this remarkable specimen of Russian carpentry, as a special order is required before a visitor can be admitted to the roof, nor were we able to see any drawings or sections of the same. The object of this building is to furnish a covered space for the exercise of troops, when the cold is so intense as to render the operation impossible in the open air, the area being sufficient for the accommodation of two regiments of cavalry.

The ornamentation of the interior consists of sundry bas-reliefs, consisting of men in armour, warlike trophies, &c., and the heating or warming is carried out by something like twenty porcelain stoves fixed along the walls. These are of great size, and rise nearly to the level of the ceiling. During our visit to Russia in December last, we witnessed the coldest period of the year when the temperature sank to 20 degrees of frost (Reaumur)—11 degrees below zero, and we saw the provision made by the military authorities for the sentries in such a temperature. As this has a bearing upon the building under notice we make free in giving details of the same. The soldier has on his ordinary winter clothing of cloth, and the long-skirted grey overcoat; over this he has a dark cloth cloak lined with sheep's wool, even to the ends of the sleeves. On his feet he has a pair of clogs lined with felt; round his neck he has a brown cloth hood with ends a yard long; these ends he wraps round his neck in the form of a scarf, the hood itself being on his back or drawn over his head. His hands are buried in long felt gloves, tied with a band across the arm, and if he is exposed to a biting wind the collar of his outer-coat is turned up, an act that literally buries or obscures the head; in this guise he paces his beat, carrying his musket as best he may. The impression we form is that the first consideration of the military authorities is the care of the men forming the rank and file, or bone and sinew, of the army, and the very reversal of this detail shows how far short our authorities were in their reckoning when they sent our soldiers to winter in the Crimea.

In our next, we propose to visit the New Church of the Redeemer—the "St. Isaac's of Moscow," and to afterwards close our notes of travel in Russia with a few general remarks.

DECORATIVE FURNITURE AND HOUSEHOLD APPLIANCES.

AMONG the few establishments in the City where art-furniture is made—not the tasteless show-room inanities which often go under that name—is that of Messrs. Walker and Sons, of 119, Bunhill-row. The manufactory itself is an imposing building in size, but its interest lies chiefly in its completeness. Entering through an archway, we find ourselves in a large court-yard, on each side of which are the blocks—one devoted to the manufacture, and the other to the show rooms, while a large office, lighted from the same court at the end, is used as a draughtsmen's office, for we find Messrs. Walker employ their own artists. The ground-floor of the show-rooms is set apart for the larger and heavier sorts of furniture, such as wood chimney-pieces, sideboards, and other dining-room appointments. Messrs. Walker probably have here as large a collection of wood chimney-pieces as will be found anywhere in the Metropolis; not that we attribute any virtue to mere quantity in artistic work. Large stocks are often accompanied by inferiority in design and workmanship, and quality is oftener than otherwise in an inverse ratio to the quantity. But this is not the case with Messrs. Walker's show-room, for we find superior workmanship, unknown to many of the large manufactories in Tottenham Court-road, in almost every article, and this is found along with good design in very many instances. We notice a few handsome American walnut chimney-pieces, including overmantels in a style that would compete with many specially designed by well-known artists, varying in price from £30 to £60. These are generally of Old English design, varying from Jacobean to the later forms of Renaissance. In some of these the chimney-glass, set in a frame of American walnut, is made the principal feature, to meet the taste of customers, who have still a strongly-rooted prejudice for the chimney-mirror, while in others, the glass occupies but a small part of the space above the mantel-piece, and the sides are devoted to tiers of shelves for china. The display of mirror or faïence depends on something more than personal taste or vanity; a close, heavily-furnished apartment is often relieved and considerably lightened by a mirror; and with all our dislike for the gilded and tawdry splendour of the popular gilt "pier-glass," we may still discern correct taste in a moderate use of the mirror framed in the darker and more serviceable material. In this, as in other matters of taste, "extremes meet," and often lead to a common-sense moderation.

A very useful and cheap kind of chimney decoration is now manufactured, and we see a few neatly-made examples in these show-rooms. Let us take Nos. 787, 790, 791, and 795, in the catalogue. One of these consists of a low oblong panel of bevelled silver-plate glass with a narrow ledge or shelf above it, as well as the usual mantel-shelf; the splayed sides of mantel-piece may be decorated with tiles or merely carved. Another form is more broken in outline: the plate-glass panel is square or circular, and the woodwork above mantel is finished with moulded cornices, which form ledges for ornaments or bric-à-brac. A third is quite plain, without glass panel, and its price is £1 12s. 6d. Who would prefer the heavy console mantel-piece in marble to one of these useful chimney-pieces? Messrs. Walker provide for the drawing-room as well as the library or dining-room. Their walnut and gold chimney-pieces possess the merit of relief upon the dark material. In some the ornamentation was most simple, and was obtained by incised lines and carving on the surface, these being gilded. The inlaid cabinets in almost every form from what, in the trade, is called "Early English" to the style of the Adams Brothers, present enough variety to satisfy the most fastidious. Another speciality of this firm is the silk and wool tapestries with plush borders, a tasteful kind of covering for chairs and couches. We have no space to describe the ebonised drawing-room suites in the most unique styles, from Jacobean to the Georgian; the artistic joinery, another special branch of manufacture—doors, overdoors, wall-linings, dadoes, nor suites of bedroom furniture. The Hungarian ash veneered toilet-table with tile back, and the cant-sided wardrobe, the American light wood and walnut relief furniture, and the stoves with repoussé bronze cheeks, are well worth inspection by architects and others. Messrs. Walker are certainly setting an example in the way of good art workmanship to our colonies, whither they send large supplies of their goods.

Passing from furniture in which the raw material is wood, let us turn to other manufactures in which iron, terra-cotta, and faïence, have been brought into artistic combination. Messrs. Barnard, Bishop, and Barnard, of Norwich and Queen Victoria-street, the manufacturers of the well-known "slow-combustion stove," have an interesting show of stoves, mantel-pieces, woodwork, and other kinds of decorative furniture, which deserve an architect's attention. The construction of a stove that shall give out the largest amount of heat by radiation, require little attention, and shall, at the same time, limit the amount of smoke, is a problem that deserves the best consideration of the manufacturer and sanitarian. The increasing smokiness of London and other great coal-burning cities, is a subject growing every year and calling for urgent attention. Just now a joint committee of the National Health and the Kyrle Societies, held at the offices of the former body, in Berners-street, W.C., are engaged in investigating the subject of smoke-consumption, and propose taking evidence on the most desirable kinds of apparatus and fuel that shall limit the production of smoke. Messrs. Barnard and Bishop's slow-combustion stoves are a step in the right direction, and as it can be shown that this stove burns less coal by 50 per cent., it follows as a natural consequence that they throw out less smoke. Dense rolling volumes of black smoke are impossible by the use of stoves of this construction, and we believe if every householder in London were obliged to use them, 50 per cent of the smoke which now renders the winter season unendurable and vitiates our atmosphere would be saved. They are also clean, and fuel of any description can be burnt. Their construction is exceedingly simple. It consists of a solid basket of fire-brick, sloped at the back with bars in front, through which the air passes. A larger heating-surface is presented to the room, while a register door is provided to regulate the draught in the chimney. As artistic stoves they are far superior to the old "register grate," the fire-opening is rectangular, and the sides are splayed. In many, these are decorated with painted tiles; in others the splays are formed of cast metal of a pleasing Japanesque pattern. In some the tiles are introduced as a margin in the same plane as the stove-front. The mantel-pieces are of almost every description of wood, from satinwood to pitch-pine. Some of the painted chimney-pieces are unique; one we saw was of peacock-blue, relieved by lighter shades in the mouldings; the colour of the woodwork can be made to form a pleasing contrast with the Berlin black, brass, or bronzed fronts of the stoves, and many of the brass fronts with the reeded frame, and splayed sides filled with conventional ornament of tile or metal, have a highly decorative appearance. We must not forget to mention, in speaking of stoves, the "Diamond cooking-range" made by this firm; they are supplied from 18in. to 36in. in width. The smaller ones are about 12in. deep and 27in. high, and contain a wrought iron oven, shelves, damper, blower, wrought hinges, &c. The fire is contained in a solid fire-brick lining with the oven below it: they thus save room and economise fuel, as they are on the slow-combustion principle, and can be fitted in the usual brick fireplace, or be supplied in a portable form. Nothing could be better adopted for cottages than the 24-inch range we saw; the oven being below the fire, is of good size, and the whole can be introduced into a small opening. The price varies from 35 shillings upwards. We understand they are to be introduced in the New Lambeth Dwellings. Another speciality of this firm is their "slow-combustion mantel register stove." This is a complete stove and mantel combined, suited for the smallest fire openings, and we can recommend them for bedrooms, attics, and other purposes where a small fire is desirable. They are made 18 inches and 24 inches wide, with painted wood fronts, and are provided with open grated or solid fire-brick bottoms. The "jardinière" in cast-brass is a pleasing novelty. It is in fact a flower-box of metal, which can be hung on to the bars of a grate in summer-time when the fire is not in use. Decorative woodwork, over-mantels, &c., are another manufacture of which numerous specimens are to be seen here. The oak staircase leading from the lower to upper show-room shows a sensible variation upon the common wrought-iron balustrade. This is of solid oak perforated in panels of oval shape, and filled with wrought-iron scrollwork.

The principle of storing and radiating heat has been carried by some manufacturers farther than mere utilitarian considerations suggest; we instance the introduction of terra-cotta for the entire mantel-piece and fireplace, as those recently manufactured by Messrs. Doulton in red and buff terra-cotta. There is a decided advantage in applying terra-cotta in this way: it has not the objections that might be urged against wood as a material in close proximity to the fire; it is free even from those which might be made to stone or marble, and it moreover retains heat. In the open fireplaces of Messrs. Doulton, the fire is made on the hearth, kept in position by an iron hurdle; the sides are well splayed, and these are decorated with tiles or mosaic. Artistically, we think some of the designs a little too extravagant in decoration, to which the material readily lends itself; but architects have the material in their own hands. Perhaps a still more useful application of tile or glazed fire-clay is this firm's new "Radiating Tile Stoves." These are constructed in rectangular and other shapes, with tiles all round, and they have an enamelled slate top. In some, glazed fireclay corners are introduced. Decoratively they admit of almost unlimited variety: some have hand-painted tiles in buff, brown, and green glazes; others are in a quite plain tint, but almost any kind of modelled or painted decorations may be obtained. We might even hope for some improvement in form if not in colour: yet we are bound to say these stoves are preferable to iron for many purposes where little attention and a moderate heat is required, without the objections (as the over-heating of the air) almost inseparable from the use of iron heated surfaces. Their surfaces are glazed, and can be easily wiped over, and the variety of design and colour that can be got make them valuable as hall-stoves or for the heating of studios, shops, show-rooms and conservatories. They can be placed on a stone or tile hearth, and may be connected with the outer air. The sizes are various: some are 4ft. 3in. high, 1ft. 5in, wide, and 2ft. 1in. long; the smallest size is 3ft. 5in. by 1ft. 5in. by 1ft.

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IMPROVEMENTS IN THE TESTING OF CEMENT.

An important contribution on the tensile test of cement appears in the current number of the *Transactions* of the American Society of Civil Engineers. Mr. D. J. Whittemore, the author of the paper, has for some time been endeavouring to arrive at a more satisfactory unit of measure than that generally used in determining the actual tensile strength of a cement briquette. It is well known there are several forms and sizes of briquettes; the French engineers adopt an area of rupture of 4 by 4 centimetres, while in England and America the usual size is 1½in. by 1½in, but the form of briquette is often changed. The author, in a preliminary remark, justly says:—"It is known to many experimenters that, in tensile tests particularly, the apparent strength per square unit of ruptured area is greater in small than in large briquettes, and in an endeavour to determine the ratio of this apparent variation, I have made certain tests, in which investigation I employed cylindrical briquettes of two sizes, the larger one having a breaking section of 2 square inches, and a form and clutch appliance similar to that shown in my notes on Alfred Noble's paper last year." The smaller briquette and clutch is engraved; its breaking area is one-half of 1 square inch, and its form and clutch is said to possess marked features of excellence. If we may describe Mr. Whittemore's briquette without a diagram, we may call it a cylinder with three longitudial ribs or enlargements, each rib in section comprising an arc of about 58 degrees. In the centre of the briquette a channel is turned by which the area of rupture is reduced to a circular section, and the ribs or projections are rounded off to a spherical shape, the centre of which is upon the axis of briquette. This briquette is held by a gimbal-clutch, purposely designed by the author. The head of the briquette is introduced into an inner "gemel-ring," whose inner surface is turned to fit the surface of the briquette enlargement. It would be impossible to convey by description a notion of the appliance; we may observe, however, the effect of the clutch is to prevent any strain other than tensile, and to give the briquette perfect freedom of movement in reference to the pulling. The author also illustrates an ingenious press to secure uniformity in the moulding of specimens, by which apparatus the mortar or cement is acted upon by plungers at the ends of the mass, so as to secure homogeneity. The author's experiments prove beyond doubt an uniformity of results not found by the usual means of testing. The samples were all made of neat cement mixed thoroughly, all were brought to the same degree of plasticity, moulded under the same pressure, and when set were removed, placed in water for seven days, and then tested. The table given shows a very small variation from the mean, less than one-half that ordinarily obtained by the use of the circular briquette of 2 square inches breaking area and cup clutch. The principal brands of American hydraulic cements and English Portland were used.

Without going into the tables of analysis of the cements given, we may allude to an important table, recording the average of several tests, from which it is evident that the strength per square inch of the smaller briquette is double that of the larger. The author inquires: "What measure of the breaking section of the two sizes of briquettes is then most nearly proportional to their strength"? It appears that the diameter or circumference of the breaking section, and not its area, is more directly proportional to the resistance. With this idea, Mr. Whittemore instituted other tests, for the purpose of determining whether the peripheric strength really existed. For this purpose, hollow circular briquettes were made, having a peripheric measurement inside and out 50 per cent. greater, and an area 25 per cent. less than the solid one of the same exterior dimensions. The specimens were similarly moulded, and kept in water seven days; but the tests showed that there is no great difference in the absolute strength of the different parts of the mass. The explanation furnished by the author is reasonable; that in all tensile tests the stress at the clutch is at the surface of the specimens. Rupture first takes place at the surface, which reduces the section to the area at which complete separation takes place. The author proceeds to express his deduction from these experiments, and he gives the following formula. Let P represent the periphery of breaking section of known strength S per square unit. The strength S^1 per square unit of briquette of similar form and material, having a periphery P^1, will be :—

$$S = \frac{P\,S}{P_1}$$

The experiments from which this is deduced applied to briquettes with a rupturing area of from ½ to 4 square inches, kept in water seven days. The tables furnished by the author, showing the strength per lineal inch of periphery of the breaking section, and that per square inch, indicates that while the latter varied, the strength per lineal inch closely approximated in all the tests, and appears to bear out the conclusion above given.

A discussion of some interest followed, in which the author of the paper replied to several questions raised. Alluding to the length of time during which the specimens were exposed, the author said seven days were the limit. Grant's experiments in his work "On the Strength of Cements" were said to be corroborative, extending, in one series, to seven, and, in another, to thirty days; the latter showing almost similar results. Mr. Ashbel Welch, and Mr. W. P. Skinn, both thought that these experiments should be extended over long periods of time; another speaker, Mr. J. B. Francis, spoke of the value of mixing the cement with water of a high temperature, to cause quick setting; Mr. James B. Eads alluded to the elasticity of cement as being probably the secret of the phenomenon of the greater strength of small briquettes. Mr. Norton said that seven days of Portland cement will show from three to five times the strength of American, and, at seven days, Portland has two-thirds of its maximum strength. Another point of interest brought forward was the advantage of mixing cements of different kinds. Mr. Chesbrough alluded to a case in which the best cement was mixed with another of inferior quality, the result being that the mixture was a better cement than the best sort used alone. Mr. Whittemore corroborated the advantage of mixing.

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RHIND LECTURES IN ARCHÆOLOGY.

(*Concluded from p.* 469.)

INSCRIBED EARLY CHRISTIAN SCOTTISH MONUMENTS.

The fifth lecture was delivered on Monday. The subject was "The Inscribed Monuments of the Early Christian Time in Scotland." Such monuments, said the lecturer, were few in number, but the fact of their bearing inscriptions invested them with special importance. The chief question which he had to answer with regard to them was, what were the types of the inscriptions existing on undated monuments, which might be of the 12-century date or earlier? In the endeavour to frame an answer to that question an unexpected difficulty presented itself. The materials failed just at the very point where their testimony would have been most useful in the attempt to establish a point of departure from which they might work their way backwards, by tracing the transition from the dated to the undated monuments. It was a very remarkable fact that, though Scotland was exceptionally rich in monuments that yielded no definite monumental story, she was almost completely destitute of monuments that were, in a precise sense, historic. The art and interest of such monuments had not sufficed to save them from a destruction which was all but absolutely complete. Among 2,000 inscriptions collected from graveyards in the north-eastern districts of Scotland, the late Mr. Jervise found only one which he could assign with probability to the 12th century. It was a recumbent slab in the churchyard of Insch, Aberdeenshire, with an inscription in Latin, to which was prefixed a small Maltese cross—*Orate pro anima Raduffi sacerdotis.* This was one of the oldest existing inscriptions in Scotland, possessing what he might call the European character of the incised slab laid flat on the grave, and bearing the formula, "Pray for the soul of," preceded by the sign of the cross, and followed by the name and profession of the deceased. At Iona there were four inscribed monuments which were undated. The language of the inscriptions was Gaelic, and the lettering the ordinary Irish characters of the period. One of these stones bore the inscription, "Pray for Maelpatrick," and, therefore, fell in with the ordinary 12th-century type. The other three slabs differed from this one, inasmuch as they bore an incised cross of Celtic form as a principal subject, and not as a siglum prefixed to the inscription. The inscriptions were in the Celtic language, and showed the same formula—Pray for the soul of some one. In these monuments they had the transition from the European form of the 12th century to the Celtic form which preceded it. Following up the line of inscriptions graven in the ordinary character of the Celtic MS., they found that in all Scotland there existed but one example out of Iona. That was on the St. Vigeans sculptured stone. If it had occurred in

Ireland, this inscription would have been referred, by its palæographical peculiarities, to a period not far distant from the close of the 9th century. But it possessed no features to enable them to determine its date with greater precision. The type, character, and legibility of the inscription having been minutely considered, the lecturer noticed the reading given of it by the late Sir James Simpson, who believed the stone to be a monument to a Pictish king of the 8th century—viz., "The stone of Drost, son of Voret, of the race of Fergus," and gave his reasons for not accepting it, as in his opinion there was nothing against its being the work of the 10th or 11th century, and purely commemorative of men, not buried there, but venerated there. Drostan and Fergus were both names of saints venerated in Angus. The lecturer next went on to consider another variety of Celtic inscription which was not written in any of the literary alphabets of historic times, but was associated with the same kind of monument as this at St. Vigeans, bearing the cross on the obverse, and figure subjects and symbols on the reverse. Stones of this type, known as the Ogham inscribed monuments, were found at Scoonie, Aboyne, Logie (Aberdeenshire) and Golspie—these four being all that were known to exist on the mainland; but there were other seven examples in Orkney and Shetland. The basis of the epigraph on these stones was a stem line, on which other short lines or digits were arranged in four relative positions—to right, to left, across at right angles, or across at an oblique angle. From an examination of these digits, which occurred singly and in collocated groups of twos, threes, fours, and fives, an alphabet of 25 letters had been found to be represented. It was therefore possible that in this series of epigraphs they might be dealing with collocations of signs, which were capable of transliteration into vocables representing the ancient speech of the men who carved them. Whatever that speech was, it extended over the area ranging along the east coast from Fife to Shetland. This type of inscription was associated with the earliest style of art which was pure Celtic, not with the more recent, which was characterised by the prevalence of foliageous scrolls. In Shetland it was associated with the cross within the circle, which was the earliest of all the forms of the sacred symbol, and occasionally on monuments which had no cross and no art. They found that the distribution of this peculiar class of inscriptions was widely extended over the Celtic area. Upwards of one hundred monuments bearing this peculiar type of inscription occurred in Ireland, twenty-five in Wales, and two in Devonshire. Outside of the Celtic area there was not one. The inference was decisive—they were Celtic, and Celtic exclusively. Each group had, however, certain characteristic features illustrating the principle to which he had so often adverted, that special areas had special types, and showed that the element of area must always control the application of the deductions of archæology. Proceeding to demonstrate that these "Ogham" inscriptions were not exclusively monumental, he remarked that this peculiar form of writing also occurred occasionally in M.S. and on metal-work. In the M.S. copy of Priscian, which bore internal evidence of having been written towards the end of the ninth century, eight of the glosses were written in this peculiar style. In the Book of Ballymote, a compilation from various ancient MSS., written at Ballymote, in Sligo, in 1391, there was a treatise on the alphabets of the ancient Irish, in which the invention of this peculiar form of writing was ascribed to Ogma, son of Elatham, "who, being a man much skilled in dialects and poetry," invented the system of Ogham writing, "for signs of secret speech known only to the learned." That legend, however, was of no importance in their inquiry. Keys to this alphabet were given in the Book of Ballymote and in the Book of Leinster written in the twelfth century, but the explanations were as obscure as the text itself. No progress having been made in deciphering the monumental inscriptions by means of the MS. key, Bishop Graves constructed a key from the monuments themselves, the correctness of which was demonstrated beyond all doubt by another class of monuments of which they had only one example in Scotland. The solitary specimen of its type was a rude unshapen pillar of a dark blue stone, granitic in its nature, which stood now at Newton of Insch, Aberdeenshire. On its flattest side it bore an inscription in exceedingly debased Roman Minuscular forms, and on the edge of the stone there was an Ogham inscription. But the area of this type of bi-lingual inscriptions was not confined to Scotland. They occurred in Ireland and in Wales. Taking one of these monuments, on which both the inscriptions were quite distinct, such as that at St. Dogmaels, they found the inscription on the face of the stone reading plainly, *Sagrani fili cunotami.* Applying the ordinary Ogham key of the MSS to the Ogham inscription, it read as clearly, *Sagramni maqi cunatami.* It was clear that if the one inscription meant to those who could read the Roman characters that this stone was the monument of Sagranus, the son of Cunotamus the Ogham inscription had the same meaning to those who could read it. In the whole Celtic area there were fifteen such bi-lingual stones—one in Scotland, one in Ireland, eleven in Wales and two in Cornwall or South Devon. The type was therefore British rather than Scottish. They formed an intermediate link between the types which were characterised by Celtic inscriptions and Celtic art, and those which were characterised by Roman inscriptions and bore no traces of Celtic art. It was easy to disparage the study of these scanty remains of a literary language, which, though it was not dead, was more of an unknown tongue to their modern men of letters than almost any other. But no one now decried the importance of the scientific study of cuneiform inscriptions or hieroglyphic monuments, and the memorials which he had described stood in precisely the same relation to the language, literature, and history of Scotland, that these bore to the language, literature, and history of Assyria and Egypt. It seemed not, therefore, unreasonable to indulge the hope that the *perfervidum ingenium Scotorum*, stimulated by the establishment of a Celtic Chair in the chief University of the country, might yet accomplish for the legends of these Ogham monuments what Zeuss did for the language of the MSS.

ROMAN AND RUNIC INSCRIPTIONS.

The sixth and concluding lecture was delivered on Thursday, Oct. 21. In this lecture, said Mr. Anderson, three classes of inscribed monuments had still to be dealt with. The first of these was still bi-lingual, but in a different sense from those previously described. As type of these the lecturer chose for description the Ruthwell Cross, which was found in fragments, and pieced together by the late Dr. Henry Duncan, the minister of the parish. The whole height of the cross was about 17½ft., the shaft being 2ft. in breadth at the base and 15in. in thickness. The material was sandstone. It stood in the old church at Ruthwell until 1642, when the General Assembly of that year issued an order for its destruction as a monument of idolatry. It seemed to have been only thrown down, and to have lain on the floor of the church, close to the former site of the altar. In 1802 it was removed to the garden of the old manse, where it still remains. The monument was sculptured on its broad faces with figure subjects taken from Scripture and the legends of the saints, and on its sides with scroll work representing a vine, with birds and beasts lodging in the convolutions of its branches and eating of its fruit. The figure subjects were in panels, with flat borders, on which were incised the inscriptions which gave to the monument its special interest. They were in two languages and two alphabets, one set being carved in Roman capitals and the other in Runes. The inscriptions in the Roman letters were for the most part Scripture texts from the Vulgate explanatory of the figure subjects, the sculpture of which, says Dr. Duncan, would not have disgraced a classic age. The inscriptions were also exceedingly valuable in connection with the explanation of groups of sculptures on other monuments which bore no explanatory inscriptions. On the raised borders of the narrow sides of the monument were the inscriptions in Runes—that was, the alphabetical characters used by the Teutonic nations of the Continent before they conformed to the general usage of European literature. These inscriptions belonged to the Old Northern, or, as they were often termed in this country, Anglo-Saxon Runes. The story the lecturer told of the decipherment of these Runes was exceedingly interesting—some attempts at their transliteration, as he showed, having been productive of singular results. It was not till 1840, when the attention of Mr. J. M. Kemble, an accomplished Anglo-Saxon scholar, had been turned to the inscription that its true import was ascertained. The inscription on one side of the cross commenced with the words, "Christ on the Rood," and the whole inscription turned out to be a poetical description of the Passion of our Lord. A remarkable confirmation which Mr. Kemble's reading subsequently received invested it with an interest that was almost unparalleled in the history of literary discoveries. Two years after he had deciphered the inscription, in turning over the leaves of a book bearing the unpromising title of "Appendix B to Mr. Cooper's Report on Fœdera," Mr. Kemble's eye was arrested by certain lines in an Anglo-Saxon poem, which, on comparison, he found to be identical with those on the cross. The lines were from a poem entitled the "Dream of the Holy Rood," which had been written in the South Anglican dialect before the tenth century. The passage carved on the cross was in a North Anglican dialect. If they judged the wide area over which it had been traced, it must have been a poem which was popular and highly esteemed. The MS. gave no clue to its authorship, but, according to Professor Stephens, the cross did. On the upper part, over the inscription, he read the words, "Caedmon made me," and reads them not as of the cross, but of the poem. Caedmon, who died in 680 A.D., was well known as the father of English poetical literature. Such was the story of the Ruthwell Cross. He knew nothing in the whole range of monumental history that surpassed it in interest. It was not only a finger-post, but a land-mark, in the history of English literature. It was a monument, unique of its kind, bearing witness to the existence of an artistic culture, which, for its age, was high, and of a literary culture which few of other succeeding ages have greatly surpassed. It was a monument of which the nation of whose history it formed a conspicuous part might well be proud. Yet look at its pitiable history. Demolished, broken, buried; restored and reconstructed by private enterprise, deciphered and demonstrated to be of national importance as a literary and historic monument, and yet left to weather and decay. Had it been covered with Asian bi-linguals or African hieroglyphs, it might at least have had the chance of being acquired at great expense and brought to this country in triumph, with much public rejoicing over its acquisition. For it could still be said of them that while they acquired and preserved the monuments of other nations, and grudged no outlay which helped to illustrate the history of literature and art in many lands, they consigned the few that time had spared to them in their own land to oblivion and decay. (Applause.) Having thus followed the line of Celtic inscriptions up to a point at which they became bi-lingual, the lecturer next invited attention to inscribed monuments in the partially-debased style of the Roman alphabet. One of the most remarkable of these was the Catstone on the banks of the Almond, near Edinburgh, which bore this inscription—IN OC TVMVLO IACIT VETTA F[ILIVS] VICTI (in this tumulus lies Vetta, son of Victus). It presented three special features which they should find to be characteristic of Christian inscriptions alone—(1) the use of the formula *in hoc tumulo*; (2) the use of the formula *jacit*; and (3) the use of the formula giving the name and patronymic of the deceased. All these were features which were not found on Roman monuments of heathen origin. Among 1,300 inscriptions of the Roman time in Britain previous to the prevalence of Christianity, collected by Hubner, there was not one that presented any of these formulæ. The place where this monument stood had been examined by Mr. Hutchinson, of Carlowrie, in 1865, and was found to be an ancient Christian cemetery. No fewer than 51 graves were found arranged in rows—the heads to the west, and the feet to the east—this orientation in burial being explained by Durandus to be due to a desire that the dead, when they rise in the resurrection, may face their Lord as He comes from the east. No other monument of that early time could be found in Scotland still standing like the Catstone in the midst of its graves. Another of the same class existed at Yarrow Kirk, in Selkirkshire. The stone of the Apostle Peter at Whithorn was next described. The cross upon it, formed by the intersection of four arcs of circles, was one of the oldest types of the sacred symbol in Scotland. That it was so in this case was proved by the fact that it had attached to the left upper corner of the summit the sign which distinguished the Chrisma, or the conventional form of monogram known as the cross of Constantine. They could, therefore, say with certainty that this monument could not be earlier than the end of the fourth, and that it might be as late as the latter part of the sixth century. The inscription upon it was, LOCI STI PETRI APVSTOLI, and, consequently, not a sepulchral monument at all. The raising of memorial crosses in honour of saints was a common custom in the early Church. At Kirkmadine, Wigtownshire, there were also two remarkable monuments, performing, or till quite lately performing, the humble duty of gate-posts to a disused burying-ground. Both bore the incised monogram of the Chrisma. On one, in legible Latin, was the inscription, "Here lies the holy and excellent priests, to wit, Viventius and Mavorius." On the other, the only words legible were ET FLORENTIVS. With that type of monument, inscribed in Roman characters which were but slightly debased, and presenting no indications of Celtic art, the line of Christian inscriptions in Scotland ended. They had traced it back to a point at which another step would bring it within the period of the Roman domination, and among forms no longer Christian, but pagan. The last group of inscriptions to be dealt with were exceptional in character, and restricted to the area which was conquered and colonised by the Norsemen in the eight and ninth centuries, comprehending the isles of Shetland, Orkney, Hebrides, and Man. The art in these monuments, it was shown by the lecturer, was purely Celtic, but the inscriptions were in Scandinavian Runes. Here was evidence that the Celtic art held its ground while the language failed—a striking testimony to the intensity of the character of the art and the power of its absolute individuality. In conclusion, Mr. Anderson remarked that he had now set before them, as briefly as was compatible with clearness of description and classification, the various types of existing relics which gave testimony to the nature and quality of the art and culture developed and brought to maturity in connection with the civilisation of the early Christion time in Scotland. If he had succeeded in demonstrating the existence of a series of art relics and directing attention to the remains of an early culture hitherto but little known and less regarded, he trusted that they would lose no portion of their interest if he had also shown that they were, for the most part, products that had been peculiar to an area which, though it might be geographically defined as North Britain, history and archæology alike must always recognise as Celtic Scotland.

◆

OUR RAILWAY BRIDGES.

A TIMELY warning is better than a sermon after the event; and one may, therefore, do some good by calling attention to the necessity for watchfulness on the part of those who have charge of many of the smaller structures which carry our lines of railway, not only in large towns, but in country and remote districts. Remetalling the railways is constantly going on, but it is a work the immediate consequences of which are felt by the companies in more ways than one. New and larger stations are constantly being carried out, for the same reasons; but there is one class of structures we are inclined to think, which, because they are out of sight, are liable to be neglected or forgotten altogether; and, the larger the company's traffic may be, the greater the miles travelled over, is the risk proportionately increased. We do not speak so much of the larger structures which span our rivers and roads, but of the smaller bridges. It often occurs to us, for instance, when we are travelling over or under them, whether they have been retested since their first construction; how often they have received official inspection; how long since they were painted. A writer in a contemporary, the other day, suggested that many of the small railway bridges must be in a dangerous condition; we simply ask, how often have they been attended to, and whether they receive periodical inspections? Many of the girder bridges in London are in an extremely rusty condition underneath; but we seldom find they get a coat of paint; if these remain so long, what must be the state of many of the smaller out-of-the-way girder bridges which cross turnpike roads and lanes in country districts.

Many of these structures have been erected for half a century, and the question at once arises, if they are still in so good a state for traffic as they were formerly. It would be a physical impossibility that they should be. In the first place, time has weakened them; if of timber, decay has commenced its work, and, if of iron, the oxidation going on must have considerably reduced their marginal strength; in the next place, they were erected when the weight of our engines was considerably less than it is now;—in fact, not more than half their present weight. Both these causes have operated seriously in impairing the strength of the bridges, and they appear to us to suggest serious misgivings about the safety of the neglected and earlier structures of iron. It is fortunate that in many cases the girders of the smaller bridges were made deeper and stronger than the necessity of the hour required; but it must also be remembered that this margin or factor of safety has been considerably reduced by oxidation and increased work. What is true of the girders and their connections, due to cracks and corrosion, is true also of the supporting brick piers. We have come across several bridges where the piers have undergone settlement or fracture; now these fractures lead to other consequences than the subsidence of the masonry. They may lead to the weight of passing loads falling on a few or even a single girder, thus straining it to a greater extent than is safe. Some of the large templates on which the girders rest may be seen cracked. These defects do not occur probably in the admirably maintained lines of railway northwards from London, but will be found in some of the lesser lines and branches. Many of the iron girders over which thousands travel every day to and from the metropolis and other large towns, may be found in a very critical condition, and close inspection would, we doubt not, reveal defects, cracked rivet-holes, &c., of an alarming character. Many of them are a mass of corrosion, and look as if they had not received attention for years, and the stations with their galvanised corrugated roofs are worn into holes.

◆

HOUSE-DRAINS AND THEIR RECORD.

THERE is little unanimity of opinion respecting the sizes and inclination of house-drains, and it would be a public benefit if certain rules were obeyed in this respect. Some engineers adopt the smallest possible pipes: they consider a 4in. stoneware pipe equal to perform the duty of several houses; while others as strongly contend that a 6in. pipe is not too large to carry off the drainage of the smallest tenement. One eminent engineer says a 9in. pipe is much too large for considerable houses. Then, again, as to inclination, the question of size depends on fall, and the inclination in its turn often on the depth of sewer. An inch in 10ft. is sufficient when the drain can be well flushed, but it is seldom there are means for this purpose, yet Field's self-acting siphon might be used with advantage. A fall of 1 in 30 is recommended by some engineers, and may be taken as a good inclination for common house drains. A 6in. drain laid to as flat a fall as 1 in 200 has been found to answer well when flushed. Now the rainy season has set in, the advantages of both size and inclination may be estimated, for it is quite certain a large number of our houses are drained by pipes of quite inadequate capacity for their falls. With a good fall a 4in. drain is sufficient for half-a-dozen small houses, but it would be folly to use it with a flat inclination. When several small pipes join, of course a large junction proportionate to their collective capacities is necessary; it would be easy to prove that this is neglected in many districts which, of course, suffer from periodical overflows.

From the evidence furnished before the Sanitary Section of the last conference on Public Health, it appears that out of numerous cases, very few drain plans of properties exist. Is it not time that a regulation should make it compulsory for every house-owner to produce a plan showing the position and levels of his drains? Very few of the houses tenanted in new localities have plans prepared; with regard to old houses, the difficulty of obtaining access to the drains is, of course, greater. A thorough inspection and survey of all house-drains to old houses would be a valuable source of sanitary evidence, and the local authorities ought to be invested with powers for this purpose. If our sewers are worth mapping with accuracy, our house-drains surely are worth the trouble of unravelling.

◆

CHIPS.

The parish-church of St. Peter, Coton, was reopened by the Bishop of Ely on Wednesday week, after the restoration of the chancel. Mr. H. Fowler, of Durham, was the architect, and Mr. Burton, of Newcastle-on-Tyne, the contractor.

The Governors of Carlisle Grammar School have purchased a site in Spring-gardens for £3,000, and have invited seven architects, three or four o whom reside in that city, to compete for the proposed new school-buildings.

The Wesleyan chapel at Lanivet, near Bodmin, was reopened last week, after entire internal reconstruction, from the designs of Mr. W. J. Jenkins, of Bodmin. A new floor has been laid, and lean-back, open seats, with carved ends, have taken the place of the old pews, and a rostrum has been substituted for a high pulpit. All the fittings are of pitch-pine. A granite portico has been thrown out.

A meeting of the County of Durham Surveyors' and Sanitary Inspectors' Association was held at Spenuymoor, last week, under the chairmanship of Mr. W. Robson, C.E., Bishop Auckland. Mr. George Bell read a paper on "A Self-acting Combined Water-closet and Ashpit," and the chairman followed with a paper, explanatory of the sewage-works for Bishop Auckland, at Middletown Moor, where land irrigation is adopted, before passing the effluent into the river Wear. At a later period of the day, these works were visited by the members, who dined together in the evening.

The foundation-stone of a new Board-school was laid at Shap, on Thursday week. It will provide accommodation for 57 girls and 32 infants at a total cost of £870. Messrs. Ruddick and Sons, of Shap, have taken the contract for masonry; Mr. W. Leighton, Shap, that for joinery; and Mr. T. Manson, Carlisle, that for slating.

The new Theological College at Cambridge, called Ridley Hall, will be opened by the Vice-Chancellor, for the reception of students, next week. As built, it consists of eight sets of rooms, a lecture-hall, measuring 41ft. by 22ft., and 20ft. in height, and a principal's lodge, containing nine bedrooms, dining-room, drawing-room, study, &c. Rel Suffolk bricks have been used, with Ancaster stone for dressings. The site of the hall is opposite Newnhsm Hall.

The chancel of Stow parish-church, Hnnts, has been reopened, after partial rebuilding. A new roof has been placed upon it, of oak, open-timbered, and covered with plain tiles; new choir-stalls and altar rail of oak are provided, the latter being supported by brass standards. The windows are filled with tinted cathedral glass, and the floor is laid with Minton's tiles. At the same time, the roof over east part of nave has been renewed. Mr. Ewan Christian, of London, was the architect; the works have been carried out by Mr. William Wade, and Messrs. Edey and Son, of St. Neots, Hunts.

A new county muniment-room has just been added to the Shire Hall, at Carlisle, from the designs of Mr. Cory, the county surveyor, and the records and documents are about to be removed to it, and arranged and scheduled.

The district highway board of Woburn, Beds., accepted, on Thursday week, the resignation of Mr. Adkins, their surveyor, and resolved to offer a salary of £220 to his successor.

It has been decided to replace the present church at Stoke Damerel, near Plymouth, by a new edifice, to be built from the designs of Mr. J. Piers St. Aubyn, of London, and estimated to cost £18,000.

New premises have just been completed at Sowerby Bridge, for the United District Flour Society, at a cost of £4,000, from the designs of Messrs. Utley and Grey, architects. The whole of the works have been executed £16 within the architects' estimate.

A new font has just been placed in the Lady or Trinity Chapel of Ely Cathedral, replacing a poor one of Late Perpendicular character, which is to be removed to a hamlet church in the same parish of Holy Trinity. The new font is an octagonal basin and pedestal of Paiuswick stone. Eight colums of Purbeck marble support the basin, which is ornamented on the faces with foliage diaper-work. The whole stands on a step of Yorkshire stone. Mr. J. Piers St. Aubyn, of the Temple, London, was the architect, and Mr. Earp, of Lambeth, the sculptor.

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ARTISTS' HOMES: NO. 8, MR. VAL. PRINSEP'S HOUSE AT HOLLAND-PARK. — NEW TAVERN, VICTORIA DOCKS. — NATIONAL PENNY BANK AND ARTISANS' DWELLINGS, CLERKENWELL.—ST. JAMES'S CHURCH, CROYDON.—NAVE STALLS IN ROCHESTER CATHEDRAL. — OLD EMBROIDERY.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES.—NO. 8: MR. VAL. C. PRINSEP'S HOUSE, KENSINGTON.

For description see p. 511.

NEW TAVERN, VICTORIA DOCKS.

This tavern is one of several about to be erected for the London and St. Katharine Docks Company, at the new Royal Albert Docks, by their architects, Messrs. Vigers and Wagstaffe, of 4, Frederick's-place, Old Jewry, E.C. The materials will be picked Bracknell red brick facing for the ground-floor, and framing of English oak for the upper portion, the spaces between the timbers being filled in with "rough-cast." On the ground-floor will be a spacious bar and public room, with ample kitchen accommodation; and on the first floor a club-room and reading-room, besides private sittingrooms and bedrooms. The contractor for the works is Mr. George Shaw, of Page-street, Westminster. Our illustration is taken from the drawing hung in this year's Exhibition of the Royal Academy.

NATIONAL PENNY BANK AND ARTISANS' DWELLINGS, CLERKENWELL.

This block of buildings has been erected by the National Penny Bank Company (Limited), as a branch office, and to provide comfortable rooms for artisans and others in this populous and busy district. On the ground-floor are the bank and three commodious shops. In the basement are the kitchens, &c., to the shops, and a large fireproof workshop. On the first floor are the bank collector's rooms, and living and sleeping rooms in connection with the shops. The four floors above consist each of 2 sets of 3 rooms, and 2 sets of 2 rooms. The roof is a flat, formed of iron joists and concrete covered with asphalte, and is available for clothes-drying and as a playground for children. There is a washhouse on the roof, though not as shown on the drawing, this having been altered in execuion to reduce the cost. A wide and easy staircase of York stone (well open to the air and well lighted, yet secured from the rain) gives access to the various floors and the roof. The materials used are for the facings, picked stocks with a few bands and arches of red brick. Brown's moulded bricks for string-courses, etc., and buff-coloured terra-cotta dressings. The badge of the bank in red terra-cotta has been used under the crowning cornice, and as a string at the second-floor level. The work has been carried out at a cost of about £7,000, by Messrs. Aitchison and Walker, builders, of St. John's Wood, from the designs and under the superintendence of Messrs. Henman and Harrison, architects, of 64, Cannon-street, E.C. The clerk of the works was Mr. F. Dashwood.

NEW CHANCEL, &C., ST. JAMES'S CHURCH, CROYDON.

The Church of St. James's, Croydon Common, was erected about forty years since. It is a brick building (in a style which then very generally passed current as Gothic) which for baldness and meanness of appearance and incongruities in the details could hardly be surpassed. There are galleries to three sides of the nave; the organ-chamber was in the tower, and the dimensions of the chancel were 17ft. wide, by 10ft. deep. The considerable advance which has of late years taken place amongst the general public in knowledge of architectural style and in artistic taste caused many of the congregation to become dissatisfied with the building, and a movement was set on foot for the improvement of the church. The original intention was merely to modify the present building, and drawings were got out accordingly; but it was considered that their execution would certainly be costly, and probably unsatisfactory; so it was determined to have plans prepared for an entirely new church, to be built by instalments, as funds would permit. The illustration we give in this week's issue shows the first portion erected, consisting of a chancel 36ft. long, 21ft. wide, and 36ft. high to the underside of the boarded ceiling, internal dimensions; at south aisle to chancel, an organ-chamber, vestry and heating chamber. The cost of this portion, which is being carried out by Messrs. D. Laing & Co., of 41, Parliament-street, is about £2,200, exclusive of fittings and warming apparatus. Messrs. Benham and Son have the latter in hand for the whole church. The materials for the new building are coursed Kentish rag facings, with Bath stone dressings and tracery, and Staffordshire tiles on the roofs. The east window is to be filled with stained glass as a memorial to the Rev. H. C. Watson, M.A., the late Vicar. This has been designed by Mr. Walter H. Lonsdale. The clerk of the works is Mr. S. A. Clark. The architect is Mr. Charles Henman, A.R.I.B.A., of Croydon, and 64, Cannon-street, E.C.

ROCHESTER CATHEDRAL, NAVE STALLWORK.

The accompanying illustration shows the stallwork recently placed in the nave of Rochester Cathedral, as a memorial to the late Philip Cazenove, Esq., by his son, the Rev. Arthur Cazenove, vicar of St. Mark's, Reigate, Surrey. They were executed in pitch-pine, from the designs and under the superintendence of Mr. John P. Seddon, architect, of No. 1, Queen Anne's-gate, Westminster. They were executed by Messrs. Belham, of 155, Buckingham Palace-road. The bishop's stall, to the eastward of the rest, was commissioned at the same time by the Very Rev. the Dean and the Chapter of Rochester Cathedral.

OLD EMBROIDERY.

The sketches of embroidery were obtained from a private collection exhibited at the Manchester Art Treasures Exhibition. The colours of the Italian embroidered border in wool are: outer border line, light purple; middle line, yellow; inner line, dark salmon; stem, green edges and light yellow centre; left-hand leaf, white, shaded into light blue at centre, and dark purple edges; flower, white, shaded into dark dull red; right-hand leaf, dark salmon centres, shaded into light salmon edges. The Salonica silk square has outer border-line, and divisions of squares of dull green lines; border ornament, alternate brown and red, joining lines and stars, the former stars having plain centres, the latter dull, slightly reddish yellow centres; the left-hand square, red lines, stars reddish yellow centres, centre of diagonal square and corner ornaments light blue; the right-hand square, brown lines, stars plain centres, centre of diagonal square and corner ornaments yellow, as before. The description of colours used can only be approximate, the general effect depending considerably on the peculiar tints of colour used.—John B. Gass, Bolton.

◆

At the West Riding of Yorkshire Quarter Sessions, held at Wakefield last week, it was agreed to purchase 27 acres of land at Wadsley Hall, Ecclesfield, for the purposes of the South Yorkshire Pauper Lunatic Asylum.

ST. ALBAN'S ABBEY.

Mr. H. J. Toulmin, in a letter to the *Times*, thinks it is due to the committee and himself to say a few words in answer to Sir Edmund Beckett's letter:—

Sir Edmund is doubtless a great master of invective; but I think the public who are interested in St. Alban's Abbey would have preferred his keeping to the architectural points at issue, instead of making personal remarks and abusing me.

1. It is perfectly true that at one of the committee meetings an estimate for works undertaken was asked for rather suddenly, and some extra works were omitted by mistake. This was rectified at the next meeting, but it is quite a mistake that it led the committee into any debt. The debt was caused solely and entirely by the construction of the new roof for the nave.

2. Mr. Chapple, an able clerk of the works, for whom I have as great friendship and regard as ever, has told me more than once that the tracery of the west window can be repaired for about £400, and Mr. John Scott mentions even a less sum; this of course, does not include spandrels and buttresses and other extra work.

3. It is also true that I have often expressed my wish to Sir Edmund and others that we might restore the Early Lancet windows of the time of King John and Henry III., the best period of English Art. As Mr. Chapple has found portions of the dog-tooth mouldings and jambs of those early windows, there would have then been an excuse for taking out the large Perpendicular window inserted by Abbot Wheathamstead in the time of Henry VI. But Sir Edmund prefers his own independent line, and will have the west front filled in with Decorated details and a large Decorated window, although he knows perfectly well there never was a scrap of Decorated work in the whole of that portion of the Abbey.

This would therefore be an innovation, not a restoration.

Sir Edmund ends his letter very amusingly, and likens himself to a patient bull and me to an aggressive dog. I am afraid my letter was rather like a red rag to this patient bull. But still, if English bull-dogs on the watch are able to prevent headstrong bulls of Bashan tossing to the winds historical and interesting remains which never can be replaced, I think our British architects and the public generally will not say I have written in vain.

THE ARCHITECTURAL ASSOCIATION.

The programme of proceedings during the session of 1880-1 is as follows:—

Oct. 29, 1880, to-night (Friday), Opening Conversazione.
Nov. 5, Address from the President. Mr. Ernest C. Lee.
Nov. 19, The Use of Cements. Mr. Gilbert R. Redgrave.
Dec. 3, Furniture. Mr. C. G. Vinall.
Dec. 17, The Architectural Treatment of Small Staircases. Mr. Aston Webb.
Jan. 7, 1881, A Week in Norfolk. Mr. C. R. Pink (Hon. Sec. Excursion Sub. Com.)
Jan. 21, Parsonages. Mr. Lacy W. Ridge.
Feb. 4, The Sanitary Work of an Architect. Mr. Ernest Turner.
Feb. 18, In Lombardy with the Architectural Association. Mr. Edward J. Tarver.
March 4, Cheap Churches. Mr. William White, F.S.A.
March 18, Holland. Mr. R. Phené Spiers.
April 1, Swimming-Baths. Mr. L. C. Riddett.
April 29, Members' Soirée (Assemble at 8 p.m. Members only admitted).
May 13, Queen Anne Architecture. Mr. W. Burges.
May 27, The use of Marble and similar materials in English Architecture. Mr. T. G. Jackson, M.A.
June 10, Colour Decoration as applied to Architecture, from a Painter's point of view. Mr. R. Corbett.

◆

Extension works and improvements are being carried on at the North-wall, Dublin, from the plans and under the supervision of Mr. Stoney, engineer of the port. The quay now permits of vessels of 2,500 tons being unloaded direct into railway waggons. New warehouses have just been erected alongside by the North Dublin Warehouses Co., which have a capacity of 700,000 qrs. of grain. In place of hydraulic or steam power, the machinery for elevating and storing the grain is moved by Otto's silent gas engines, which are also utilised for power for turning the grain so as to reduce manual labour to a minimum. The buildings and machinery are from the designs of Mr. R. H. Leask, consulting engineer, Dublin, and the warehouses have been erected by Mr. Joseph Kelly, of Thomas-street, in the same city.

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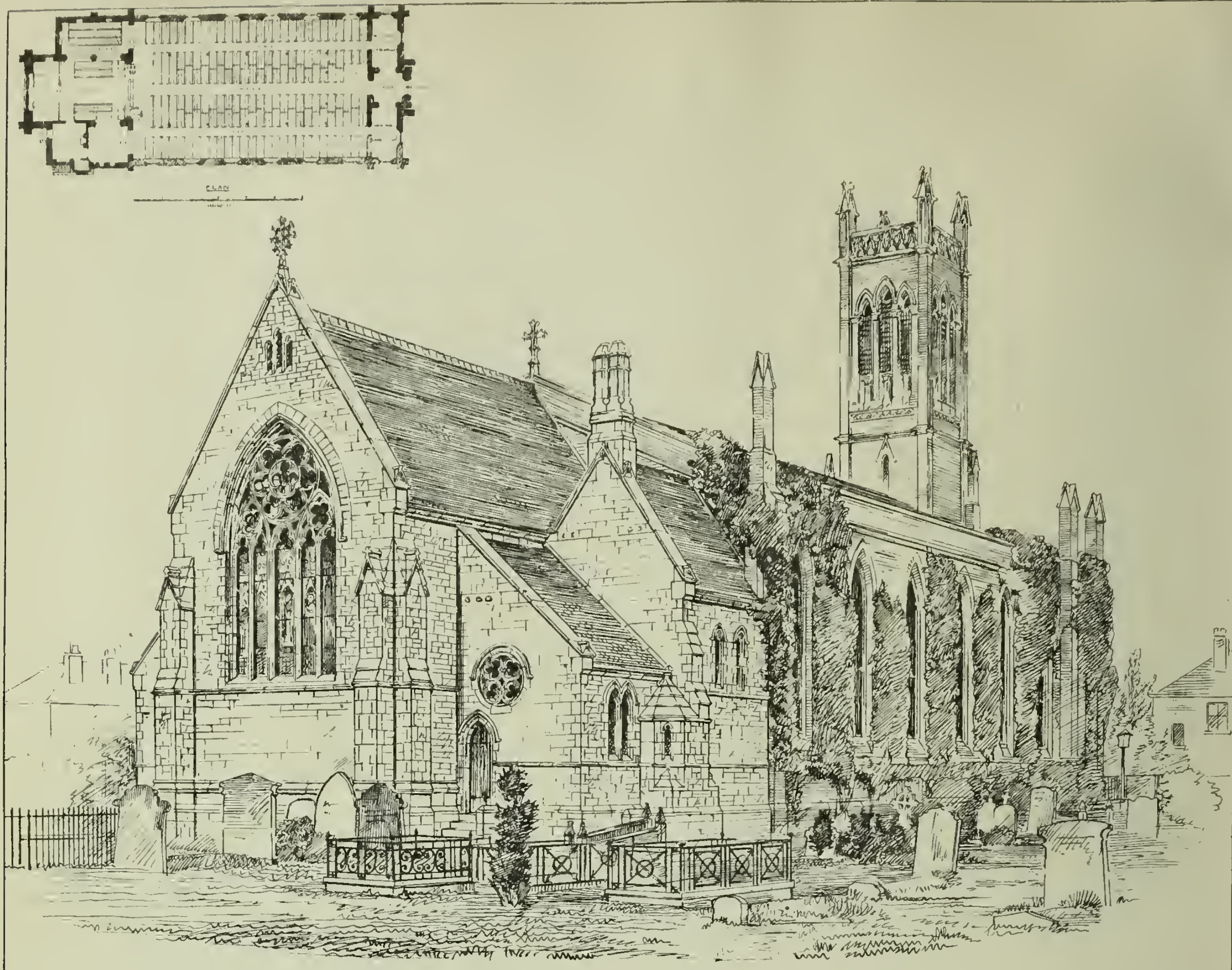
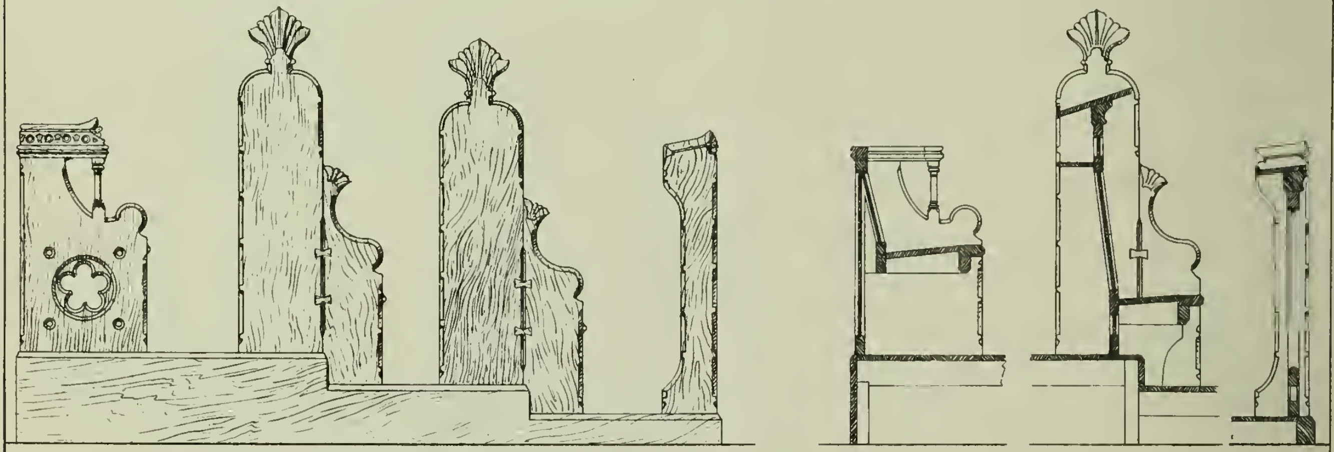


ST IAMES. CH CROYDON. NEW. CHANCEL. VESTRY & ORGAN. CHAMBER

CHARLES HENMAN, ARCHITECT



END ELEVATION TOWARDS NAVE

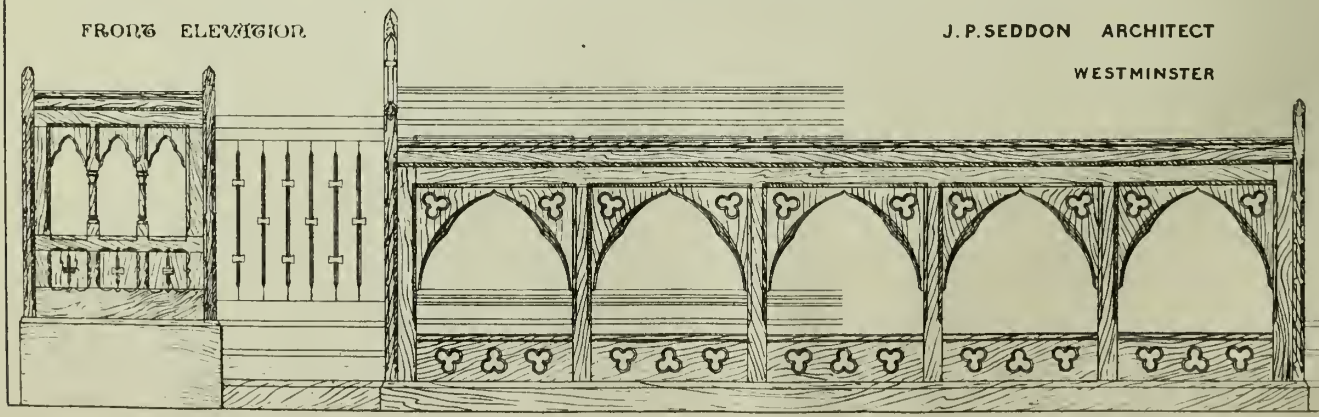
SECTION

NAVE·STALLS·ROCHESTER·CATHEDRAL

FRONT ELEVATION

J. P. SEDDON ARCHITECT

WESTMINSTER



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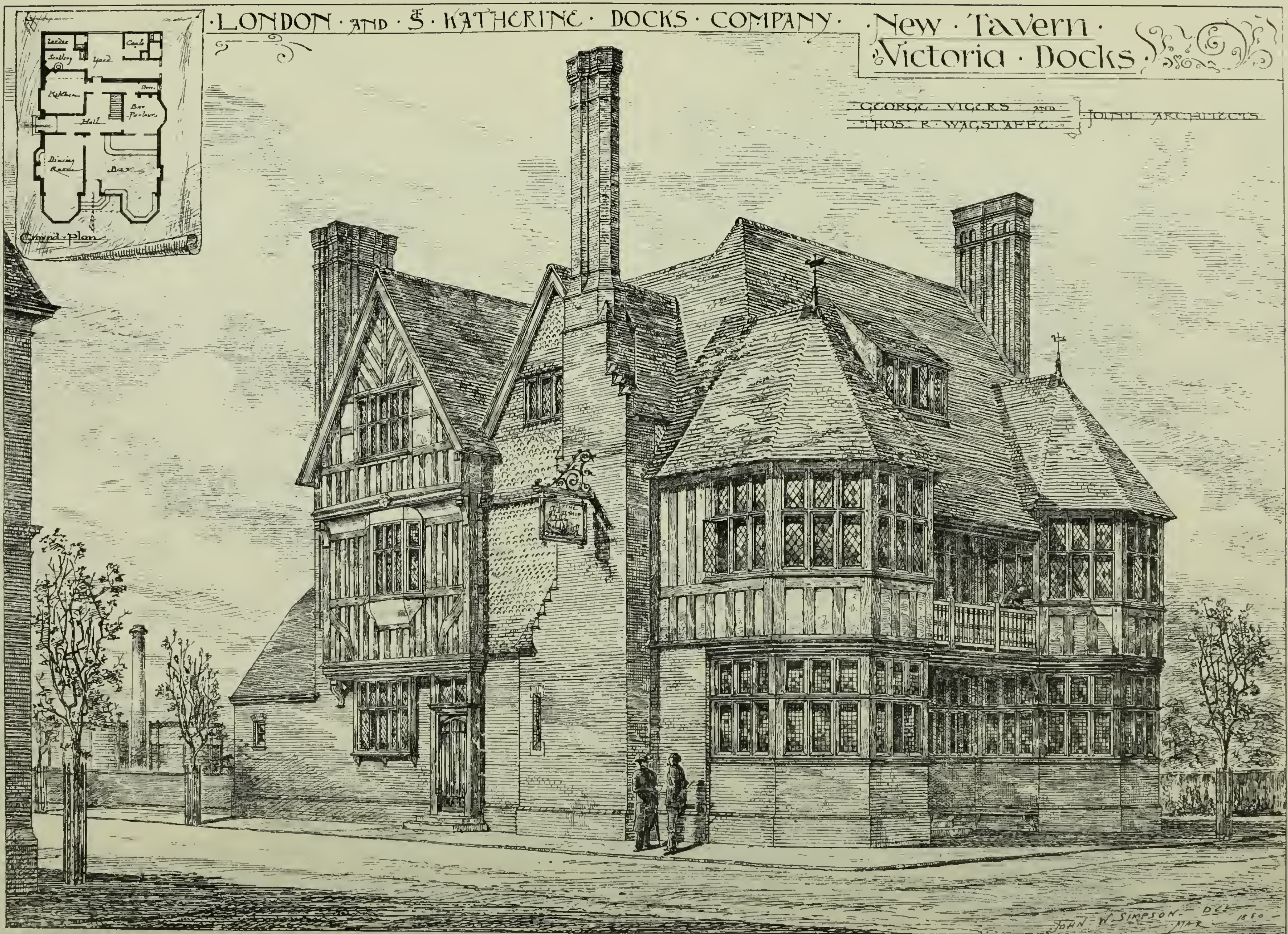

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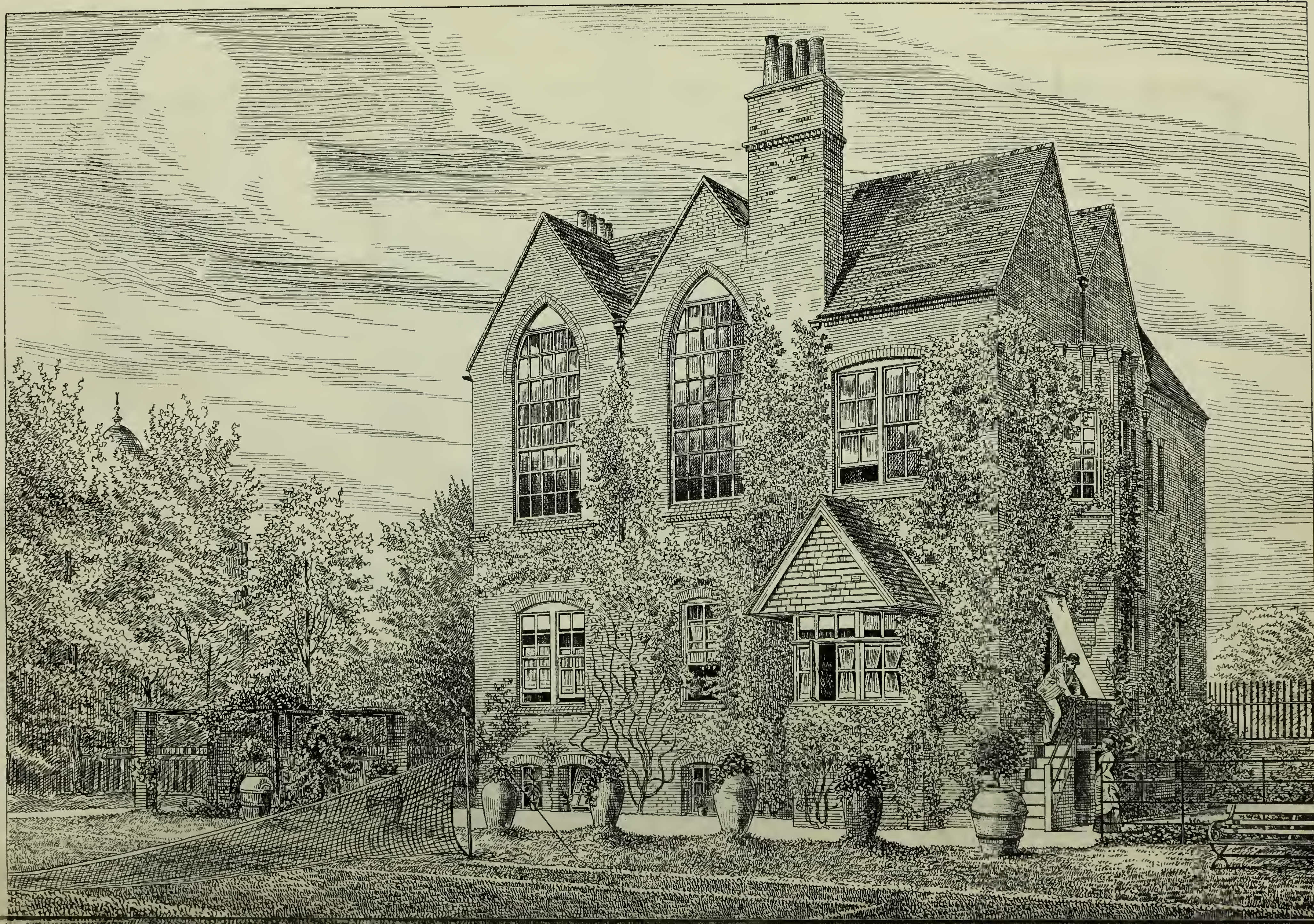
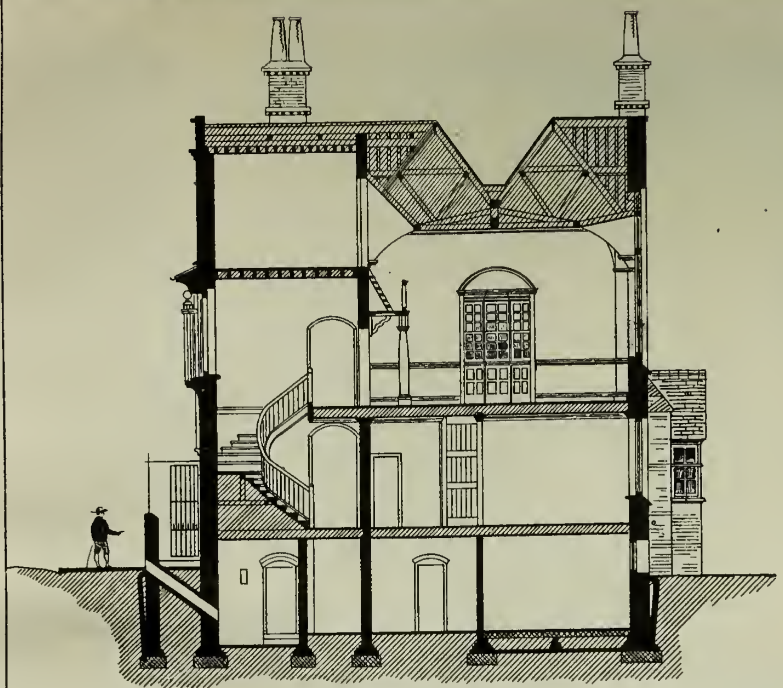
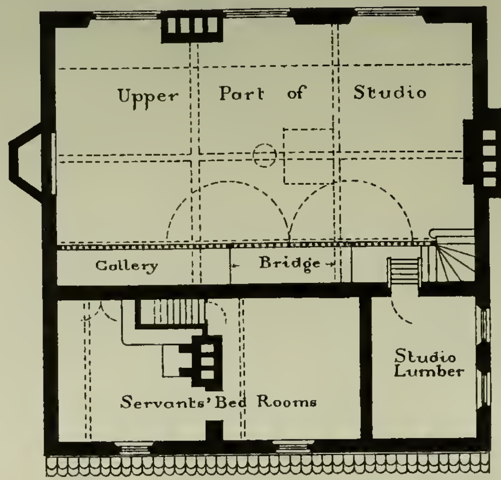


J Akerman, Photo-lith. London

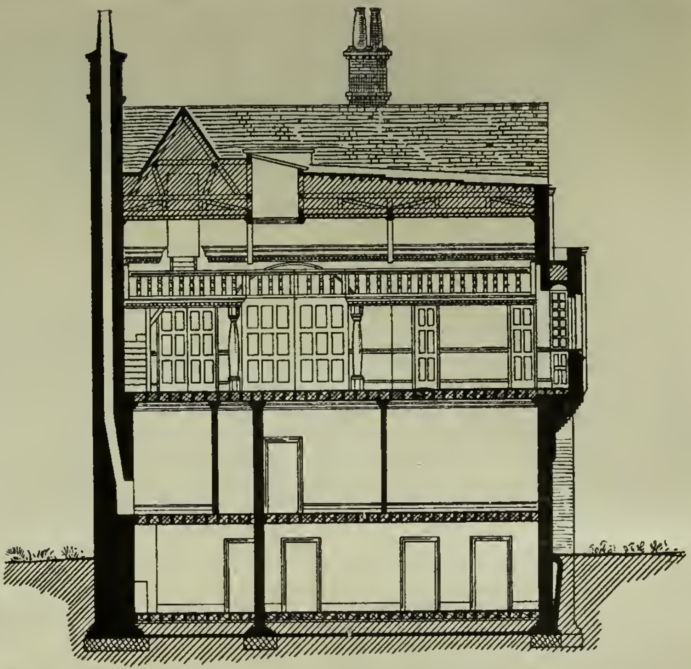


Section on line A·B·

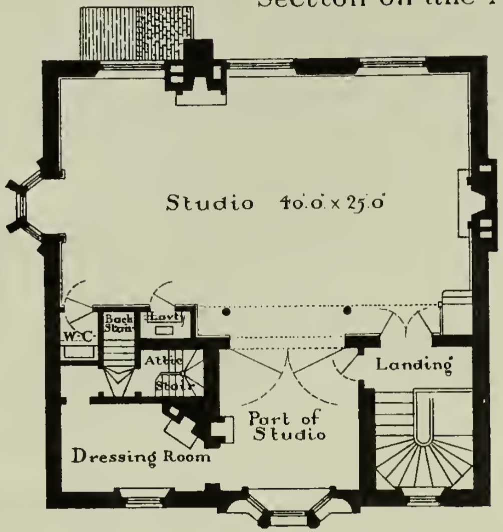


Second·floor
Scale of feet

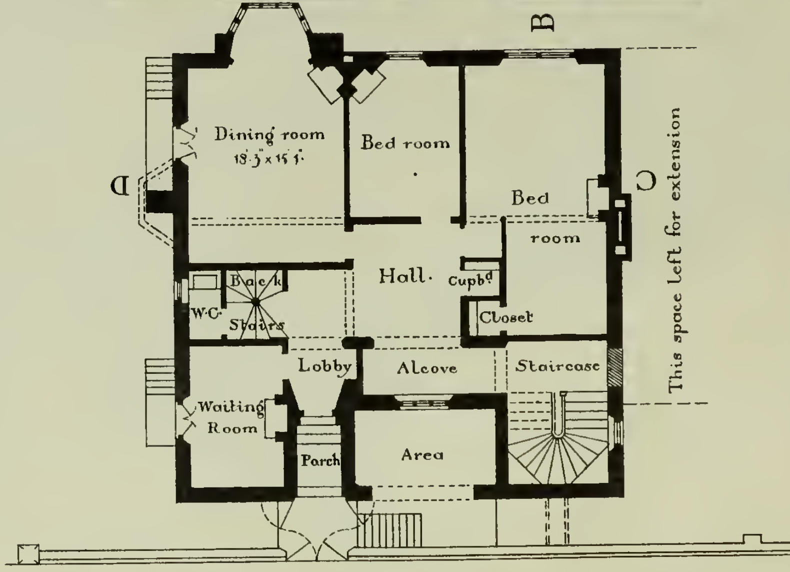
10 5 0 10 20 30 40 50



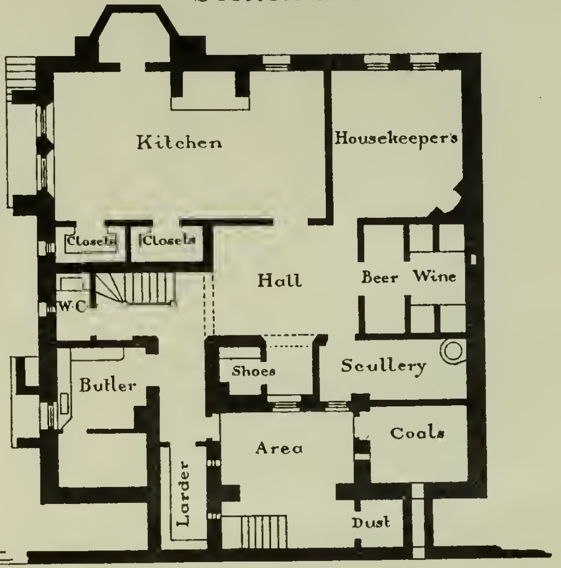
Section on line C·D·



First·floor·plan·



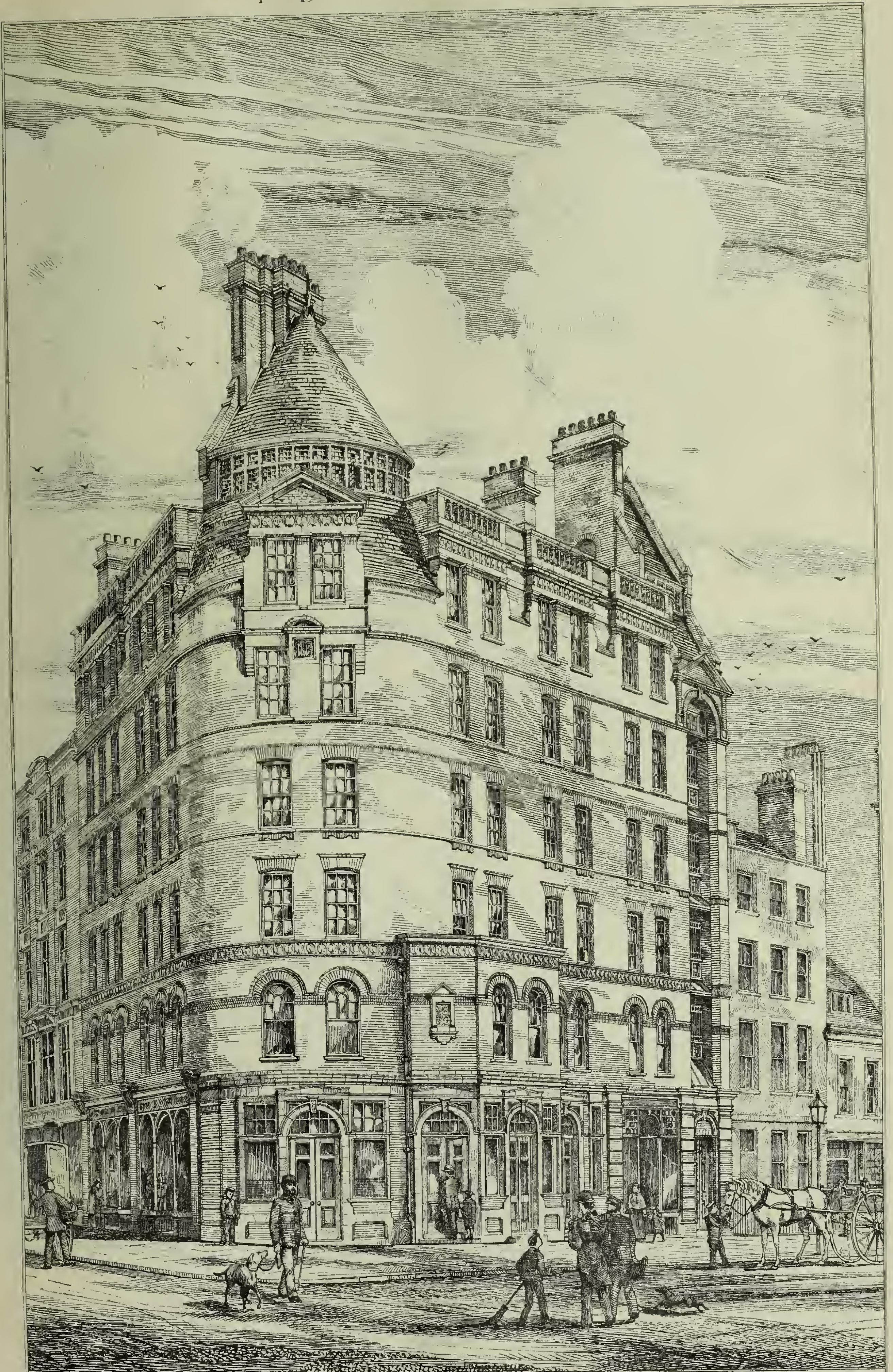
Ground Plan



Basement Plan

MAURICE B ADAMS DELT

Artist's Homes No 8 · Mr Val·C·Prinsep's Studio and House · Holland Park Kensington Philip Webb Archt



PROPOSED NATIONAL PENNY BANK AND 'ARTIZANS' DWELLINGS, CLERKENWELL:

HENMAN & HARRISON
ARCHITECTS

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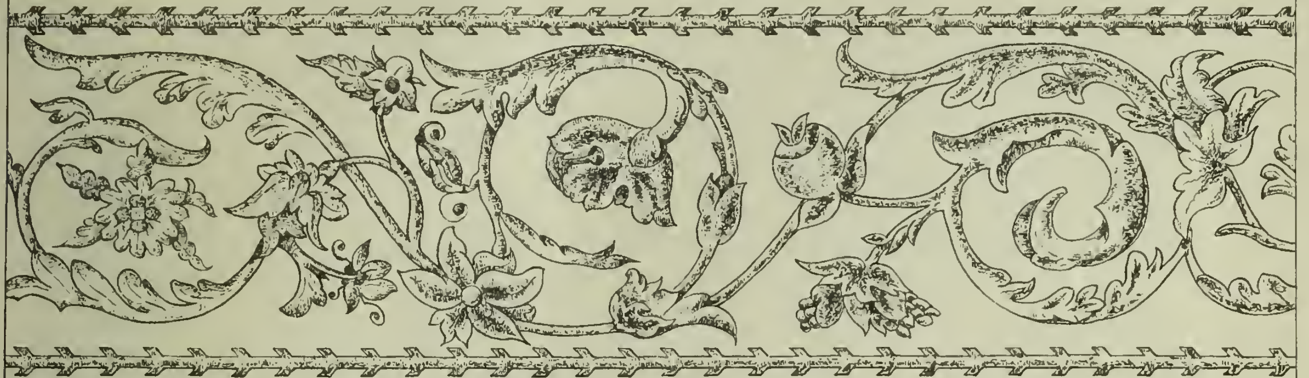
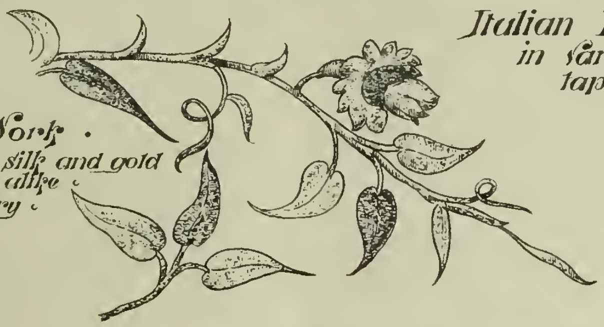
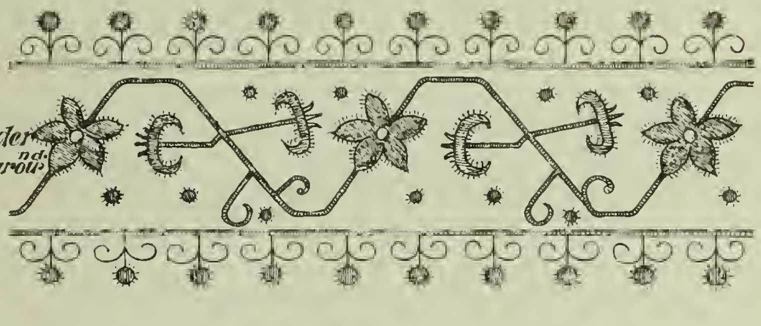


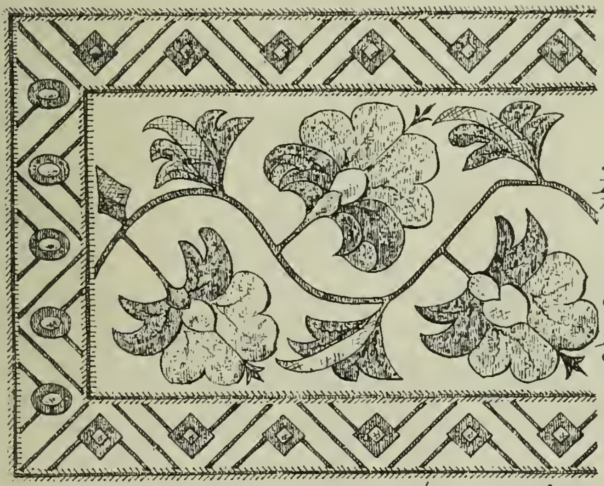
Italian Embroidered Border,
in various coloured silks,
tapestry work, tent stitch ·
16th. century · ·
9 ins. wide ·



Persian Work ·
embroidered in silk and gold
both sides alike ·
18th. century ·

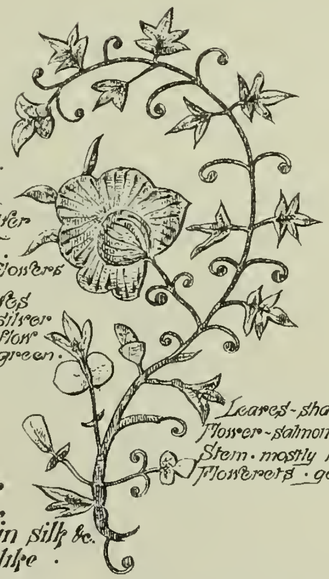


Italian
Embroidered Border
brown thread on white ground
· 17th. century
· 6 ins. wide ·



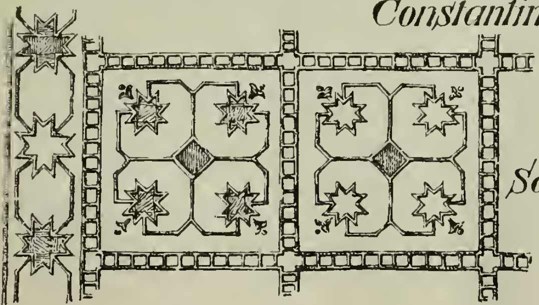
·in the Border ·
Lines _green
Diamonds &c. –
salmon with silver
centres
·in the Pattern ·
Outer part of flowers
salmon · · ·
Centres of leaves
and flowers · silver
Lower part of flowers and stalk · green ·

Constantinople Scarf,
embroidered in silk &c.
both sides alike ·
15th. century ·



Leaves-shaded blue ·
Flower-salmon, Do. and gold–
Stem · mostly brown
Flowerets · gold ·

Persian Work
embroidered in silk
and gold, both sides alike
18th. century ·



Salonica Silk
Square ·
both sides alike ·

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

· Old Embroidery · · John B. Gass · Delt ·

ARTISTS' HOMES.—No. 8: MR. VAL. C. PRINSEP'S HOUSE, KENSINGTON.

NEXT to Sir Frederick Leighton's house, which furnished the subject for our last "Artists' Homes" drawings, is the interesting studio which we illustrate to-day. This residence and studio for Mr. Val. C. Prinsep, A.R.A., was built some fifteen years ago from the designs of Mr. Philip Webb, an architect whose connection with the revival of simple brick architecture for domestic purposes dates probably earlier than that of many whose names are more generally associated with the movement. This house, in fact, was the first artist's house of its kind erected in London, and therefore our illustrations of it have a special interest. The general character of the design facing Holland Park-road is well suited to a street-frontage, and is conspicuous for an entire absence of ornament, depending chiefly on the singularly recessed oriel over the arched area, which continues up to the first floor, and on the pointed-arch entrance-porch, for its effectiveness, the whole design on this elevation being governed by a projecting cove or cornice, which is covered by red pantiles in a singularly original manner. Of the garden-front we need say but little, inasmuch as the view herewith published will enable our readers to study it for themselves. The plans accurately illustrate the house, and show an ingeniously worked-out example of what may be developed within the lines of a rigidly square plan. The chief entrance is by the acutely-pointed arched porch already referred to, and rising up a flight of some seven stone steps. This porch is vaulted over in red brick, and has a quaint little window on the east side. The front door is simply of plain boarding on the face, without panels or apparent constructive framing. A fine old bronze knocker, enriched by dolphins, and a nude statuette, of Italian character, in its centre, form the only relief or furniture provided beyond the thin brass loop handle with which the door may be pulled to on leaving. Entering the lobby, a waiting or garden-room is conveniently placed for visitors, or for business transactions. The back staircase, well screened, is planned for ready service both to the dining-room as well as entrance. Leaving the lobby, a spacious and well-lit hall offers a thoroughly homelike reception, furnished as it is with quiet hangings and parlour-like chairs and side-tables. In the centre a well-grown Indiarubber plant flourishes in a remarkably big Japanese pot in blue, and on the walls, besides a series of large photographs from the old masters, is hung a handsome collection of old plaques in blue as well as colour. Indeed, Mr. Prinsep has made old china a very favourite hobby, and the specimens which he has brought together show to advantage in his hall and staircase at Kensington. This latter feature in the house may be said to be specially successful, and notwithstanding the many winders, the stairs are "easy going" and spacious. On the angle shelves, or rather small corner landings, stand two handsome brass pots, of grand dimensions, and instead of a balustrade below the handrail, the space is filled in with plain boarding and covered with Japanese leather-paper. Mr. Prinsep was one of the earliest to use this material, and obtained it specially from Japan, using it throughout the house for the principal room-door panels and for dadoes. At that time Japanese leather-paper could only be had in small squares, and so its original quaintness for large surfaces is greatly increased by the varied character and colour which the many small sheets insure—a variety which is almost entirely lost when continuous paper, such as that now imported from Japan, is used. Plain clear glass is employed for the staircase, as to all the windows, which are everywhere draped with Morris-like patterned stuffs and short cottage or hour-glass blinds. Beyond the staircase a doorway is built in, for future extension. The drawing-room occupies the apartment originally used, and so figured on our plan as dining-room. This chamber is of good size, being 18ft. 3in. by 15ft. 1in., exclusive of the deeply-recessed bay, which is most happily treated with seats and a cupboard by the side of the fire-place. The walls are hung entirely by rich and old Italian tapestry, bought by Mr. Prinsep when travelling in Italy. Blue plates are arranged over the opening to the bay recess, and wood brackets and a girder form a sort of alcove at the entrance end. The furniture agrees with the character of the room, but calls for no special remark beyond, perhaps, the little point which strikes one as being unusual in houses of this kind—namely, that the framing of the cane-bottomed chairs is entirely gilt. The mantel-piece is of painted wood, in dark green, like the rest of the joinery, and one of Mr. Philip Webb's well-known grate-fronts and tiles complete the fireplace. The side cabinets and tables are used for the display of many choice works of art, old china, and nick-nackeries, collected in India and from all parts of Europe, as well as from Japan. The small room next the last, called, on the plan we give, a bedroom, and at first so used, is now occupied as a dining-room. It is of snug proportions, and with its old Chippendale chairs and sideboard, is exceedingly comfortable. The bedroom on this floor is roomy and spacious, the bed being cosily recessed in the inner division, as it were, of the room. The main idea of the house concentrates, of course, in the studio, which is 40ft. long by 25ft. broad, having besides this an adjoining room, connected by big folding-doors, reaching the entire height. Considerable extra space is thus available, and it was here that Mr. Prinsep's huge picture, exhibited this year at the Royal Academy, of the "Delhi Imperial Assemblage, held by Lord Lytton," was painted. The canvas in that case had to be fixed to a strainer, composed of three distinct frames, so that each portion of the picture might be brought directly towards the light to be painted, and this was managed by folding the three frames backwards triptych fashion, and when completed, the picture was opened out, and tightly strained by means of rails behind. The upper parts of the canvas were painted from the gallery, the drawbridge allowing the work to be carried through both rooms, while the gallery front at this part folds back, as shown by our second-floor plan and C. D. section, leaving a clear passage. The studio has three large windows on the north side, with an oriel at the end, and all these are seen in our perspective view. A top light is arranged over the central north window, and a second skylight is provided in the centre of the ceiling, but this latter is not often used. A store-room, for artists' properties and studio lumber, is arranged on the second floor, and reached from the gallery. The third window to the east is made to take out, for the removal of large paintings. A dressing-room adjoins the ante-room, and the back-stairs to the servants' rooms are planned behind. Models usually come up the main staircase. The woodwork in the studio and house throughout is painted a dark brown, of no particular tint, and the walls are papered with Morris papers. The studio walls are distempered salmon-red, and the gallery-front and columns are of oak, unvarnished. The heating is by means of open grates, hot-water pipes having been given up as a failure. The gas-lighting is by two sun-burners, and a second glazing in large sheets is used for the big windows, to exclude, as much as possible, the cold air in winter. The kitchen and offices are arranged in the basement, which is carefully shown, both by the sections and plan. Red brick is entirely used for the walls of the house, and red tiles for the roofs. The external woodwork is coloured white, and the ironwork a dark brown. The railing next the street is very massively treated, and looks unquestionably well, although it is entirely plain. Some alterations have been made since the house was built; but as now illustrated it cost rather less than £3,000. Our view is from a photograph taken for us specially by Mr. Bedford Le Mere, and we are indebted to the architect for the particulars from which our general drawings were made.

NEW HARBOUR AT SUNDERLAND.

A NEW lock and deep-water channel, which have been constructed by the River Wear Commissioners in connection with the Port of Sunderland, were opened last week. The works consist in the conversion of the southern outlet from a half-tide basin to a lock, with a channel to match, through which vessels may enter or leave the docks at all times and under all conditions as to weather. The new lock is 480ft. long and, for the greater part of its length, 95ft. wide. The depth of water in it is 30ft. at ordinary tides, and it is filled and emptied by means of sluices. The inner gateway forming the connection between the lock and the dock has a single pair of gates, and is 65ft. in width with a depth of water in ordinary tides of 25ft. 6in. The outer end of the lock is connected with the sea, and here there are 18in. more water, and a double pair of gates, supported by strut gates, which are said to possess great advantages over the old system of sheering up. An additional protection against the sea is provided by the erection of two wave-screens extending seawards, curving towards each other, and finishing with round heads, between which there is a channel, 80ft. in width. The lock walls are from 14ft. to 16ft in thickness, are faced with granite coped with heavy freestone copings, and backed up with concrete. In addition to these works a massive hydraulic swing-bridge has been placed across the inner gateway, and the southern outlet channel has been deepened, so that large vessels may not run any risk in arriving or sailing.

BOOKS RECEIVED.

Decoration is the title of a new sixpenny monthly, published by Messrs. Sampson Low, Marston, and Co. It is illustrated by Victor Barthe, T. E. Collcutt, F. G. Knight, J. Moyr Smith, B. J. Talbert, and others, and deserves to succeed. The size of the page might have been larger with advantage.——The Rev. John Twisden's *Elementary Introduction to Practical Mechanics* (London: Longmans, Green, and Co.) is the sixth edition, considerably improved, of a most useful and reliable manual.——*The Laws of Health*, by W. H. Corfield, M.A., M.D., F.R.C.P (London: Longmans, Green, and Co.), is issued as one of the London Science Class-books—a new scientific series edited by G. Carey Forster, F.R.S., and Philip Magnus, B.Sc., B.A. It is simply written and comprehensive.——*Dwelling Houses: their Sanitary Construction and Arrangements*, by the same author (London: H. K. Lewis), is a reprint of the recent series of Cantor Lectures delivered by Dr. Corfield before the Society of Arts.——A European edition of *Harper's Magazine* is projected, to be published by Messrs. Sampson Low and Co., London. The illustrations are a chief feature of this monthly, which, in its 160 pages, gives commonly from 70 to 100 wood engravings of a high art standard, as well as of popular interest. The magazine is to be issued here at a shilling, which is much less than the American price.——*Quantities*, by Banister Fletcher (London: B. T. Batsford), is a third edition of Mr. Fletcher's well-known Text-book for Surveyors. It has been revised, and four supplementary chapters added on Cubing, Priced Schedules, Forms of Fair Bills, and the Law as it affects Quantities.——*The Plumber and Sanitary Houses*, by S. Stevens Hellyer (London: B. T. Batsford), has reached a second edition. Some new matter is added.

CHIPS.

The total cost of restoration of Halifax Parish-church was paid off last week, and amounted to nearly £20,000. Of this sum, it is reported on the balance-sheet, that £13,200 was paid to the contractor, Mr. J. Thompson, of Peterborough; £1,800 for organ, to another firm; £1,200 for lighting and heating apparatus; restoring bells, £50; and sundries £3,000. The architect was the late Sir Gilbert Scott, and more recently Mr. J. O. Scott.

The parish-church of Seavington, St. Mary, will be reopened by the Bishop of Bath and Wells on Thursday next, after the completion of reseating and other works of restoration.

A picturesque ancient dwelling, known as Danesbury House, at the top of Timber-street, Elland, one of the buildings illustrated by Mr. Leyland in his recently-published "Views of Old Houses in Halifax," is being demolished at the present time. The front was partially of oak half-timber work, but had recently shown signs of decay.

The Corporation of Dorchester made, on Tuesday week, an official inspection of the new works for water supply. These include a boiler of 40 horse-power, engine, and machinery, all supplied by the Coalbrookdale Iron Company, and an elevated reservoir holding 100,000 gallons. All the works have been carried out under the supervision of Mr. Thomas, borough surveyor, at a cost of about £6,000, and the supply is ample, and capable of reaching the highest points of the town.

A new passenger-station has just been complete, at Jarrow-on-Tees. Mr. Whaley, of Durham was the contractor.

ARCHÆOLOGICAL.

Rousay, Orkney.—Some researches have just been made on the farm of Corquoy, in the valley of Sourin, Island of Rousay. Immediately above the farm house a group of mounds is situated, locally known as "Manzie's" mounds—a corruption of Magnus—and supposed to mark the site of a burial-place. These are five in number, the largest being irregularly surrounded by four smaller. On carefully trenching the mounds, each was found to contain a stone burial-place, consisting in every case of a top and bottom stone, with four side stones, the whole neatly cemented with tempered red clay, probably from the Sourin Burn. The stones, which were of a flat but massive description, had partly their edges roughly chipped into form, possibly with some stone implement. The fresh appearance of the stones and workmanship was especially noticeable, and the firmly-set masonry was further strengthened by irregular blocks placed as buttresses to support the superincumbent weight. The measurement of the largest mound, which was the most interesting, and with the internal details of which the others closely corresponded, was—outside circumference, 50ft., and top, 5½ft. from base; inside of burial-place, 2½ft. by 2ft., and 1½ft. depth. The centre of the cavity was almost filled with what seemed to be clay mixed with very minute fragments of bone, and the action of fire was clearly visible on the stones, as well as on some calcined substance—probably peat. Imbedded in this clay an oval vessel was found, heaped also with similar fragments of bones, &c., and resting mouth upwards, lengthways north and south. The material of the vessel is uncertain. Two of the other mounds contained burial-places rather squarer in form than the above. The smallest one measured only 12 by 6 inches, and no cement seemed to have been used in its construction.

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ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—A visit to London in the autumn, to partake more of a private nature than a public one, having been proposed at the late congress of the above society at Devizes, to enable the country members attending that meeting to inspect some of the most celebrated antiquities of the City and immediate neighbourhood, a large party, under the guidance of Mr. John Reynolds, were met on Monday at the Chapter-house, Westminster Abbey, by a sub-committee of the association and other members of the general body. Mr. Micklethwaite proceeded to point out the most ancient architectural features of the Abbey buildings and its precincts, and led the party to the remains of the old fratery, the infirmary chapel, and Jerusalem Chamber, besides other parts of the famous monastic establishment, illustrating each place visited by historical and clearly-expressed descriptions. At the close of the lecture in the Dormitory, and after a lengthened visit to the Abbey itself, where Edward the Confessor's shrine, Henry VII.'s Chapel, and the Royal tombs, &c., were inspected and described by Mr. Micklethwaite, and some remarks made by Mr. Loftus Brock, F.S.A., on the earliest building of the Abbey, a vote of thanks to Mr. Micklethwaite, proposed by Mr. Wright, F.S.A., was carried unanimously, and then the party, led by Mr. George Patrick, the acting hon. secretary of the sub-committee, proceeded to pay a short visit to St. Margaret's church close by. After visiting the crypt of St. Stephen's chapel the archæologists proceeded to Lambeth Palace. Here they were met by the librarian, and conducted through the edifice. A visit was also paid to the parish-church of St. Mary. In the evening the members dined at the Freemasons' Tavern, Earl Nelson, President of the Association, occupying the chair. On Wednesday morning the members of the party assembled with some of their London friends, to continue their inspection of the City antiquities, and commencing at 11 o'clock with the Church of St. Saviour, Southwark, which was described by Mr. E. P. Loftus Brock, F.S.A., they proceeded to complete their day's programme. Visiting the Guildhall and the crypt of 15th century date, which Mr. Brock exemplified as one of the few now remaining in London to which access was possible, they next visited the church of St. Bartholomew, in Smithfield, Mr. Brock again acting as cicerone. Afterwards the party proceeded to the Charter-house, where Mr. George Lambert, F.S.A., gave an account of the origin of the Carthusian Orders, and then described the special features of the buildings and the historical episodes connected with them. The visitors next proceeded to the old gateway of St. John's Priory, in Clerkenwell, where Mr. George Patrick read a short account of the origin and history of the priory, and described the architecture and armorial bearings surmounting the arch on both the north and south fronts. Mr. Patrick then conducted the party to inspect the crypt beneath the present church of St. John, and which he said originally formed a part of the crypt of the choir of the old Priory church. An interesting discussion arose as to the date to be rightly assigned to this fine work, which was generally admitted to be of a very early period, probably the remains of an earlier building incorporated with the Priory Church by the Knights Hospitallers. A visit to the Temple Church, where Mr. Brock gave a sketch of its foundation and history, brought the day's work to a close.

Sussex Archæological Society.—The autumn excursion of the Sussex Archæological Society took place on Monday, when the parish-church of Our Lady, West Chiltington, was visited. Mr. Thos. Jesson, of Nutbourne, read a paper, in which he traced the history of parish and church, which shows examples of every style, from Early Norman to full-developed Perpendicular. The building is now dismantled for restoration; the roof is removed from chancel, the galleries are being pulled down, whitewash and plaster are being scraped off the walls, revealing some interesting mural paintings, and the pews have been cleared away to make room for the intended new benches. The work, which will involve an outlay of £700, is being carried out by a local builder under the direction of the joint architects, Mr. R. Creed, of London, and Mr. Dalby, of Steyning, the latter of whom explained to the visitors the architectural features of the building, and the nature of the proposed works.

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SCHOOLS OF ART.

Reigate.—The annual meeting for prize and certificate distribution was held on Monday week, at the Reigate public hall. The annual report commenced with a reference to the serious loss the classes had sustained by the death of Mr. Robert Hesketh, F.R.I.B.A., the late chairman of the classes, to whose untiring energy, personal interest, and attention, their present position was largely due. The results of the May examinations were that in the art classes of 45 presented for examination, 13 obtained passes, and 4 were certified as excellent; in science, 74 were presented, of whom 50 passed in the second, and 11 in the first class. Two third-grade, and six second-grade prizes were taken in the class for building construction. There had been a falling off in the art classes, but a steady increase both in numbers and in successes in the science classes. The prizes and certificates were then distributed by the chairman, Mr. R. Lempriere Hesketh.

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COMPETITIONS.

Croydon Board Schools.—The school board for Croydon, on the 19th inst., agreed to instructions for a limited competition for proposed new schools on the Limes Estate; accommodation must be provided for 720 children, and the cost of erection is not to exceed £5,400. Each member of the board having named an architect, the following were announced to have been selected for invitation to compete:—Messrs. Simpson, Rutley and Blackwell, Cecil, Brooks, Bell, Matthews, Elliott, Greenhouse, Paull, Steel, and another.

Halifax Higher Board School.—The school board for Halifax met in committee on Monday week to examine the plans submitted in competition for the proposed Higher Board School, when those sent in under the device "Blue Cross" were selected. The board afterwards formally adopted the plans, which, on opening the sealed envelope, proved to be by Mr. Richard Horsfall, of George-street, Halifax.

Westminster Vestry Offices.—At a meeting of the united vestry of St. Margaret and St. John the Evangelist, Westminster, held on Monday afternoon, a report was presented by the parochial offices committee stating that they have returned all the competition designs for the new offices to their authors, except the premiated ones, and that the incidental expenses of the competition amounted to £391 7s. 6d. Having had an interview with Messrs. Lee and Smith, to whom the first premium was awarded, they recommended that Messrs. Lee and Smith be employed by the vestry as architects for the proposed parochial offices, at a commission of 5 per cent. upon the total amount of the work to be executed under their direction, such sum to cover the premium for the designs submitted, and to be inclusive of any preparation of new plans which the vestry or the parochial offices committee may require. They also recommended that the plans submitted by Messrs. Lee and Smith be forwarded to the Local Government Board as a general outline of the buildings contemplated by the vestry. These recommendations gave rise to considerable discussion, several members protesting against intrusting power to a committee to materially alter the selected design; but the chairman of the committee said that no deviations were contemplated other than those necessary to adapt any mere competition design to be placed in the hands of a builder as working drawings, and by 23 votes to 8 the report was adopted in its entirety.

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CHIPS.

The annual distribution of prizes to successful students in the Sherborne, Dorset, School of Science and Art took place on Monday week. The report showed that by the 75 students 23 Queen's prizes and 51 certificates had been gained at the May examinations.

The united Vestry of SS. Margaret and John, Westminster, on Monday accepted the terms of Messrs. Hunt and Steward, Westminster—viz., 100 guineas—for the valuation of parochial property in Marloes-road, Kensington. It was stated that the original offer of Messrs. Hunt and Steward, 15s. per cent. on the valuation, would have involved an outlay of between £400 and £500, but that a proposal to invite other estimates resulted in the tender now accepted.

The Croydon school board held their meeting on Tuesday week, in the recently-erected offices. Mr. Hobbs was the contractor, and the furniture was supplied by Mr. A. C. Ebbutts; the total cost was £3,064.

The foundation-stone of St. James's Episcopal Church, at Springhead, N.B., was laid on Saturday. The church is Gothic in style, and is being built of red bricks, with black brick bands and string-courses, and door and window jambs of moulded red bricks. The architect is Mr. S. Gibson, of Glasgow.

The foundation of the new free library and schools of science was laid in Trinity-street, by the Mayor of Cardiff, on Wednesday. The plans were chosen in a competition, in which about 100 architects took part, and are by Messrs. James, Seward, and Thomas, of Cardiff. The contractor for the buildings is Mr. Richard Roberts, of Cardiff, whose tender was accepted at £7,896, the competition limit of cost having been £8,000. We illustrated the buildings on April 23rd of the present year, by a perspective and ground and first-floor plans.

A Local Government Board inquiry was held at the Town Hall, Tunbridge Wells, on Thursday week, before Mr. Arnold Taylor, inspector, concerning the proposed erection by the local board of a bridge across the South-Eastern Railway, near the goods station, so as to afford direct communication between the Camden and Upper Grosvenor-roads districts. Mr. W. H. Brentnall, engineer to the local board, produced the plans and designs, and stated that actual tenders for the erection of the bridge, which would be 34ft. wide, showed that the total cost would be £10,000, the chief items being brickwork, £4,648 14s. 8d., and ironwork, £3,794 4s. 9d. No opposition was raised to the scheme.

The parish-church of Great Ness, near Oswestry, was reopened on Thursday week after restoration, effected at a cost of £800. The roofs have been retiled, the walls strengthened by buttresses, and half an unsightly gallery removed.

A new reservoir has just been completed at Abbeystead for the waterworks committee of the Corporation of Lancaster. The work has been carried out under the supervision of Mr. Fleeming, the waterworks manager.

A stained-glass window, having as its subject "Christ healing the Sick," and a brass tablet have just been placed in Hurstmonceaux Church to the memory of Major Greenaway and his children. The work was executed by Messrs. Gibbs and Howard.

Building Intelligence.

Barnwell, Gloucester.—At the Gloucestershire Quarter Sessions, held on Tuesday week, a report was presented with reference to the proposed County Lunatic Asylum at Barnwell, for which the designs of Messrs. Giles and Gough, of London, were selected in competition. It stated that the approach-road was nearly complete, Mr. King being the contractor, and a contract had been made with Mr. Coleman, at £1,243, for the erection of four cottages, the first expenditure on building. The architects had received instructions for the immediate alteration of the existing farm buildings, so as to accommodate 18 patients, and the drawings and specifications for the main building were now nearly ready for tenders to be advertised for. The committee of visitors were authorised to accept tenders, and sums amounting to £12,000 were placed at their disposal.

Ipswich.—The foundation-stone of the new Corn Exchange was laid at Ipswich on Friday last. The contract for the erection of the buildings has been taken by Messrs. Grimwood and Sons, of Sudbury, at £21,950. The design is that of Mr. Brightwen Binyon, of Ipswich, having been chosen by the committee of the Corporation from 15 sets of plans sent in in competition. It provides not only for a large Corn Exchange, and for municipal offices in connection with the Town Hall, but also for a belt of shops round the main building. The style of the buildings is Italian Renaissance. The Exchange will be 120ft. long by 58ft. broad. The walls will be of white brick, divided into bays. The floor will be Homan's patent flooring, iron girders, and concrete, with a pavement of wooden blocks. For ventilating purposes four large Boyle's extractors will be placed in the roof, and there will be inlets at the windows. We have illustrated the building by a perspective of the King-street front and a view of interior of exchange.

Metropolitan Board of Works.—At the recent meeting of this board a deputation from the Local Rights Association for the Promotion of Rental and Sanitary Reform, presented a memorial on the subject of dwellings for the working classes, in which it was stated that the benefits proposed to be conferred on the working classes by the Artisans' Dwellings Act of 1875 had not been obtained, in consequence of the limited power conferred on the board, and the delegation of the responsibility of building dwellings for artisans to speculative builders. They urged the board to apply for Parliamentary powers to enable them to erect suitable dwellings and to hold such dwellings in perpetuity, letting the same to tenants at the lowest possible rental. Mr. Keates, a working man, supported the memorial in an address in which he dwelt upon the hardships occasioned to his class by the demolition of artisans' dwellings, and asked the board to remedy the defects in the Artisans' Dwellings Act. The memorial was referred to the works committee, as was also one having reference to the Deptford Bridge improvements. A report was received from this committee as to the Temple Bar memorial, stating that the site was under the control of the City authorities, and that the board had therefore no jurisdiction in the matter. Dr. Brewer moved an amendment deprecating the erection of the memorial, and in reply to a question as to how the board could make its power felt by the City authorities suggested that they should refuse money in aid of improvements. A discussion ensued in which the memorial was generally condemned, and the desirability of having one supreme authority for the metropolis was suggested; the amendment was, however, negatived by 21 to 6, and the committee's report was adopted. The works committee brought up a report on the recent letter of the Home Secretary as to the working of the Artisans' Dwellings Act, in which they recommended that board to make application in the next session of Parliament for power to enable the board to erect dwellings for the accommodation of persons of the labouring classes dispossessed by the said Act and also for an amendment, alteration, or repeal of Section 33 in the Metropolitan Streets Improvements Act, 1877, by which section the board are precluded from taking more than 15 houses until sufficient accommodation is produced elsewhere for the labourers displaced. The report gave rise to a discussion which was adjourned for a week. On Friday a joint deputation from Lewisham and Plumstead District Boards of Works presented a memorial on the subject of the drainage of the districts affected by the rising of the Ravensbourne and Quaggy rivers. The deputation stated that the local authorities could not agree as to the best course of action, and had, moreover, no compulsory powers of purchase; and urged the Metropolitan Board to take the matter in hand, and provide a scheme for remedying the floodings. The matter was referred to the works committee. The debate was resumed on the report by the works committee on the difficulties attending the provision of accommodation for the working classes displaced under the Metropolitan Streets Improvements Act, 1877. The works committee recommended that the Board apply "for power to erect dwellings for the accommodation of persons of the labouring class displaced by the operation of the above-named Act," and also for the amendment, alteration, or repeal of the 33rd section of the Act. Mr. Selway proposed as an amendment that the words enclosed above in inverted commas be omitted, and this was carried by 19 votes to 17, the majority of the members being unwilling that the Board should enter upon building speculations. As to the Artisans' Dwellings Act, it was resolved to be undesirable to submit any more schemes to the Home Secretary till the Board had recommended such amendments of the Act as may appear necessary. A report was presented by the Bridges Committee as to the proposed reconstruction of the bridges at Battersea, Putney, and Deptford-creek, and it was resolved (*a*) that the new bridge at Battersea be built as near to the site of the existing bridge as is practicable, at an estimated cost of £220,000; (*b*) that the new bridge at Putney be built near to and parallel with the present aqueduct, at an estimated cost of £376,000. The former bridge is to be 44ft. wide and the latter 40ft., and the aqueduct of the Chelsea Water Company is to be rebuilt inside the new Putney-bridge. A letter was received from the town clerk stating that the system of fire-hydrants, which number 818, in the City of London, is now complete; referred to the fire brigade committee.

Sheffield.—The parish-church of Sheffield was reopened on Tuesday after restoration. The cost of the work has been about £16,000. Mr. Flockton, the surveyor to the church burgesses, prepared a report, which was submitted to the late Sir Gilbert Scott, and having received his approval, the alterations and additions therein recommended have been carried out. The improvements have comprised the complete removal of all the old galleries and pewing, and the substitution of a more modern style of seat; building of two new transepts, one on the south, and another to correspond on the north, each 22ft. 4in. by 17ft.; extension of the nave towards the west 25ft., giving a total length to the church of 175ft. It also includes two porches, north and south, and another in the centre; raising of the chancel-floor several inches, and paving the greater portion with encaustic tiles; removal of the organ into the space formerly occupied by the vestry and church burgess room, in the north-east corner of the chancel; building of new vestries and burgess room at the north-east corner of the church; removal of the plaster, and the renovation of all the stone-work. The Shrewsbury chapel and the monuments it contains have been thoroughly cleaned and made good, by the instructions of the Duke of Norfolk. Messrs. Chadwick and Co., of Masborough, are the contractors for the whole of the builder's work, the carving having been executed for them by Mr. Milburn, of York. The oak fittings in the chancel have been furnished by Messrs. J. and G. Shaw, of New Mills; the gas-fittings by Mr. Wilson, of Sheffield; the elaborate standards of brass having been made for him from the architect's designs by Messrs. Smith and Son, of Deritend Works, Birmingham. The warming apparatus is by Mr. R. R. Gibbs, of Liverpool; the tiles are from Minton, Hollins, and Co.; the organ, with its elaborate oaken case, is from the establishment of Messrs. Briudley and Foster, of Sheffield.

The New Princess's Theatre.—This theatre, the rebuilding of which is now approaching completion, has been erected for Mr. Gooch, from the designs, and under the immediate superintendence of Mr. C. J. Phipps, F.S.A., architect. The opening of the new house is advertised for Saturday, October 30th. The theatre proper, that is to say the auditory, will not occupy a larger area than originally, but the stage, and all the approaches and dressing-rooms entirely external to the auditory, are increased in area fourfold. The disposition of the buildings may be thus classified, as they really form distinct blocks, separated one from the other by solid walls, and arranged with a view to lessen the risk of fire spreading in case such an event should ever occur:—1. The theatre proper, including auditory, stage, scene-docks; 2, the approaches from Oxford-street, with saloons and staircases; 3, the approaches from Winsley-street, for pit and gallery; 4, the dressing-room block in Castle-street. The total area of ground covered by the various blocks of buildings is 21,000ft. superficial, or only 1,000ft. less than the area of the Royal Italian Opera, Covent-garden. A special feature of the arrangements is a separate transfer staircase from the highest level of the gallery to the ground level of the pit. On every floor, however, the audience have available access to at least three distinct staircases, all fireproof, and leading directly into the streets. The very best arrangements, therefore, are made for the safety of the audience. The auditory is also separated from the stage by a solid brick wall nearly two feet thick, and this is carried up above the roof; and there are numerous fire hydrants in the various corridors all charged from the high pressure mains in the streets. The general ornamentation of the theatre is French Renaissance, the fronts to the several tiers being richly moulded and gilded, the proscenium boxes being specially rich both in design and ornamentation. The general arrangement of colour is a cream ground, light on the ceiling, on which the decorative ornament is painted in colours, and gradually deepening towards the lower parts of the auditory. The walls are covered with a crimson flock-paper, while the walls of the private boxes are of green and gold, the hangings and curtains being silk tapestry of deep crimson. The general colour of the seats is a dark maroon. Over the proscenium, and in the groined spandrels on either side, is an allegorical figure subject representing the Arts allied to the Drama, painted by Ballard. The traditional green curtain will be adopted, and Mr. Beverly is painting, as an act-drop, a tapestry curtain. The frontage in Oxford-street, 21ft. wide, is of Portland stone. It has wide pilasters on the ground floor, the entrance between being 17ft. wide. Mr. Mark Manley has been the general contractor, Messrs Drake have erected the concrete staircases, Messrs Geo. Jackson and Son have prepared the box-fronts, proscenium, and ceiling in their fibrous plaster; Messrs. Campbell and Smith have executed the painted and stained-glass for the entrance vestibule screens, and the smoking-rooms and various other places, and the entrance vestibule and crush-room are laid with marble mosaic by W. H. Burke and Co., of Newman-street. The ornamental gates are by Messrs. Cottam and Co., of Winsley-street. Mr. Edward Nightingale has been the clerk of the works for the architect.

Willingham-by-Stow.—The church of St. Helen, Willingham-by-Stow, Lincolnshire, has been reopened after rebuilding. The new church consists of nave, 44ft. by 22ft.; chancel, 24ft. by 16ft.; transept, to be used as vestry and organ-chamber, and porch. The tower, which was a low one, of the same date as the old church, has been raised some 20ft., and has had four Decorated two-light windows inserted in the belfry stage, and some of the remains of the pinnacles have been reused. The corbels to the internal arch are carved with figures of St. Helen, with the Holy Cross in her hand, and St. Mary. The roofs are covered with Staffordshire tiles, and the inside being open-timbered, and stained and varnished, with curved ribs and moulded cornice. The floors are laid with encaustic tiles throughout, the sacrarium being glazed. The pulpit has a Steetby-stone base, the upper part being of brass work, with an oak rail. The altar-rail, standard, lectern, corona, and brackets are also of brass, and have been executed by Messrs. Hart, Son, Peard, and Co., of London. The credence table is of Caen stone, and richly carved. The contractors are Messrs. Dennison and Son, of York, and the architects Messrs. Smith and Brodrick, of Cogan Chambers, Hull.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Edward Reid. (We see no good likely to result from continuing the controversy further.)—J. P. (Good plans before everything, then good elevations; but an architect worth the name will give you both together, and not distort plans to suit elevations, or vice-versâ.)

Correspondence.

TRAPLESS CLOSETS AND DRAINS.

To the Editor of the Building News.

Sir,—My third question in to-day's Building News is not correctly printed. It should be

3. How many where the continuity of the drain was not broken?

Kindly correct and oblige.—I am, &c.,

Ernest Turner.

London, 264, Regent-street, Oxford-circus, W.
22nd October, 1880.

Sir,—I am obliged to Mr. Turner for the friendly tone of his letter of the 16th inst., and in reply to his inquiries beg to lay before him the following information.

1st. I have no interest whatever in the sale of any description of trapless closet, my previous statements being, as he justly remarks "the result of honest conviction," based upon practical experience.

2nd. I have had fixed over 60 trapless water-closets, after previously taking down and doing away with the old pan apparatus, with their containers and detestable lead D and P traps, principally in the dwellings of medical practitioners, and, in two instances, as many as four in each house. I have also had numerous opportunities for seeing and ascertaining the reliability of these closets which have been fixed by others.

3rd. The continuity of the drain was, and should, not be broken in any case whatever. A water-trap fixed between the house and the sewer is perfectly useless, the gases from the sewer being either forced through under pressure, or absorbed by the water on the sewer side, and discharged on the house side of it. If the continuity of every house-drain emptying into a public sewer was preserved, such drains would form ventilating flues for the escape of the gases of decomposition accumulating in the sewer, which would be carried off at a higher level by the ventilating pipes above the house-tops, and afford greater facilities for the gases to be diluted and blown away, than it would obtain from openings at the ground level. Dr. Corfield, in his admirable work on "The Treatment and Utilisation of Sewage," p. 153, says: "In Southampton gratings in the road gave off such offensive effluvia that the inhabitants of the neighbouring houses stopped them up with pieces of wood, the result being that the gases forced themselves up through the imperfect traps into the houses." Taking all things into consideration, if the gas from the sewers is conducted towards the house, whether there be a disconnecting trap or no, where is the benefit of it? In addition to the numerous disadvantages already mentioned, it also tends to obstruct the ventilation of the sewers. Mr. Stidder, in his system, ventilates the sewer by means of vertical tubes at the sides of the house; but there appears to be a multiplicity of pipes with his arrangement, whereas practical experience proves one to be abundantly sufficient for the purpose. One tube of 4in. or 5in. diameter acting as a soil and ventilating pipe (above the topmost water-closet, it ceases to act in the capacity of a soil-pipe and becomes a ventilator only), continued up its full diameter above the roof of the house, terminating with a plain T top, and having an inlet for fresh air at its foot, will be amply supplied with a sufficient upward current to prevent the formation of foul gases in the pipe itself, and also to carry off those which are formed in the drain. A few small pieces of paper inserted at the inlet were carried up and seen to fly out at the top, effectually proving the strong up-rush without the aid of any mechanical contrivance, which is always more or less liable to get out of working order, and become not only noisy but a nuisance.

4th and 5th. The closets alluded to have been fixed for periods varying from about four years to one month, during the whole of which time, with the exception of a new indiarubber seating or so (easy and inexpensive renewals), and a basin being cracked through a careless housemaid throwing some hot water into it in frosty weather, nothing whatever has been needed in the shape of repairs or adjustments. Fortunately the closet was one of Mr. George Jennings' manufacture, and the pan was easily replaced without disturbing the rest of the apparatus. I have never experienced the slightest disadvantage, or had any complaint made against these trapless closets; on the contrary, they appear to have given unexceptionable satisfaction. I may just mention, however, I have noticed that some closets having a flat plate valve at the bottom of the pan, not only catch and throw up a portion of the contents of the trap underneath it, but also hit back the incoming water in a very disagreeable manner to the user if he lets the handle drop suddenly, whilst the slightest obstruction between the valve and the bottom of the pan lets out the after-flush, which is not the case with the plug of the trapless water-closet.

In conclusion, I will add that unless the strictest personal supervision is exercised, any system, however good and correct in theory, is always liable to failure in practice through the carelessness or ignorance of the workman, many a good and useful invention has frequently fallen into disrepute from this cause alone, and not from any fault in itself.—I am, &c.,

G. A. Foster.

Sir,—Mr. Foster says, page 428, that "the flush of water always carries with it a strong down-rush of fresh air," and so prevents the escape of any foul air from the drain when the plug is lifted. He seems to forget that the discharge down the soil-pipe would have precisely the same effect and prevent any air rising; but, on the contrary, draw fresh air *down* the soil-pipe, which is left open at the top. Mr. Beattie, the plumber, takes advantage of this fact, and uses this pipe for the inlet of fresh air; the pipe for the outlet of foul air being placed at the other end of the drain, and not used for any other purpose.—I am, &c.,

Charles F. Moxon.

61, Bedford-gardens, Campden-hill, W.,
October 25th

Sir,—I have read Mr. Foster's remarks at p. 487, and beg to observe that some of his statements are incorrect—e.g., the closing remark in his letter, where he states that if a soil-pipe be ventilated at top and bottom, then no air will come into the house, although the plug of the trapless closet "be lifted." Now I have to state that, as closets are generally fitted up, lifting the handle would allow a certain quantity of foul air to rise up, more or less, according to circumstances, and especially if the water happened to be off.

The rush off of the water would cause a temporary rush-down of air after it; but, especially with a deficient water supply, that would soon cease, and then, unless the valve or plug were put back quickly and *tightly* into its place, the pull of the chimneys would suck sewer-air into the house.

I have said "sewer-air," because at p. 428 Mr. Foster very foolishly asserts that:—"The drain, soil, and ventilating pipes should form one continuous flue from the sewer to the roof of the house." In other words, that the soil-pipe should ventilate the public sewer, and the only safeguard betwixt the house and the sewer which Mr. Foster would allow is his wonder-working "plug," which he candidly tells us required renewing in the short space of three years!

I hardly think such a safeguard worth much in general practice, seeing it would entirely fail when the water happened to be off, and a piece of paper, &c., stuck under the plug; while, also, as I said before, this plug would be of no service as a safeguard if a hole happened to be made in the pipe below the plug. Mr. Foster is silent as to the effect this would have.

In "trapless closets," again, with water-trapped overflows, the word "trapless" is a misnomer; and, out of sight, the part where the plug works gets often furred, and stinks badly in time. Some of these "trapless closets" are also very high-priced, and, I consider, not worth half the money.

A simple wash-down closet, with siphon water-trap attached, and all above the floor, and without any working parts, may work satisfactorily for twenty, or twice twenty years, without any repairs, and be quite safe, in fact, far safer for the inmates than the more expensive plug or valve-closet without traps. Only I approve of the soil-pipe being trapped and ventilated *per se*, in which case, even although the sewer and drain be contaminated with particulate contagia, &c., none can get access to either the soil-pipe or closet from them.

To my own knowledge, many first-class engineers, plumbers, medical men, chemists, &c., are dead against ventilating the public sewer up their soil-pipes, and in first-class drainage works which I have been executing of late, the house drain has a special blow-off ventilating pipe—or pipes for itself.

Mr. Foster's statement, that siphon water-traps are a continual source of nuisance, is untrue, especially if they are properly shaped and properly put in. In this case they are a continual source of *safety*, and I put down my twenty-eight years practical experience against Mr. Foster's mushroom theories.

In reply to Mr. Arthur Billing, *re* Guy's Hospital, I readily admit that both now and for some years back, the "existing" fittings may be, and have been, working satisfactorily; but all that is *since alterations were made*, as stated in the newspaper I referred to. Mr. Billing finds fault with me for only quoting a part of the communication referred to. With your permission, I beg to give the whole of it.

DRAINAGE AT THE COAST.

(To the Editor of the *Glasgow Evening Citizen*.)

Greenlands, Egham, Sept. 29, 1880.

Sir,—In the *Evening Citizen* of 21st Sept. is a letter signed "Ozone," the gist of which is to advocate the abolition of all and sundry traps under w.c.'s, sinks, baths, basins, &c. If such a plan were adopted "Ozone" would soon find his *nom de plume* a misnomer, for most assuredly the reverse of ozone would find its way up the various pipes into the different chambers where untrapped sanitary appliances were fixed. I tried, according to orders, this panacea for all the evils resultant from the use of many traps, in a modified form, using one trap at the base of soil-pipe, leading wastes from sinks on alternate floors into same untrapped, and this at a no less important place than Guy's Hospital. *It ended in failure*, and need I say since that day I have not only abandoned the now exploded "one-trap" theory for a whole house, but should regard as akin to aberration of intellect the alternatives suggested by "Ozone." It would occupy too much of your space to enter into a scientific discussion of the utter impracticability of such a plan as advocated by your correspondent; but he should remember that in partly or wholly tide-locked sewers there is an everchanging barometric pressure going on, also that the perimeters of sewers are alternately wet and dry, and, further, that as water rises in them, reducing the air space, if only to one-half, it brings to bear upon the air a pressure equal to a column of water 34ft. in height, and this pressure would at once relieve itself up the untrapped pipes. I would say more, but hope I have said enough to deter anyone from trying this *Kari Karu* system of terminating his existence.—I am, &c.,

R. Barnes Austin, M.S.C.E.

I am, &c., W. P. Buchan.

IRON IN CEMENT.

Sir,—If you are not tired of "Iron in Portland Cement" I would fain say a few words in reply to Mr. Duke's letter in your last number.

Your correspondent disavows all feeling of alarm at the prospect of Portland cement being made without oxide of iron, and insists that its rejection by the manufacturer is impracticable and unnecessary, and quotes "a very eminent authority" to support his case.

I have endeavoured to show that Portland cement is best when it contains the least amount of oxide of iron, and this is confirmed by all reliable experience in this and other countries. Mr. Duke seems to imply that architects are indifferent about the materials they use; but I fear he pushes this doctrine somewhat too far when he insists that cements "in the bulk of cases are simply to last as long as the materials with which they are associated." The late Mr. Charles L. Francis (cement manufacturer), at the discussion before the Institution of Civil Engineers, in December, 1865, said (contending against the desire to improve the quality of Portland cement): "Portland stone crushed easier than the lowest experiments with Portland cement. Where, then, was the practical use of having a cement stronger than the material which had to be joined together? If the stone decayed what were the joints good for?" The cement test at that time was only about a third of the present requirements. Sir Joseph Bazalgette followed Mr. Francis in the discussion and said: "Then it had been argued that if the cement was stronger than the materials which it had to unite, it was not surprising that the manufacturer should be unwilling to raise the standard of quality. But he had yet to learn that any cement had been obtained which was 'too good.' When that pitch was arrived at, it could readily be diluted with a larger amount of sand, and its cost and its strength could be reduced at pleasure. It was the engineer's duty to raise the standard of quality; and when it had fairly been determined what was the best material, it would always command its price in the market, and that would determine the question which was the most marketable article to produce."

I trouble you with these quotations in case any of your readers should be misled by Mr. Duke's proposition for a retrogressive course in assessing the quality of cement by comparison with inferior materials of construction.

Mr. Duke's building experience, like his cement practice, must be confined within a limited circle, for it is opposed to all ideas of progress. Because iron is in cement now, it does not follow that it must continue to be a damaging ingredient for all time. The potter who desires to make the highest class porcelain or pottery carefully eliminates all iron in the clay under treatment, and by this comparatively inexpensive process secures a high price for his wares. Let the intelligent cement-maker follow the potter's example, and strive to improve the quality of cement by some similar operation. Mr. Duke may, by some special knowledge, be able to produce an "iron" cement which can compete with the best Portland in the market; and, if so, I trust that he may reap the reward which his intelligence in that case deserves.

The interchange of materials from one point to the other does not affect the question at issue, for if a manufactory is wrongly placed, the sooner it is shut up the better. Economical reasons are in favour of producing the best article, which, in the case of cement especially, would secure the highest price; and as the cost of carriage is as much for a bad quality of cement as a good one, it is folly to produce that which, in consequence, would be loaded with greater transit charges, while having a lower market value. The simple carriage of a ton of gold costs no more than a ton of silver; but the spending value of the one, at its point of distribution, is much greater than the other.

Mr. Duke's nearness to Manchester may have caused him to imbibe the cotton-spinner's ideas of cheap cost, and disregards weighting his cement with iron, so long as it pays. His brother manufacturers, however, do not use clay for weighting their cloths which contains iron; otherwise their dishonesty would ruin the fibre of the material, conveying to distant parts the adulterant that sometimes weighs more than the cotton itself. Such conduct of the cotton-spinner has shut him out of some markets, which are now only accessible by representing cloth from Manchester as being made in America. Do not let us encourage a faulty manufacture of English cement, which may eventually lead to our resorting to the necessity of calling it German to insure its reception in distant markets.

It is rather curious that this correspondence originated in the desire of an engineer to protect himself against "iron in cement," and closes (which I presume it will now do) by the determination of a manufacturer to insist upon its presence being, if not advantageous, at least unobjectionable.—I am, &c.,

The Writer of the Article.

GLASGOW MUNICIPAL OFFICES COMPETITION.

Sir,—I see that Mr. Barry's report is directed to lie on the table, and there it lies, whilst the committee try themselves to do what Mr. Barry was employed for. I give them credit for their earnestness. A duty is now, I think, incumbent on all the competitors who sought to obey the instructions, namely, to protest against Mr. Corson's design being allowed in the competition. He has disobeyed the instruction by colouring and shading. Not only was the rule explicit and positive concerning the style of drawings, but those persons who wrote to the officials on the subject were told imperatively that this rule must be adhered to. We should, therefore, protest against any favouritism towards Mr. Corson or any other person, and demand that the committee or magistracy abide by the rules which they themselves set up. Of course, it may be said that the rule as to cost has been broken. So it has, by all, Mr. Corson included. This rule was broken by the magistracy themselves saying that the money was not enough, &c., at their meetings. Mr. Barry, instead of supporting the rules, practically pooh-poohs them!—I am, &c., M.

FARM-PLANS AT THE DAIRY SHOW.

Sir,—The instructions of the Dairy Farmers' Association to competitors in this class, although brief, were clear and concise, the full text being as follows:—

"Models or drawings of dairy homestead for a dairy of fifty cows:—First prize, silver medal and £15; second prize, bronze medal and £10; third prize, certificate and £5. Entry fee: Members, £1 1s.; non-members, £2 2s. If a model, notice of the size must be given beforehand, and stands will be provided; if drawings, the set must be coloured, and include plans, sections, and isometrical view. In either case, the farm-house, piggeries, and all out-buildings must be given. Scale for drawings to be not less than $\frac{1}{8}$in. to the foot, details $\frac{1}{4}$in. Specification and estimate to be supplied."

It may seem somewhat strange, therefore, that after such very simple instructions the second prize should be awarded to a design for a farmstead with accommodation for 80 cows and with a proportionate amount of other buildings; but such is the fact, the exhibitor—one of the council of the society—having received first prize for the same plan in 1878, when the conditions were that the accommodation should be for not less than fifty or more than a hundred cows, and which plan was reproduced in the Building News for January 17, 1879.

The Dairy Farmers' Association should, I submit, be extremely careful that in the matter of competing designs for farm-buildings, no deviation from the conditions should be permitted. The *fiasco* at Kilburn in 1879 was followed by still worse treatment of competitors at the Dublin Show in the same year, when no prizes were awarded, the greatest difficulty existed in getting the plans returned, and replies to letters of inquiry were quite out of the question, and may possibly account for the indifference shown since that time by designers of farmsteads. At any rate, this would appear to be the case, if we may judge from the fact that although the Dairy Farmers' Association offered double the amount of money in prizes this year that they did last year, the result was only four entries against seventeen in 1879.

But a formal protest has been lodged against the decision of the judges in the present instance, the result not yet being determined. If the council uphold the award, and if in the future a matter of 50 per cent., more or less, of accommodation is to be at the discretion of competitors—although the conditions state definitely what accommodation is to be provided—a precedent will be established that must end in the said competitors being allowed—to use the words of quite a different competition that takes place in the same building at times—to "go as they like."—I am, &c., Thomas Potter.

CHIPS.

The Devonshire Hospital at Buxton is in course of enlargement, by which the accommodation will be increased from 150 to 300 beds for patients. A feature of the work is the erection of a large dome to cover the open space in the centre of the hospital. The dome is 150ft. in diameter, and in its construction about 600 tons of iron, besides timber and other materials, have been used; it is set upon a low and substantial building. The total outlay will be about £30,000.

The town council of Bath decided last week to add the Roman Baths, recently discovered by the borough surveyor, to the antiquities under the care of the committee of the Bath Literary and Scientific Institution, it being stated that every facility would be given for the access of the public. The custody of the Russell collection of maps and plans, which have been purchased by subscription, was accepted by the town council, and the collection has been deposited at the Institution.

New Sunday-schools are being added by the side of the Congregational church in the High-road, Lewisham; the buildings are being constructed of Kentish rag with freestone dressings, and are in character with the church. Messrs. Staines and Sons, of Great Eastern-street, Shoreditch, are the builders.

A memorial stained-glass window has just been placed in the Martyn chapel of Long-Melford parish-church, West Suffolk. The subject is the "Ascension of Our Lord," and it is the work of Messrs. Clayton and Bell, of London.

A correspondent of the *Sussex Advertiser* states that a new window now in course of construction at St. Michael's Church, Lewes, has unfortunately destroyed a portion of an inscription in dark-coloured flints running along the south front of that church. The characters can only with difficulty be deciphered, but an old history of Lewes gives the words as "Hail Mary! full of Grace. The Lord be with Thee."

A church dedicated to the Holy Trinity, at Rhosygwelia, Bala, erected 40 years ago, has just been rebuilt and re-opened. Mr. E. B. Ferrey, of London, was the architect.

A report by Mr. B. Baker, C.E., of Queen-square-place, Westminster, was received by the Gloucestershire magistrates last week at their quarter sessions, respecting the highway bridge at Over, one of Telford's works. The report stated that the thrust would in time destroy the bridge, owing to the failure of abutment foundations, and quoted from the original notes by Telford, the sentence, "I blame myself for the injudicious parsimony of omitting the pileing and platform (to foundation of eastern abutment) and mention this case as a useful caution to practical engineers." He proposed protective works, for which a responsible contractor had made an offer of £2,970. The matter was referred to a committee for consideration and report.

The Ossett local board have accepted an offer by Mr. Paterson, their engineer, to carry out a drainage scheme for Gawthorpe, at a remuneration of 3 per cent. on the outlay.

Intercommunication.

QUESTIONS.

[6272.]—**Coloured Drawings.**—What are the legal charges an architect can make for coloured design for building, without any specification, &c., presuming he does not the job? Is there any law or legal decision on this question?—Architect.

[6273.]—**Imitation of Hand-Painted or Stained Glass.**—Are there any transferable paintings made which would be suitable to transfer to a glass fan-light over front door and staircase windows, &c., and which would admit of being washed?—J. L. Cole.

[6274.]—**Surveyors' Charges.**—I have laid out a piece of ground (36 acres) in streets and terraces for building purposes. The plan has been lithographed for circulation. The ground was purchased for £25,000. Would any one inform me a fair charge to make for my labours?—Scotia.

[6275.]—**Guttering Altar-Candles.**—I have built a small R.C. chapel, and the officiating priest tells me that the candles lighted on the altar during Mass run and gutter as if a strong current of air was passing over them. At week-day services, when the congregation is small, this does not occur. The chapel is cruciform, about 50ft. from front to back of altar, by 18ft. in width, short transepts. Could any reader kindly give me a remedy?—Mediæval.

[6276.]—**Sewage Disposal.**—Having a gravel bed of 6 acres in extent, and averaging 6ft. in depth, and on the slope so that a number of flat filter-beds could be easily formed, how would this answer for sewage disposal? If suitable, the sewage of how many persons per acre should be calculated?—Sewage.

[6277.]—**Party-Walls.**—Has one of the joint owners of a party-wall the right to build same higher than required by the other, of course paying full cost of extra height, not merely when first building, but in case of any alterations he may wish to make? If one wishes to build higher than the other, how about cost of flashings, &c., caused by difference of height? In the case of building-land being sold off to different builders, awkward cases arise as to payment for party-walls, when they do not both require the same walls the same height, and I should be much obliged if some correspondent would give me some reliable information, not merely private opinions, on the laws relating to same, or could refer me to any authorities on the subject, which seems involved in confusion and doubt.—Party-Wall.

[6278.]—**Architect's Commission.**—I some time ago saw two very curious items in a schedule of quantities, and should like very much if any of your readers could inform me if such items are or are not included in an architect's commission of 5 per cent. The job is a large Mansion House, now being erected in the West of Scotland, and the schedules were issued by a known firm of surveyors in Edinburgh. At the end of the joiners' schedule occurred the following:—"Allow for second set of plans for contractor's use during progress of works, payable off first instalment, £600. Allow for expenses in connection with clerk of works department (correspondence and looking over reports I presume), £500." At the end of the mason work most probably the same occurs, and also sums in proportion at each of the other trades. Taking the schedules all over, say £4,000 is thus netted by the architect over and above his commission, and I should like to ask your readers if these charges are sanctioned by the R.I.B.A. scale (as the architect is a member of this body), and if not, what term can most appropriately be used to this wholesale way of making money?—Vanity Fair.

[6279.]—**Cubical Contents.**—What is the best and most accurate method of getting out the cubical content of earth in a manhole 11ft. deep, 3ft at the bottom, which is square, and tapering to 2ft. at the top? Also, what method is used for getting out the quantity of brickwork in same, the walls to be 9in. thick, at so much per square yard? Also, the quantity of bricks required. —P.

REPLIES.

[6263.]—**Doors.**—I take a 1½in. ledged door to be a door that should properly be specified as a 1½in. ledged 1in. door, which would be a door very generally used. A 1½in. door with 1½in. ledges I never saw used or heard of in 25 years' experience in the building trade.—J. H. M.

[6264.]—**Wall Ties.**—Chambers and Monnery's wrought-iron wall ties, placed 2ft. apart every way, will be amply strong enough for connecting a 4½ to a 9in. wall 30ft high. I have used them for a great many buildings, and find them a very good article. I have not used cast-iron ties.—L. Burton, Southampton.

[6264.]—**Wall Ties.**—Either wrought or cast-iron, if used 3ft. apart and 2ft. in height. As far as I know of them in using them, they have carried walls near upon 40ft. high, and I would use them double that height if the building had party-walls and joists to support it against rough winds. Say, rooms in clear 20ft. each way and two 4½in. walls with about 2½in. or 3in. cavity, well bed the ties each end, and avoid cutting the bricks over the ties, but make the ties quite firm with the first course on top of ties.—J. C.

[6266.]—**Weight Carried by Brick Pier.**—If the pier is perfectly true and plumb, it might sustain safely a weight of 16 tons; but as the height of pier exceeds its breadth so much, I should not like to place more than half that upon it. Care must be taken, however, that the weight carried is quite vertical, and truly built of good hard bricks.—G. H. G.

[6268.]—**Spotty Walls.**—The spottiness and damp which have so discomforted "Perplexed" are due to sea-sand in the plaster, which nothing but hacking off the spotty parts, or lining the wall with tinfoil or linoleum, will remedy. No amount of distempering will have the desired effect.—G. H. G.

[6269.]—**Sea-Sand in Mortar.**—As an old reader of the Building News, and an old customer of sea-sand, I have built about 30 or more lodging-houses within 40 yards to high water, and have used no other sand for masonry cementing. 2. Plastering, have used it the same hour as it came from the shore, and had no complaint of damp in any way. London architects specify it to be clean from salt, and the sand to be washed, but I have seen it to be unnecessary.—T. J. C.

[6269.]—**Sea-Sand in Mortar.**—Sea-sand is undoubtedly better and sharper than pit-sand, if the saline matter can be removed; but this is the difficulty, and in nearly all cases where I have known it used the evils recorded by "Perplexed" have been the result. It is, of course, possible to wash it all over in fresh water, and in this case nothing could be better for mortar or plastering stuff. There is no real objection to it other than the risk attending imperfect washing. Higgins and all authorities since his time forbid the use of sea-sand. Dr. Higgins, if I remember, excludes it from any other purpose than that of hydraulic work. The mortar made from it never hardens, and readily imbibes damp from the atmosphere. Road drift, if properly cleaned, is a good substitute for river or pit-sand.—G. H. G.

[6271.]—**Rights of Architects' Assistants.**—It is quite lawful for an architect's assistant to practise on his own account, though it is not customary to do so. If his private work does not interfere with the duty he owes to his employer, we cannot see any valid objection to his doing so. As a rule, however, employers, especially architects, are jealous of what they might consider to be an encroachment upon their privileges, and we think it rather objectionable for an architect's assistant to set up and practise within the locality of his employer. Many architects would certainly object to his doing so. There is, moreover, an etiquette in the matter which cannot be altogether set aside.—G. H. G.

STAINED GLASS.

Hungerford.—A three-light window has recently been placed in the parish-church, Hungerford. The subject represented is the "Sermon on the Mount," our Lord occupying the centre light, with figures of His disciples in the two side-lights. The upper and lower parts of the lights are filled with architectural canopies. The window has been designed and executed by Messrs. Heaton, Butler, and Bayne, of London.

STATUES, MEMORIALS, &c.

Memorial to the Late Prince Imperial.—The memorial to the late Prince Imperial is now nearly completed, and will shortly be erected on Chislehurst Common. The memorial, a Runic cross, which is made of gray granite, 27ft. high, rests on a solid granite base led up to by steps. In front is the inscription, and on the back an extract from the will of the Prince. The granite is from the quarries of Messrs. Shearer, Field, and Co., De Lank, Cornwall, who have executed the work from the design of Mr. G. W. Robson.

Salisbury.—A canopied tomb, with a recumbent figure of the late Bishop Hamilton, will shortly be erected on the south side of the altar in the cathedral. The design is by Sir Gilbert Scott, and the figure is the work of the Hon. and Rev. Bertram Pleydell-Bouverie.

Statues of Burns.—On the 16th inst. a colossal statue of the poet Burns was unveiled at Dundee, in presence of some 30,000 persons. The statue, which is in bronze, was executed by Sir John Steell, R.S.A., and represents the poet sitting on the stump of a tree. A replica of this statue has been set up in the Central Park, New York, and was unveiled on the 2nd inst.

WATER SUPPLY AND SANITARY MATTERS.

Bandon.—The board of guardians of the Bandon Union (Co. Cork, Ireland) have approved of the plans of proposed water-supply, prepared by Nat. Jackson, C.E. The reservoirs will contain about 5,000,000 gallons of water—42 days' supply, at 20 gallons per day for each head of the population. The estimated cost is £4,600.

Doncaster.—On Wednesday the new reservoirs which have been erected by the Doncaster Corporation at Thrybergh, about four miles from Rotherham, were opened. The water is brought to the Thrybergh reservoir by a conduit from the Conisborough brook, a distance of about a couple of miles. This reservoir occupies about 47 acres of land, and is capable of holding 254,000,000 gallons of water. Yesterday it contained about 210,000,000. The engineer of these works is Mr. P. S. Brundell, C.E., of Doncaster, and for about four years they were carried out under the superintendence of Mr. J. F. Tyler. About two years ago that gentleman received an appointment under the Wigan Corporation, and since then the works at Thrybergh have been superintended either by the engineer or his assistants. The cost of the works is, up to the present time, about £120,000, and about £60 000 has been expended as compensation. The contractor for the works was Mr. James Thane, of Maryport.

Limerick.—The corporation received, last week, a report from the city surveyor, Mr. W. E. Corbett, a report as to the better provision of water-supply to the city, for which schemes were recently invited, in competition, from civil engineers. Mr. Corbett, reviewing the several designs, recommended that the present water company's works be purchased, and that the supply be supplemented from the River Shannon. The intake pipe should be extended above the mouth of the tributary Groonin river, and new pumping-works and reservoir should be formed at Newcastle-hill, with a 12in. supply-main from thence to the city. His estimate of cost was £45,000 for new works, and £19,500 capitalisation of extra annual outlay. It was resolved to send the report and scheme to the Local Government Board.

CHIPS.

The bridge over the river Hindburn, in South Lonsdale hundred, has been rebuilt for the county magistrates of Lancashire. Mr. Cumberland, of Bentham, was the contractor; and the work was done from plans by, and under the supervision of, Mr. E. G. Paley, the county bridgemaster.

Extensive additions to the parish-church of North Ormesby, Middlesbro', have recently been made, consisting of new south aisle, south transept, and the lengthening of the whole building westward. The architect was Mr. C. Noel Armfield, of the firm of Armfield and Bottomley, Whitby and Middlesbro', and the works have been carried out by Messrs. Allison, Brothers, Middlesbro'.

The Hove Commissioners last week decided to allow their surveyor, Mr. E. B. Ellice-Clark, £100, as remuneration for extra work in preparing plans and designs for the chapels, lodge, walls, and other works in connection with the new cemetery.

A new reading-room and cocoa-tavern is about to be erected at Ingleton, from the plans of Mr. John Hewitson, of Lancaster.

Messrs. Protheroe and Morris are going to sell on Wednesday next, at Woking station, a quantity of nursery stock which seems worth attention from planters and others. The ground is afterwards to be offered for building purposes.

A memorial reredos has just been placed in Evershot parish-church, Dorset. It is the work of Mr. J. C. Kempe, of London, and is of dark oak, divided into five panels, of which the centre one contains a brass cross, and the others, shields of brass, bearing each an emblem of one of the Evangelists. Outside these panels are rich red velvet hangings and oak panelling, picked out with gilding. A new altar-cloth of olive-green silk, embroidered in gold and silks, has been worked and placed in the church by the donor of the reredos, Mrs. W. Wyndham Baring.

Two memorial-stones of a new Wesleyan Methodist school and school chapel, to be built in Crookesmore-road, Sheffield, were laid on Monday. The building will be of the Perpendicular style of architecture, built of Oughtibridge wall stone, with dressings of ashlar stone from Grenoside. The land and the schools will together cost £2,000. Mr. J. D. Webster is the architect.

The first stone of a memorial, to be erected in Wisbech, in honour of Thomas Clarkson, the advocate of negro emancipation, was laid on Monday. This earnest opponent of slavery was born in that town in 1760. The memorial will chiefly consist of a statue, designed by the late Sir Gilbert Scott, R.A.

A new Congregational church, to accommodate 500, is about to be commenced at Heaton, a suburb of Newcastle-on-Tyne. The church will, when completed, consist of a nave with double transepts, and there will be a small west-end gallery. At the east end will be a schoolroom and classroom vestry, with other conveniences. The materials to be used are stone, with ashlar dressings and slated roof. Eventually, the erection of a tower and spire is contemplated. Messrs. Oliver and Leeson, of Newcastle, are the architects.

The Glasgow City Improvement Trust last week adopted a recommendation of a committee based on a report and plans by Mr. Carrick, C.E., the city engineer, to erect on an area now being cleared in the Salt-market, shops, having over them houses built as workmen's tenements of one and two rooms and kitchen "that would be a credit to the city and a model to builders." It was stated that the rentals would yield a fair return on the outlay. The trustees also considered four alternative plans prepared by Mr. Carrick for laying out the ground belonging to the Trust at Townhead, and adopted No. 2, by which the land will be laid out in 60ft. wide streets, with spaces between the backs of tenements of from 110 to 140ft., and let out to builders. The return is estimated at £71,361, and the probable number of persons housed 2,610.

Plans for a lodge at the new cemetery were submitted to the Horsham burial board by their architect, Mr. R. Aldridge, on Monday, and were adopted.

Our Office Table.

Messrs. Robert Boyle and Son having recently applied their patent self-acting air-pump ventilators to the chapel of Caius College, Cambridge, under the direction of Mr. Alfred Waterhouse, some experiments were made to test their efficiency, and though subjected to very trying conditions, they were found to be acting in a most efficient manner, the air being extracted through each ventilator at the rate of about 700 cubic feet per minute, whilst there was not the slightest down-draught experienced during the whole time the experiments lasted. Those present expressed themselves thoroughly satisfied with the result of the experiments, and also with the marked purity of the atmosphere of the chapel, and the entire absence of currents. These ventilators are to be extensively adopted at another college in Cambridge, to the Guildhall of which town they have also lately been applied.

The First Ordinary Meeting of the Session 1880-81 of the Royal Institute of British Architects will be held on Monday evening next, when the opening address of the session will be delivered by Mr. John Whichcord, F.S.A., president. A special general meeting of members only will be held at the close of the ordinary meeting (probably at 9.30 p.m.), to elect an honorary secretary in place of Mr. Thomas Henry Wyatt, deceased the 3rd of August, 1880. A memorial, signed by 335 members of the Institute of British Architects, and 1,000 non-members, is about to be presented to the President and Council on the question of the present state of public architectural competitions. The memorialists say that, in the interests of the whole profession, it is desirable that the Council should devise a remedy which, while insuring greater advantages to the public, will at the same time place the competition system on a more satisfactory basis. The memorialists further state that the necessities of the case call for united action on the part of the profession, and that the most effectual way of insuring this will be to devise some scheme whereby all members of the profession can agree not to take part in any public competition unless a professional adjudicator of established reputation is appointed. To such a condition, if generally accepted, the memorialists are prepared to bind themselves.

The Glasgow branch of the Sunday Society was inaugurated on Monday, when an address was delivered by Professor Tyndall. Professor Tyndall said that in all times what was called the objective character of religion had never been changed. There were many instances of this, but the difference which most concerned them was as to the binding power of the Jewish law in reference to the dissensions which broke out among the Apostles themselves. Nobody who read with attention the Epistles of Paul could fail to discern that the mighty propagandist had to carry on a life-long struggle in order to maintain his authority. As a minister of Christ he fought for freedom—a freedom which it might be said they were still contending for. Nobody more than he would fight against the making of the Sabbath-day into a common working-day. The following motion was agreed to:—"That this meeting heartily approves the action of the Sunday Society, and trusts that both Houses of Parliament will next session adopt the following resolution, viz., 'That, inasmuch as all opposition to the action of Her Majesty's Government in opening on Sundays the national museums and galleries in the suburban districts of London and in Dublin has entirely ceased, owing to the good results which have followed such opening, this House is now of opinion that the time has now arrived for extending this action to all national institutions of a like character.' "

The people in the City who are answerable for the present position of the Temple Bar Memorial seem determined, if possible, to show that the outcry against it as an obstruction to the traffic was a most legitimate one. They are now making more room on the north side of the structure for vehicular traffic by narrowing the pavement originally given for the benefit of foot-traffic in front of the New Law Courts. Not content with this, it is said, they were also proceeding to do the same on the south side, when they received a reminder from Messrs. Child and Co. that the pavement they were so quickly appropriating had been given by the bank when the new premises were erected, on the express understanding that it was to remain a footway. On Wednesday the City Lands Committee of the City Corporation waited upon the Strand District Board of Works, for the purpose of appealing to that body to reconsider the resolution they had come to opposing the erection of the Temple Bar Memorial, and withholding their sanction to the construction of a rest for pedestrians on the west side of the memorial. One of the deputation pleaded that if the Strand Board continued to refuse their sanction there would be but one rest, and the memorial would look "like a pig with one ear." A member of the Strand Board moved that the sanction of the Board be given to the application. The chairman, however, ruled this out of order. The first thing to be done, he pointed out, would be to rescind the resolution already passed, and that could be done only by notice of motion. The matter, therefore, was ordered to stand over until next week.

A meeting of the Association of Municipal and Sanitary Engineers and Surveyors will be held at Salford, on Friday next. The members will assemble at 11 a.m. at the "Swan" Inn, near to Weaste station, on the Manchester and Liverpool Railway. Those who require further information are desired to address their communications to Mr. R. Vawser, M.Inst.C.E., District Honorary Secretary, 2, Cooper-street, Manchester. The members will first proceed to Mode Wheel, where Mr. Arthur Jacob, M.Inst.C.E., borough engineer of Salford, will show them the concrete sewage tanks now in course of construction, and describe the system of intercepting sewers adopted and carried out at Salford. If time permits, members may likewise visit the iron bridge in course of construction over the river Irwell, and the health committee's depôt at Holt Town, Manchester, where the night-soil of the town is converted into a native guano.

The first meeting of the 127th session of the Society of Arts is announced for the 17th November, when the opening address will be delivered by F. J. Bramwell, F.R.S., chairman of the council. Before Christmas there will be four ordinary meetings, in addition to the opening meeting, at which the following papers will be read:—November 24th—"Barry's Influence on English Art," by J. Comyns Carr. December 1st—"The Photophone," by W. H. Preece. December 8th—"London Fogs," by Dr. A. Carpenter. December 15—"The Use of Sound for Signals," by E. Price Edwards. Among the papers down on the list for reading after Christmas are:—"The Present Condition of the Art of Wood-carving in England," by J. Hungerford Pollen, and "The Discrimination and Artistic Use of Precious Stones," by Prof. A. H. Church. Five courses of lectures are announced under the Cantor bequest:—First course—Five lectures on "Some Points of Contact between the Scientific and Artistic Aspects of Pottery and Porcelain," by Prof. A. C. Church. Second course—Three lectures on "Watchmaking," by Edward Rigg, M.A. Third course—Four lectures on "The Scientific Principles involved in Electric Lighting," by Prof. W. G. Adams, F.R.S. Fourth course—Three lectures on "The Art of Lace-making," by Alan S. Colc. Fifth course—Three lectures on "Colour-Blindness and its Influence upon Various Industries," by R. Brudenell Carter.

A Meeting of the Fog and Smoke Committee appointed by the National Health and Kyrle Societies was held on Wednesday week at the society's rooms, 44, Berners-street, Mr. Ernest Hart in the chair. Several schemes for the introduction of smokeless fuel were considered, and it was decided to appoint a sub-committee of experts to examine and report on the different inventions for the prevention of smoke, such sub-committee to consist of Dr. Siemens, Professor Chandler Roberts, Captain Galton, Mr. Hoole, Mr. Statham, and Mr. Eassie; also that steps should be taken for holding in London an exhibition of smoke-prevention apparatus. A second meeting was held on Wednesday last, when the Chairman stated that further communications had been received containing suggestions for the prevention of smoke, and these communications were ordered to be referred to the Sub-Committee of Experts. The Chairman observed that communications were in progress with a view to an exhibition being organised of smoke-prevention apparatus; and Mr. E. Chadwick having assured the Committee that in this matter the Society of Arts would afford any help it could, expressed the opinion that it might also be well to have an exhibition which would show the relative warming power of different gas-stoves. The chairman suggested that a communication should be addressed to Sir Edmund Henderson asking him whether he could favour the Committee with any details as to the organisation by which the Act was attempted to be put into operation in the metropolis, and as to whose duty it was to superintend and carry out its provisions; and whether, in his opinion, it would not be desirable to create for London a separate organisation, attached either to the Home Office or the Local Government Board, for the purpose of putting the statute more generally in force. This suggestion was adopted; and the meeting adjourned for a week.

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker, 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Pills.—Typhoid and other Fevers may be arrested in their early stages by a course of these purifying Pills. This medicine controls the circulation, lessens the shivering, and modifies the hot periods. Holloway's Pills relax the parched skin, diminish the excessive thirst, clear the furred tongue, and restore to health.

CHIPS.

Kingston Bagprize church has been reseated and otherwise renovated. All the seats are of English oak; those in the chancel have carved ends. New floors have been laid, and a new altar and font have been fixed. The warming is by one of Messrs. Musgrave's patent slow-combustion stoves with warm and cold air flues, specially arranged from the architect's design. The works have been executed by Mr. John Wheeler, of Wantage, from the designs of Mr. Edwin Dolby, of Abingdon.

The workmen of Messrs. D. C. Jones and Co., builders, of Gloucester, now employed upon the new municipal buildings at Hastings, in course of erection from the plans of Mr. Andrews, borough surveyor, had a tea and meeting on Friday evening. In the course of the proceedings a carriage-clock and gold chain and locket were presented, on behalf of the workmen, to Mr. James Heavens, foreman of works.

The Workmen's Hall in West Ham-lane, Stratford, E., is in course of enlargement. The tender of Mr. Hosking has been accepted for the execution of the contract.

New infant-schools erected in connection with the Roman Catholic church of St. Francis Xavier, Liverpool, were solemnly blessed on Monday week. Accommodation has been provided for 500 children at a cost of £2,000. The work of erection has been carried out by Messrs. Holme and Nicol, Liverpool, from plans prepared by one of the Fathers of the Society.

Mr. Robert Hutchisou, of Hillwood, was on Friday elected dean of guild for Edinburgh by 102 votes to 91 given for Mr. William McGregor, builder, of that city.

A new line of railway, connecting Ballycastle on the coast of Antrim, with the Northern Counties of Ireland Railway at Ballymoney, was opened on Monday.

The New Inn premises, Eastbourne, were opened, after enlargement and rebuilding, with a house-warming dinner, last week, at which were present the architect, Mr. C. W. Tomes, and the builder, Mr. Reuben Climpsou, both of Eastbourne.

The harbour trustees of Cardiff made an agreement on Monday with Mr. T. A. Walker, the contractor for the new east dock, to complete the work by Oct. 20, 1881, nine months earlier than the time fixed by the original contract, in consideration of the payment by the trustees of an additional £9,000.

A new station is in course of erection at Polegate junction, consequent on the opening of the new direct line to Eastbourne. Mr. Anscombe is the contractor.

At the Court of Common Council for the City of London it was reported that thirty sculptors were in communication with the Bridge House Estates committee as to the competition for the statuary to be placed on Blackfriars-bridge.

The workhouse schools at Caerleon are about to be enlarged, for the guardians of Newport Union, at a cost of £6,000. Mr. Watkins is the architect, and on Saturday the guardians appointed Mr. Thos. Jenkins, of Caerleon, as clerk of works.

CHIPS.

At the London Bankruptcy Court yesterday an application was made for the appointment of a receiver and manager of the estate of George Stevens, who has petitioned the Court for the liquidation of his affairs, describing himself as of St. Mark's-road and Oxford-gardens, Notting-hill, builder, lately carrying on business in partnership with George Colls, under the style of Stephens and Colls. The debts secured and unsecured are stated at £50,000. The assets are expected to realise a considerable surplus. His Honour appointed Mr. F. B. Smart, accountant, receiver and manager of the estate.

The Lambeth Board of Guardians received, on Friday, a report from the solicitor as to the long-pending arbitration between the guardians and Mr. James Taylor, the contractor for the new infirmary. Mr. Taylor claims £6,000, and the guardians have offered him £1,000 in settlement. The arbitration has been suspended, owing to the continued illness of the arbitrator, Mr. Stephenson, and already the guardians have incurred £550 costs, in addition to the architect's claim and arbitrator's fees. The solicitors for Mr. Taylor now offer to accept £3,000 in settlement of all claims. The Board resolved, after discussion, to offer £2,000 in settlement.

At Fakenham, on Friday last, the first sod was cut of the Norwich Extension of the Lynn and Fakenham Railway. The new line will be 30 miles in length, the contractors being Messrs. Wilkinson and Jarvis, who have undertaken to complete it by August, 1882.

The parish-church of Reigate is in course of restoration, from the plans, and under the supervision, of Mr. E. Larmer, architect, the contractor being Mr. Bagley.

Mr. Alexander Speed Livingstone, civil engineer, died from heart disease on Tuesday week, whilst engaged in a game of chess, at his own house in Sydenham. He was 68 years of age.

The Leicester Town Council, at a special meeting held on Tuesday, adopted a scheme for the prevention of floods in the borough, estimated to cost at least £80,000. It involves deepening and widening the upper Soar river, the formation of a new canal, and the reclamation of much corporation land. The scheme has been prepared by Mr. Griffiths, borough engineer, and approved by Mr. Hawsley, hydraulic engineer. The town council are now expending about £50,000 on improvements to the lower Soar river.

The rebuilding of Deptford-bridge has been commenced by the contractors, Messrs. Gammon and Co. The work of rebuilding and enlargement is being done for the Metropolitan Board of Works.

The east window in the south aisle of Pensford Church is being filled with stained glass as a memorial. It is of two lights, the subjects being "Christ as the Good Shepherd" and "Our Lord healing the Blind Man." The work has been executed by Messrs. Joseph Bell and Son, of College-green, Bristol.

A new organ placed in St. Andrew's Hall, Norwich, by public subscription, and presented to the city, was opened on Friday night. It has been built by Messrs. Bryceson Bros. and Ellis, of Charlton Works, Islington. The old oak case has been enlarged and adapted from the designs of Mr. Edward Boardman, architect, of Norwich.

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Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co, Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your Glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Royal Institute of British Architects. Inaugural address by the President, Mr. J. Whichcord. 8 p.m.
Society of Engineers. "Engineering Notes on Cyprus." By C. J. Alford. 7.30 p.m.
London and Middlesex Archæological Society.
Thursday.—St. Paul's Ecclesiological Society. Paper on "Old St. Paul's." By the Rev. E. C. MacKenzie Walcott, B.D., F.S.A.
Friday.—Architectural Association. Presidential address by Ernest C. Lee. 7.30 p.m.

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Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

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CHARLES TRASK,
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McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[Advt.]

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BOX GROUND STONE
Is the Best for Use in all Exposed Positions, being Well-known and Tried Weather Stone.
50,000 Feet Cube in Stock.
PICTOR & SONS,
BOX, WILTS.
[Advt.]

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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Bedfordshire.—For erecting a bridge between Flitwick and Maulden, for the Woburn District Highway Board. Mr. Adkines, surveyor:—

Randall (accepted)	£44	5	0

Bethnal Green.—For alterations at the "Prince Albert," Mape-street, for Mr. R. Hillier. Mr. Edward Brown, architect, 5, Church-street, Spitalfields:—

Salt	£1,145	0	0
Marr	1,113	0	0
Skipper (accepted)	1,015	0	0
Gasfitter's work:—			
Stedman (accepted)	125	0	0

Brentford.—For erection of granary, &c., High-street, Brentford, for Messrs. Jupp and Sons. Messrs. Smithies and Gladman, architects:—

Adamson and Sons	£995	0	0
Nye	995	0	0
Beauchamp	975	0	0
Brunsden	900	0	0

Brentford.—For alterations and additions to bar of "Plough Inn," High-street, Brentford (exclusive of fittings), for Montague Ballard, Esq. Messrs. Smithies and Gladman, architects:—

Beauchamp (accepted)	£160	0	0

Brownhills.—For the erection of new offices, for the local board of Brownhills, near Wolverhampton:—

Lowe and Flint, Dudley (accepted)	£2,462	10	0

Falmouth.—For the erection of a new organ in the parish-church of Falmouth:—

Hele and Co., Plymouth (accepted)	£700	0	0

[Seven tenders were received.]

Hackney Wick.—For the erection of new schools at Sidney-road, Hackney Wick, for the School Board for London. Mr. E. R. Robson, architect. Quantities supplied by Mr. T. Thornton Green:—

Staines and Son	£18,273	0	0
Wood, Bros	17,912	0	0
Booth and Sons	16,414	0	0
Brass	16,257	0	0
Higgs and Hill	15,998	0	0
Braid and Co.	15,994	0	0
Hook and Oldrey	15,519	0	0
Kirk and Randall	14,940	0	0
Nightingale	14,882	0	0
Pritchard	14,726	0	0
Grover	14,483	0	0
Cox	14,460	0	0
Boyce	14,460	0	0

Ilfracombe.—For iron framing to roof of swimming-bath, for the Ilfracombe Hotel Co. (Limited). Mr. W. M. Robbins, architect:—

Maclellan, P. and W., Glasgow	£371	6	0
Gardner, J. O. and Co., London	297	0	0
Isca Foundry Co., Newport, Mon.	295	0	0
King, J., Ilfracombe	275	0	0
Avery, J., Ilfracombe (accepted)	248	0	0
Kerslake, J., Exeter	242	0	0
For joiner's work to said roof:—			
Kibby, Gloucester (accepted)	£250	0	0

Ilfracombe.—For pair of villas, Fortescue-place, for Mr. G. E. Russell. Mr. W. M. Robbins, architect:—
Collins, R., Ilfracombe (accepted).

Inverness-shire.—For reconstructing the Findhorn bridge, for the road trustees of Inverness county. Mr. Wm. Paterson, C.E., Edinburgh, engineer:—
Oliver & Arroll, Leith-walk, Edinburgh (accepted) £1,507.

Camberwell, S.E.—For the erection of 7 shops in Albany-road, 5 stables in Albany Mews, and building 5 shops on fore courts on Camberwell-road, for Mr. A. Stedall. Mr. George Edwards, architect. Quantities supplied by Mr. Henry Lovegrove:—

				Allow for old Materials.		
Ashby, Bros.	£11,193	0	0	£80	0	0
Woodward	10,757	0	0	15	0	0
Colls and Sons	10,750	0	0	100	0	0
Nightingale	9,783	0	0	200	0	0
Downs and Co.	9,655	0	0	56	0	0
Mortar	9 608	0	0	125	0	0
Hobson	9,573	0	0	30	0	0
Scrivener and Co.	9,372	0	0	50	0	0
Lidstone and Son	9,365	0	0	50	0	0
Thompson	9,333	0	0	80	0	0
Terrant and Sons	9,180	0	0	100	0	0
Stimpson and Co.	8,877	0	0	90	0	0
Goad	8,790	0	0	50	0	0
Cullum	8,599	0	0	60	0	0
Martin, Wells, and Co.	8,430	2	0	81	0	0
Green (accepted)	7,946	0	0	186	0	0

Poplar, E.—For the paving and making-up of streets, for the Poplar district board of works:—

Bishopsgate-road:—			
Knight, L. (accepted)	£205	0	0
Ireton-street:—			
Rutty (accepted)	205	0	0
Norris-road:—			
Rutty (accepted)	110	0	0

Ramsgate.—For Smack Boys' Home, Royal Harbour, Ramsgate. Mr. Alfred R. Pite, architect, 44, Bloomsbury-square, W.C. Quantities by Mr. Joseph Rookwood:—

Newby	£2,777	0	0
Paramor	2,320	0	0
Mitchell	2,300	0	0
Hooper	2,280	0	0
Evans	2,165	0	0
Nichols	2,139	0	0
Shrubsole	1,948	0	0
Denne	1,940	0	0
Martin	1,880	0	0

Soho.—For alterations to the "Hampshire Hog," Berwick-street, for Mr. Stanton Mr. Edward Brown, architect, 5, Church-street, Spitalfields:—

Gritton	£855	0	0
Marr	777	5	0
Wood	692	0	0
Jenkins, Reading (accepted)	482	0	0
Pewterers:—			
Davis	96	0	0
Phillips	86	6	0
Rogers, J. (accepted)	74	15	0
Gasfitters:—			
Winn	£155	0	0
Christian	97	0	0
Stedman (accepted)	78	0	0

Southampton.—For new shop and dwelling-house, St. Mary's-street. Mr. Arthur Martin, architect. Quantities by the architect:—

Sanders	£525	0	0
Laver	459	0	0
Rowland (accepted)	420	0	0

Southwark.—For alterations of Nos. 21 and 23, Newington Causeway. Mr. George Edwards, architect:—

Martin, Wells, and Co.	£419	0	0
Laidler	435	0	0
Richardson	350	0	0
Stimpson and Co. (accepted)	321	0	0

Southwark.—For the erection of a warehouse in St. Thomas's-street, Borough, S.E., for Messrs. G. R. Herron and Son. Mr. William Wimble, architect:—

Falkner	£6,835	0	0
Brass	6,463	0	0
Scrivener	6,345	0	0
Lawrance	6,181	0	0
Ashby and Horner	6,172	0	0
Croaker	6,042	0	0
Morter	5,943	0	0

Spitalfields.—For pulling down and rebuilding No. 1, Green-street, for Mr. Edward Tilney. Mr. Edward Brown, architect:—

Hawkins	£375	0	0
Skipper	333	0	0
Belcher and Ullmer (accepted)	284	0	0

Steeple Claydon.—For new villa residence and stabling, &c., at Steeple Claydon, Bucks, for Mr. John Gross. Mr. F. H. Barfield, architect:—

Franklin, Deddington	£1,188	0	0
Marshall and Boyer, Buckingham	1,028	0	0
Cooper, Aylesbury (accepted)	806	10	0

St. Leonard's.—For reinstating "Fairlawn," St. Leonard's-on-Sea, after fire, for W. W. Berkley, Esq. Messrs. Fowler and Hill, architects. Quantities by Messrs. Fowler and Hugman:—

White, St. Leonard's	£1 443	15	8
Rodda, St. Leonard's	1,400	0	0
Cruttenden, F., St. Leonard's	1,290	0	0
Eldridge and Cruttenden, St. Leonard's (accepted)	1,130	0	0

St. Marychurch, Torquay.—For new guest-house and completion of the cloister of St. Mary's Priory, for the Nuns of the Third Order of St. Dominic. Messrs. Josh. A. Hansom and Son, 27, Alfred-place West, South Kensington, architects:—

Eddles, W. and J. (accepted)	£1,714	5	6

[First section, £503 5s.; second section, £590 10s.; third section, £620 10s. 6d. Total, £1,714 5s. 6d.]

Wandsworth, S.W. For works of kerbing and channelling in Northcote-road, for the Wandsworth District Board of Works:—

Cooke and Co. (accepted)	£960	0	0

[Lowest tender received.]

Westminster.—For offices and residential chambers, Westminster, for Messrs. R. C. and J. B. Nichols. Mr. W. L. Baker, architect. Quantities supplied by Mr. T. Nixon:—

Hatton and Co.	£17,900	0	0
Foxley	17,900	0	0
Ashby, Bros.	16,940	0	0
Higgs and Hill	16,690	0	0
Condor	16,100	0	0
Chappell	15,886	0	0
Macey and Sons	15,799	0	0
Morter	15,743	0	0
McManus	15,700	0	0
Fish	15,520	0	0
Kirk and Randall	15,240	0	0

Erratum.—In the list of tenders published last week for Cotesbach House, Leicestershire, Mr. H. H. Herbert's tender was incorrectly printed £720, instead of £739. Messrs. Tomlinson and Cowdell are the architects.

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BEST BATH STONE.
Westwood Ground, Box Ground, Combe Down, Corsham Down, and Farleigh Down.
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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 5, 1880.

THE OPENING ADDRESS AT THE INSTITUTE.

If there was nothing very fresh, the address, delivered on Monday night was certainly more practical in tone than others which have been given by some of Mr. Whichcord's predecessors. The question of the architect's education is a very old one, and nothing which Mr. Whichcord said has not been said years ago; indeed, it seems to us that it is only the impetus given to education in connection with other professions that has urged the Institute to any effort in this direction. What the President said with respect to the architect's usual acquirements was perfectly true; the architect has in too many cases become a decorator rather than a constructor, and the quotation from Rondelet to that effect shows that even in his day there was a strong presumption that the architect was not exactly all he should be. But why has not the Institute been able to do any thing to remove the reproach levelled against architects? This is the point about which the President's address leaves us in the dark.

Mr. Whichcord's protest seemed, certainly, to suggest that the Institute was powerless to effect the reform it has now at heart. Why has it not done more? As a writer in the *Times* justly observes, speaking from an outside point of view: "The public will scarcely be of opinion that the Institute is at all extreme in its demands; rather, it will be the surprise of many that the elements pointed out by the President are in any need of being restated." We are very much of opinion that the Institute is not at present in a position to demand compulsory education; its members have not yet succeeded in obtaining the confidence of the profession in the British Isles; for, even on the showing of the President himself, the large majority of architects do not belong to the Institute at all.

It is extremely galling for a president of an institute of architects to have to tell unpleasant truths; but Mr. Whichcord very plainly hinted that architects were not what they ought to be: they were decorators; they did not take sufficient trouble to acquire a knowledge of building materials, and he might have added, sanitary construction; and were, in short, devoted too much to the attempt to make things pretty. In France large works, the laying-out of cities and thoroughfares, are legitimately regarded as the work of the architect; but in this country he is contented to design carpets, cabinets, coal-scuttles, and "cosy corners."

The President's remarks seem to support the idea that architects busy themselves more with art than they ought to do. He drew rather a sharp line of distinction between the requirements of utility and the demand for art, as if the one was incompatible with the other. This is a common view prevalent in the works of those writers who, like Rondelet, could not regard them as being both essential; it is the view also of a great many of the older school, whose education was restricted to the more useful branches of an architect's business. But it is not a view that will take now. It is well contended that it is the business of the architect to produce buildings with architectural effect; if he cannot do this he ought to be content to call himself a builder only. Education can no more unmake an artist than itcan make him; and, therefore, it is not wise to make such a great deal of what should, after all, be only the A B C of architectural knowledge. No one doubts the value of a knowledge of both geometrical and freehand drawing, and of the elements of building materials, but both are within the capacity of anyone who will only give himself to their attainment. Use and beauty have also, by the very training of the student, been kept so far apart and so distinct, that it is almost thought to require an effort to keep them in due relation. To promote their union it is not wise to utter a protest against what is thought to be a cry for more art, but to endeavour to reconcile them both. There is a certain amount of sentiment which passes for art-exaltation, and the phrase "high art" is one that has been coined of late years to express the tendency to transcend the commoner uses and qualities of artistic objects. Some architects have caught the phrase, and have widened the breach between utility and art, and it is possibly this class to which Mr. Whichcord was referring. Young enthusiasts in the art will probably be led to regard the Institute's compulsory examination with disfavour, and it is this feeling the Institute will be wise not to promote indirectly.

Mr. Whichcord seemed surprised to find that less than a fourth of the practising architects in the United Kingdom belong to the Institute. It is certainly astonishing to hear such an admission from the President; and has he only just discovered that there are 3,000 persons engaged in some form of architecture, and only about 700 enrolled as members? On reference to Kelly's "Directory" he might long ago have found that such a state of things is not new. When he asks, For what reason do these practitioners stand aloof? he touches a more important question, which the Institute Council will do well to ponder. Has it ever been truly a representative body? Is it not only lately that it has thrown off its exclusive policy, and assumed a less autocratic manner? The records will answer the question. Times have changed, and the Institute, after adopting a more conciliatory tone, wonders how it is so large a number of the profession remain independent of it. Can any one wonder that the majority outside that "charmed circle" are not as yet impressed with the conclusion that the interests of the public and the honour of the profession are linked with the control and influence of the Institute of British Architects? One evidence of increased liberality certainly was the proposal that the library should be open free to *bonâ fide* students of architecture under twenty-three years of age, though, why the age is so limited is not very apparent. The list of students of the Academy and the Association who avail themselves of the facilities offered during the last year or two is not so long that the Council need fear an overwhelming influx of readers, as a consequence of setting the library door a little wider ajar.

One announcement that will be received with satisfaction in the reforms contemplated, is that the number of papers will be diminished, and their quality improved; let us hope that they will be reduced in length, as well as in number. Not less gratifying is the proposal to shorten what we have ventured to call the "parochial business" of the meetings, which has, hitherto, occupied an important part of the time with prolix details of no interest to the profession. Cannot the discussions be limited also; or, at any rate, lengthy paraphrases of the address on paper, such as were heard on Monday evening, be avoided?

A remarkable statement was made by the President as to the charges of architects. The by-laws have generally operated to exclude those who value their services at less than the customary charge of 5 per cent., notwithstanding the obvious anomaly of enforcing a uniform tariff upon both the young and inexperienced, as well as old, practitioner. We quite agree that such uniformity in the charge is both illogical and unfair, and the Institute, through its President, has now announced that no man who signs the declaration of a Fellow or Associate "incurs the obligation to abide by any restraints of professional charges." If this be so, one great barrier against admission into the Institute has been removed. It is a concession which appears only reasonable in the face of irregularities committed by those who avowedly owe allegiance to the charter and by-laws of the Institute. This, and kindred questions relating to competitions and quantities, have been referred to the conference to be held in May next. We trust they may receive the consideration they deserve, and that, as a result, the Institution may widen its own basis, and increase the dignity and prosperity of the whole profession.

THE INSTITUTE OF ART.

This exhibition of ladies' art work continues to improve in quality. In the class of needlework, the present collection shows, if anything, a higher appreciation of the principles of good design and colour; competitors have begun to estimate their capabilities in the contest, and a better class of work is the result. Looking at random over the collection, we notice that a prize has been awarded to a beautifully-worked pair of fire-curtains with peacock plumage, conventionalised, on rich cream-coloured satin sheeting. The border is particularly handsome and quiet in design. The curtains exhibited by another lady, Mrs. J. Park Sweetland, a dark green woollen fabric embroidered with flowers of red and white datura, taken from nature, and the same lady's curtains with sunflowers and stove-plants, are bold, and the colours striking. Miss B. Pigott's fire-curtains, with sunflowers worked upon a claret-coloured material, and her mantel-border with the same design, are handsome and effective as designs, and this sort of decoration appears likely to become very general, chiefly because it can be applied to mantel-pieces of the ordinary kind. Miss Barker sends a mantel-border worked with white flowers on a dark brown satin cloth, and we see other specimens of decorative needlework, evincing a taste for harmonious and subdued celouring. A table-cover, worked with a border in which hawkesweed has been introduced, is pleasing. Miss Burnand Hankey, who receives "honourable mention," exhibits a washing tea-cloth embroidered with silk, and having a panel-shaped insertion of good design; and the same distinction has been given to Miss Edith Scrivener for table-covers. We notice also some richly worked bed-hangings by Mrs. Gordon, with crewel-work border, treated in a naturalesque manner upon an oatmeal cloth.

Screens form an important section of artistic needlework in these exhibitions, and we find in the present gallery several designed on true principles of decoration. A small screen, with conventional ornament on a dark green woollen serge or twill, drew our attention. The painted screen by Mrs. Horace St. Paul is too coarse an imitation of nature to please us as a decoration, though, as a painting, the sunflowers and hollyhocks are vigorously executed. The silk embroidered screen, by M. E. Benham, is cleverly worked and in good taste; but we have no space to distinguish other examples of decorative needlework, nor can we do more than mention that a large portion of the tables are covered with a variety of ladies' work of a more useful kind, such as children's garments and household articles. Miss B. Pigott is a contributor to this class.

In designs for needlework, we may mention some spirited and boldly-painted cartoons, intended for screens, by Mrs. Earnshaw. The subjects represented are chiefly animal and vegetable life; the design with birds and rushes, intended for washstand back, and the curtain and dado designs, are appropriate and possess character. Lace-work is one of the special classes encouraged by the Institute. We do not notice any prize design this year, though many of the specimens of Italian, Honiton, and point-lace are extremely rich in design.

Painted china has received attention. There is a large display of plates and other china, decorated with floral designs. The dish, with lily, by Mrs. Talbot Coke, is a bold and vigorous design; the colours are quiet. We must award a word of praise also to her elegant set of painted jug and glasses in clear glass. The pair of vases, with tiger-lily on black ground, by another lady, are also tasteful. Red terra-cotta plates, &c., painted with various devices and folial ornament, are numerous. As specimens of decorative china-painting, we must particularly call the visitor's attention to the specimens on the screen. The panel representing "Narcissus," with birds and apple-blossom, is pretty and refined in drawing and colour, upon a light blue ground. The original designs of panels showing children in sportive attitude, by Miss Ida Welch, are decorative in tone, and the outlines fairly drawn.

Woodwork, inlaid, painted, and carved, is another section of the exhibits. Among the more striking articles we notice several inlaid tables, executed, in a very skilful manner, by an amateur artist, Mr. R. Arkwright. The small square and round tables, with inlays of ebony, walnut, and satinwood, are remarkable for pleasing design and colour: some of these are copies of old tables. They have turned ebonised legs. The painted cabinets and corner cupboard, by Mrs. Elcho Spon, are noteworthy as specimens of painted pinewood. Fretwork, and various fancy articles are too numerous to mention; but we may draw attention to some clever panels of flowers on gilt leather, the work of Miss Forster. Leather-work imitation is not surpassed by an exhibitor who this year contributes a dead dove, a group of fruit copied from nature. As imitational work, nothing can be closer, yet we can hardly call it legitimate decoration. The photograph frames on the table are pretty, but scarcely what we think suitable to enclose photographic pictures.

In the gallery devoted to oil and water-colour painting, we met with many masterly performances. Miss Hortense Wood still contributes a few of her quiet scenes, such as the "Moonlit Sea," and also another entitled "Tranquillity," which we have seen before. Mr. O. D. Scullard sends also one or two marine pieces, remarkable for the brilliance of atmospheric effect, and the impasto treatment. Miss H. Power's picture of a Skye terrier, to which a prize has been given, is a truthful and forcible rendering of nature; the handling is bold. Honourable mention has been bestowed on a picture of a fisherman reading a newspaper, by F. Morrish, a clever study of character, and Miss Hortense Wood's "Sunset" deservedly obtains a similar mark of distinction; it shows a setting sun behind a swamp, and is painted with much force and glow of colour. Miss Scammell also wins "honourable mention" for a pleasing study of a girl's face. We have seen "Waiting for a Dance" once before—a lady attired in a low silk dress of Georgian age, painted with considerable effect in water-colour. A clever oil sketch by John Beale, of Venezia, is on the screen, and the sunflowers painted by E. E. Hue are vigorously executed studies. A screen with a few black and white studies is worth attention. Miss Violet Lindsay's pencil-sketch of a girl's face is tender and pathetic; and Louis Godifroi's study from the lines—

> "In garret high, choked up with books,
> A scholar sat above the crowd,"

is a pleasing rendering of the poet. Among the other subjects, Emily Bardswell's small pen-and-ink drawings of Watermeet, Devonshire, finished in the style of an etching, display depth of tone. In the water-colours, "honourable" mention is awarded to Miss Beauchamp's "Abbot's Hospital, Guildford." a fine old piece of domestic architecture, with some dark panelling, and a peep of the staircase through an open doorway. The drawing is vigorously coloured; the dark brown, and the light and shade are telling. Genl. MacBean also sends a forcibly-drawn sketch of the leaning spire of Lahore, Brittany, characterised by boldness and depth of tone. It also receives honourable mention. The flower-pieces are various; many are studies of colour, as Miss Walton's White Chrysanthemums, the Narcissus and Broom, &c. Lloyd Jones's "Morning on Shore" is a sparkling bit of colour and study of a pebbly beach, and we may also casually name the contributions of Lady Dunbar, Mrs. Medlycott, Mrs. Alliott, Mrs. Blades, and other lady artists, who adorn the walls of the gallery by works of considerable merit. Much is due to the enterprise of Commander Niven and his coadjutors, in promoting the Institute, and to the management generally, for the discrimination shown in the award of prizes.

PORTLAND CEMENT AT THE INSTITUTION OF CIVIL ENGINEERS.

THE subject of Portland cement, and its cognate branch of concrete, have now for many years had much consideration at the hands of civil engineers, and their federated society encourage its members to record their experience and ideas on these important questions. The last session is more than usually prolific of papers, and their reading has called forth from many points much information, although, we think, of a somewhat conflicting character. The papers prepared by Major-General Scott and his colleague Mr. Redgrave, and that by Mr. Grant, may be regarded as strictly referring to Portland cement, while Mr. Bernays, in his contribution, treats fully of his experience in the concrete direction. In the present condition of the Portland cement question in England, it is somewhat disappointing to find so much reference to German experience, which now, and much to our discredit, seems to have outstripped English practice and knowledge. Our continuous efforts during the last twenty years to improve the quality of Portland cement by imposing certain tests, has, it appears, so far failed to impart the desired confidence to either producer or consumer. This is not to be wondered at, when it is remembered that the tests imposed by engineers are various in kind, and in many cases in direct opposition to the most reliable experience. The prominence given to the early schemes of "the Metropolitan Board of Works" gave an impetus to the use of Portland cement in drainage and Embankment works, which brought forth much discussion on the merits of this now well known cement, and thereby producing, all round, a more reliable knowledge of its valuable constructive properties. Sir Joseph Bazelgette, who spared no effort to produce, in carrying out his designs, the best quality of workmanship at his command, insisted that the Portland cement should be submitted to proper and reliable tests. He instructed his subordinate staff of engineers to impose certain defined examinations, and one of these officials, Mr. Grant, gave the "Institution" the results of these tests, in papers read before it in December, 1865, and April, 1871. The period which has elapsed since that time has witnessed the preparation of many papers and more substantial works, from various authorities and sources. The lead which the "Metropolitan Board" engineers, took in the cement direction, obtained for them a reputation at home and abroad which to some extent became misleading, for it led to a recognition of what has been called a "Board of Works test" whatever that may mean.

The original test, imposed under the advice of Mr. Henry Reid, was at the time of its introduction, a tensile strain of 400lb on the $2\frac{1}{4}$ square inches section, and from such a modest although at the time considered an onerous test, it has reached a value of more than double that amount. Such progress may be considered satisfactory; but, owing to the indefinite and fluctuating character of the more recently imposed tests, much confusion now begins to prevail. Testing has become more fashionable with engineers; but, unfortunately, every engineer almost having works of any magnitude under his control, wanders into some new scheme of testing, which he regards as the best adapted for developing the virtues of Portland cement. Various methods of testings have introduced a variety of machines, resulting in a complete congestion of one and the other, stopping the way, and preventing all sensible progress in this country. In the absence of any authoritative recognition, by any of the professional societies of which we are indeed well stocked, the most erratic tendencies have become developed. In the midst of this jumble of no doubt well-meant zeal of engineers and others, a slight glimmer of hopeful settlement of this vexed question breaks upon us through the production of these useful and instructive papers. It is at last beginning to dawn upon our intelligence that testing, to be reliable, should have the virtue of uniformity; otherwise its records must be deceptive and misleading. While in England during these many years our efforts have been more in the direction of discord than harmony, the constructive profession in Germany has, for more than three years, established by almost unanimous consent a uniform and inflexible system of Portland cement testing. Mr. Henry Reid, in his work on Portland cement, published in 1877, described most fully the German system, and recommended its adoption in this country. It now appears that even at this late hour the authors of these papers regard the adoption of the German system of testing as the most appropriate, and it may be said that in the voluminous records of the discussion and correspondence which followed from many sources that the desirability of such a test is beyond question. But the unanimity about the method does not extend to the machinery by which it should be performed. It is, however, agreed that a mortar instead of a neat-cement test is more likely to prove the capacity of the cement to bind the sand with which it has to be associated. Again, slight differences arise in the opinion of some as to the character of the sand to be used, and anticipations of difficulty in the agreements as to its quality. In Germany, however, this difficulty, if it may be so considered, has been met by the preparation, through sifting agency, of what is termed "normal sand" with which the cement is to be mixed in the desired proportions. It is to be hoped that unanimity will at last be reached, and that we shall speedily enter into the comfortable stage of really understanding what is the standard by which Portland cement is to be gauged. In Mr. Grant's paper especially we are bewildered by a mass of tabular results, more or less contradictory in character, and calculated, if seriously considered, to deter the student from entering upon a subject fraught with so much error and disagreement. It is needless for us to refer particularly to these inconsistencies both of English and German origin, but we will shortly allude to the confusion resulting from different forms of briquettes, and which seems, from its importance, to deserve particular notice. The Germans have decided and fixed on the form of their briquette, but we, unhappily, are disunited on this point. There appears, however, to be a desire to adopt the double wedge-shaped briquette, which Mr. Henry Reid characterised at the discussion of these papers, as an evidence of the "survival of the fittest," for he had recommended that form to Mr. Grant many years ago. It appears that Mr. Grant has for some time adopted the form in question, and Mr. Faija apologises in the reported discussion for having unconsciously pirated what he calls "Mr. Grant's pattern." There is much in the form, and this particular one realises higher tensile results than any of the numerous patterns now in use.

Mr. Bernays, during the interval between the reading of these papers and his reply, which was prepared after the discussion, made some experiments which strongly illustrated the different values obtained by various forms of briquettes. The tests were seven-day ones, and four different shapes were used. The briquette in the form of a double wedge gave 50 per cent. higher results than that derived from the original French briquette, which Mr. Grant started with in the beginning of his experiments, and 25 per cent. more than the form used by the experimentalist himself, on the dock works at Chatham. There need not, therefore, be any doubt about reasonable men, untainted with the desire for eccentricity, adopting what is there and elsewhere proved to be the form from which maximum results are obtained. The testing machine itself is, however, amongst the unsettled and ill-defined details of this vexed question, although the desire seems to be pretty general to adopt the double lever German model. There is not, however, so much difficulty about this, for we may feel assured that our mechanical ingenuity is quite competent to overcome whatever obstacles stand in the way in that direction. The cost of the machine, however, should be made as low as possible, without sacrificing accuracy or efficiency, so that all and every one interested may be in a position to test the cement for themselves, and get beyond the influence of speculative experimenters and testers. One would suppose, from the elaborate tables resulting from painfully-laborious research, that the qualities of Portland cement were still unknown; whereas it should be regarded as a simple compound of intelligible derivation, and devoid of danger when being used, if ordinary intelligence is forthcoming to challenge and reject its spurious qualities.

The manner of filling the briquette mould is another fruitful source of discord, and the amount of water used in mixing up the cement comes in for a large amount of attention as well as the temperature of the room, in which the experiments are made. While these and other less important differences continue to receive so much consideration at the hands of our engineers and architects, it is impossible that the cement-makers can make satisfactory progress. How can the manufacturer be expected to improve his cement, when the lines on which he is to travel for the ascertainment of its value are so badly defined, and in some cases inconsistent with each other?

Fineness of powder is receiving its proper attention in the new departure, for under the old system of testing this important point was disregarded. We would call our readers' particular attention to this point, because it must in the future receive much greater consideration than it has done. The manufacturers have invariably opposed all attempts to meet the requirements of fineness, for under the existing mechanical arrangements of their works, the desired standard is unattainable.

The test of weight is proposed to be reduced, and substituted for fineness of powder, and we trust that the necessary means will soon be forthcoming to produce cement as fine in texture as that now apparently produced with ease in Germany.

The papers on Portland cement are amusingly interlaced with hints to cement-manufacturers as to the conduct of their industry, as if the question of quality and testing of cement was not enough to absorb all the ability of the authors. The chemistry of Portland cement is also much dwelt upon, although without clearing away any of the mists with which that branch of the subject has been hitherto tantalisingly associated. This chemical question has not, it is true, received the required attention in this country, and although foreign chemists have for the last half-century speculated and theorised as to the behaviour of cements under different circumstances, no reliable results have been forthcoming.

The chemical combination is, as we are now well aware, the final outcome of the mechanically arranged raw material proportion, and the accuracy of the result depends pretty much on the character of the chalk and clay used in the manufacture. The author of one of the papers arrives at a somewhat arbitrary measure of the carbonate of lime, which Mr. G. F. White, an experienced manufacturer, disagrees with. One would have thought that the subject of the use of Portland cement, would have been quite enough for the genius of the professional element of the "Institution," without infringing on the domain of the manufacturing associates, from whom the practical details of their business would be more reliable and trustworthy. Mr. G. F. White has already contributed to the literature of the Institution one of the best and earliest papers on Portland cement, which for many years has been regarded as the most reliable paper on the subject that has been published under the auspices of the Institution of Civil Engineers.

From the study of the Portland cement contributions, we will shortly refer to the paper of Mr. Bernays, which deals with the subject of concrete; and from its being the experience of his own constructive operations at the Chatham Docks, may be regarded as the most valuable of this triple contribution. There is nothing of a speculative character about these records of concrete engineering, although we are almost startled at the amount of aggregate used for the main walls of the Chatham Docks. The proportions used are one of Portland cement and 12 parts of river shingle, which Mr. Bernays puts at a cost of 7s. 2d. per cubic yard, the cement value being 3s. 1d., and the gravel or shingle 2s. 5d., the balance being labour, &c. Such is the cost of the bulk of the concrete; but a facing of slag concrete (proportions 6 slag and 1 cement), costs 12s. 2d. per cubic yard, or a flint-faced concrete 14s. 2d. per yard. If these figures had been furnished by an amateur, we would have received them with suspicion; but being the practical results of many years' operations in the execution of Government docks at an important arsenal like Chatham, we are much struck with the remarkable economy displayed by the controlling engineer.

Mr. Bernays describes the causes which led to the use of Portland cement concrete in the Chatham Docks, and as it is very instructive we quote from the papers as follows—viz:

"Shortly after the commencement of the works, it was found difficult to secure steady and continuous supplies of freshly-burnt blue lias lime; still more difficult to secure its thoroughly fine grinding in sufficient quantities, and to preserve it, when ground, in good condition till required for use. It was also found that blue lias lime concrete, even when the lime was thoroughly good, and, as far as was known, properly ground and mixed in the best manner, did not always set well under water."

The works for the construction of the docks had been let stipulating that the concrete should be composed of 1 of blue lias lime and 6 of gravel, and it was not, therefore, considered advisable to disturb the contract, and the contractor was desired to estimate what quality of Portland cement concrete he could supply in lieu of that specified. It was found by calculation that a cement concrete having proportions of 1 Portland cement to 12 ballast could be substituted. Of this arrangement Mr. Bernays speaks as follows—viz., "Comparative experiments were tried with the materials in these respective proportions; and it was found beyond all question, that concrete made of 1 part of Portland cement and 12 parts of ballast, was in all respects better and more uniformly trustworthy than the lias concrete of the original specification."

The cement used by Mr. Bernays was specified to be of the quality of 112lb. weight per bushel, and a briquette of 2¼in. section had to bear, without breaking, a weight of 650lb.

Mr. Bernays attaches no importance to fineness of powder, unless the cement is of great weight, and in that case he thinks that the extra cost of grinding will outweigh the advantage derivable from its fineness.

We need not say that much difference of opinion exists on this point, and the information secured from the various tables in these papers, of both English and German experience, indicates that great value is secured from fineness of powder. Indeed, some recent experiments with Portland cement fine enough to pass through a sieve having 32,000 meshes to the square inch, prove that, even at that almost impracticable limit of fineness, marvellous results have been realised in the mortar and concrete direction. Neat-cement tests with such cement are not, however, satisfactory, as it is difficult to impart the necessary moisture, for when water is applied the cement forms itself into small globules, and behaves something like mercury when scattered.

Although the chemical investigations which have been made do not amount in practical value to very much, yet they are leading the way to a more sensible knowledge of what the particular action is which the cement exerts in contact with sands and gravel. Some time ago, a well-known writer on cement and concrete, argued that the indurating value of cement could be assessed from the resulting crystallisation of the mass in which it exerted its binding influence. This proposition did not at the time receive much favour, and we are glad to find that it receives the sanction of Professor Hayter Lewis, who at the discussion on these papers said: "It was clear that fineness was of the greatest possible value, because lime not thoroughly fine would not give that coating to the particles of sand which evidently constituted the strength of Portland cement. He had also been trying some experiments upon the rather curious property of the setting of cement, and he had been aided by one of the best mineralogists, who had been examining it with the microscope and using other tests. The conclusion at which he had arrived at was, that it was a kind of semi or imperfect crystallisation."

We should say that there can be no question about this, for an examination of many of our sedimentary rocks will show that much of their value consists in the beneficial influence of their cementing paste which has become crystallised.

If there is nothing strikingly novel in these papers and their discussion, there is much that is contradictory, which was in some degree unavoidable, due in a great measure to the desire of the Institution to focalise all available information from English and foreign sources. The time allotted to the discussion of these what may be characterised as important papers, was quite inadequate to do them justice, or enable those practical men who were invited to partake of this "Portland-cement banquet," to do more than silently acquiesce in the forms of reading and discussing. The replies by the authors of the papers were impossible under such circumstances; bu they appear *in extenso*, as well as long reports of discussions which those present on the occasion do not recollect to have heard.

Portland cement is essentially an engineers' question, and the absence of any remarks by the President of the Institution of Civil Engineers or any of the vice-presidents or members of the Council, strikes us as somewhat singular. The leading engineers, who control and direct the great works of construction in this and other countries, might have, on such an occasion, favoured their members and the public generally with some observations as to their experience of this important constructive material. Their silence on this occasion is to be regretted, as it indicates a want of appreciation and sympathy with their fellow-members and associates, who were at such pains to put before the Institution results of their valuable experience and suggestions for the future.

DOMESTIC DESIGN AND PLANNING.

THERE is no reason why an artistically-designed house should not be fairly perfect in all sanitary respects; why it should not be well and scientifically constructed, and be not only comely in appearance, but comfortable to live in. We think it was Sir Henry Wotton, in his old treatise on architecture, who said a bui'ding should possess three conditions—utility, firmness, and delight. It must be confessed that the age which artists are now so fond of looking back to for inspiration was intent upon convenience and comfort as the first consideration; the Jacobean and Queen Anne have been justly called homely styles, and architects and decorative artists are never weary of preaching homilies about the virtues of the modes of building 200 years ago. Can we say however that the revival is as good or as honest in its intentions as the original art? We are very much inclined to hesitate in drawing the conclusion that our architects are in all cases prompted by the motive which actuated our forefathers in arriving at the style they did. We might almost go so far as to deny that the plan of the house has anything to do with the external architecture. Is it not rather evident, from the kinds of houses we see erected in many of the metropolitan suburbs, that we have been just reversing the method of the seventeenth-century architect: instead of giving a convenient and comfortable house a plain-speaking exterior, we have been taking its exterior, and then have tried to fit a different kind of house to it. For any one seriously to say that we can arrive at the whimisical and elaborate details of Queen Anne as we see it at Holland Park, Hampstead, or any of our fashionable suburbs, by a simple and honest study of the plan, is to ask more than the most credulous can believe.

The fact is, tile-hung gables, quaintly-bracketed windows, over-doors, and pediments constitute the very poetry of the style, and must be introduced, at any cost to internal convenience. They give the "piquancy of artistic flavour" to the work, and the architect is satisfied if he can give a freshness to the ordinary appointments of the house.

One of the expedients resorted to is to contrive the staircase in a corner of the building by having as many landings or "half-spaces" as possible, the object being to exhibit turned and cut newels and balusters. We do not mean to deny that landings are better than long, ladder-like flights, so fondly cherished by the suburban builder who affects the "genteel residence"; but let common-sense dictate that where landings are numerous there should be corresponding width in the staircase. In some of the new houses near Primrose Hill, Dulwich, and other parts we are constantly reminded of the disingenuousness of this device; the imitation of a handsome staircase in some manor-house has been attempted, with the result of bringing ridicule upon the copyist. The same want of thoroughness is seen in the cramped hall; in the forced manner in which the dining-room door is thrust between the corner of stairs and angle of wall, and the irksome fashion in which a person coming out of one room would have to dodge to prevent a collision in the hall. If the offices are on the same floor the difficulty of avoiding the unpleasant passage through the hall from kitchen to dining-room ought to be lessened by the adoption of an irregular plan; on the contrary, we find that in many new houses no trouble has been bestowed to meet it.

Then we notice several houses where windows have been thrust in awkward corners for the purpose of picturesqueness, as, for example, in the corners of rooms, the only advantage which such curious positions secure being that a blank space of walling may be utilised for furniture; but the only thought the designer had in his mind was the irregularity of the exterior.

We fancy as regards windows, future builders and tenants will find it rather difficult to obstruct some of the window-lights, the right to which will be acquired by occupancy; we speak of those which are often introduced in the side-walls of houses. The spoiling of rooms by canted corners and breaks is a common mode of making an accepted design fit the arrangement of interior. Closets are useful, but they ought not to be made to conceal bungling planning, as we have sometimes noticed. Differences of floor-level are best managed at the staircase by adjusting the landings; but in many houses the difference is marked by dangerous steps in long passages, where a borrowed light only perpetuates danger and discomfort. If in Classic buildings symmetry influenced the plan to such a degree as to cause inconvenience, it may be said with equal truth the genuine Queen Anne was primarily influenced by plan, and the counterfeit is influenced by something of less merit than either. Let us take a few instances. The aspect and distribution of rooms is sadly sinned against by the fashionable builder. We sometimes see drawing-rooms north-east, and dining-rooms with western aspects. In regarding the elevation, he generally manages to place his entrance towards the front, with the object of presenting an attractive exterior, but with the frequent disadvantage of not securing the best aspects for the principal rooms. The builder of the 17th century distributed his rooms upon recognised principles, the south, south-east, or south-west invariably were given to the main elevations, and the entrance was placed on one side, or on the front least eligible.

The proportions and sizes of rooms are generally dictated by the breaks and other irregularities of the exterior; seldom by the width of tables and other furniture, the number of occupants likely to be seated at table, &c. In dining-rooms it is usual to consider the width of table and the space for chairs, allowing space for sideboard or fireplace and a walking-passage. This found, the length can be determined by the consideration of the number of guests, or be regulated by æsthetic considerations. Drawing-rooms are not necessarily restricted. They may be made of almost any proportion or form, allowance being made for comfortable seats. Recesses and bays form agreeable lounges in these rooms. The lighting and prospect are, of course, a primary consideration. A "dismal desolation" frequently reigns over the modern drawing-room, with its gilt mirrors and monotonous primness; but much of this is due to the mode of its construction, and its want of relation to the library, conservatory, or other more-frequented apart ment.

Again, one may constantly see such things as a large bay cut in half by a wall, the corners of rooms canted off to obtain entrance, and in fact, every device resorted to which the old planners strictly avoided. The comfort of town-houses much depends on their quietness—namely, the imperviousness of the walls to sound. Thick walls are one means of securing so desirable a condition; they also are useful in keeping up an equable temperature. But as sound passes most quickly through homogeneous substances, a hollow space, or wall with a cavity in it, is much more sound-proof than one of solid materials of the same density. The continuation of joists from one house to the next is an admirable means of conducting sound as well as fire, and should, for both reasons, be avoided. Good construction, as much as the proper location of rooms, contributes to the essentials of comfort in a house; but as long as the system of sketching a design proceeds on the same principle as making a slop garment, we cannot expect to find more than the artistic sense gratified.

THE ARCHITECTURAL ASSOCIATION PRIZE DRAWINGS.

THE Architectural Association medal and prize drawings were on view at the opening conversazione last Friday. The medal has been awarded this time for a design for a coffee-tavern on a corner site in a town. The frontages were given, and it was to comprise a bar and eating-room, smoking-room on the ground-floor, club and billiard rooms above, reading and secretary's room &c.; the whole to be built in conformity with the Metropolitan Building Act. The winner of the prize is Mr. E. M. B. Vaughan, of Cardiff, and it is somewhat remarkable that a provincial student should have carried it off from among so many London students. The drawings show a Gothic building of stone, rather more French than English in detail. The planning indicates study of requirements; the bar, placed along the short frontage, has a corner entrance, and is conveniently related to the eating-room, divided into six compartments for tables and seats, also to the serving-room, lift, and stairs. The smoking-room is provided at the inner end of site, and has a separate entrance, with lavatory and convenience attached. The staircase to upper floors is cramped and the space would have been better saved. It is lighted by a skylight, and there are ample conveniences. The author, however, has not well-lighted the billiard-room: the drawings only show one end window, and a little more space round the table would have been desirable. The club-room, as shown, would have been infinitely better for it. A large ½in. scale elevation of front is shown with some good detail, but the elevations suffer from a crowded appearance; and a little less fritter, and more breadth of treatment, in the upper story would have been preferable. A perspective view is sent in from which we gather that the effect of the canted angle entrance would be rather weak. The jambs are narrow and feeble-looking; and we think the angle pinnacles springing from carved corbels, and the heavy stilted arch in the upper story are not quite in keeping with the other portions of the work. The drawings, which we shall shortly illustrate, are neatly executed, and the workmanship is highly creditable to its author. In the Association class of design, Mr. J. L. Landsell carries away the first prize. His drawings are, as usual, distinguished for originality and freshness. We particularly mention among them the design for a stone pulpit, intended for open-air preaching. It stands against the angle of the building, circular in plan, and supported on a massive base with large engaged shafts. The rostrum of the pulpit is enriched by canopied niches with figures. The sketch design for suburban residence, half-timbered and tile hung, is clever. The entrances are well arranged, though the stairs appear somewhat narrow. The rooms are well disposed, and generally the plan has much that is meritorious. Another sketch, for a cottage in a row, is Gothic also in style, but a little heavy in detail, and probably the plan is the most creditable part of the performance. The staircase is central, well placed, and is lighted from a skylight over the first flight. The dining-room side with fireplace shows the author to be equally capable of designing decorative work. The dado is decorated with subjects representing the four seasons and English sports, and the drawing is spirited, in brown ink. We note, besides these, a sketch for a village-church, consisting of a short nave of two bays and one aisle—the nave is rather lofty; also a bank, in a Late florid style, French in detail, drawn freely in pencil, and vigorous in style; and an unfinished sketch of a Gothic villa, spirited in execution, showing some fair planning.

Mr. R. J. Lovell wins a second prize with a design for a London bank, in the Italian style, the chief feature of which is an order standing upon a rusticated basement, with an attic and small dormers above; the latter are rather insignificant in scale. The design for a church to seat 200, is a lengthened structure, and the sketches for suburban villa in brick and tile, and the house in a road, indicate study and improvement. Honourable mention is awarded to H. W. Burrows for several drawings showing undoubted merit. The sketch for village-church in sepia is the best, a broadly treated design design with apsidal end; the suburban cottage and bank both show breadth in composition and knowledge of Gothic detail; but the pulpit is too florid, and the colouring garish. The drawing of gates is lacking in unity of design; the panels of pointed form look rather out of place; in the dining-room recess some clever detail and drawing are shown; but we think the detail rather restless and wanting in quietness.

The Architectural Union Company's first prize seems to have gone begging, for we only see the second-prize drawings, executed by T. L. Houston, on the walls. These show the fine Perpendicular church of St. Mary, Gidney, Lincolnshire, a structure possessing some remarkable features: a nave and two large aisles of nearly equal width to it, a deep chancel, and western tower. We cannot admire the details, and we question the drawing showing the nave-arch springing, the mouldings of which are shown to spring in a line with the shaft.

The sketches of colour decoration, made by members of the Association, have been hung on the wall in a promiscuous fashion within a very limited space, and resemble rather a huge patchwork than a series of studies arranged with some regard for the colours, and with a little eye to sequence. This higgledy-piggledy selection, however, comprises a few clever studies, in which taste in both design and colour harmony are conspicuous. We may note the prize sketches of S. R. Smith, showing a variety of studies, and a good sense of colour as in his boudoir decoration. The ceiling of theatre, by Mr. Hulbert, and the same student's concert-room and dairy treatments, in low tints, are classical in taste and feeling; the boudoir study, by Maurice Hulbert, is a clever Japanese sketch, and H. W. Roberts has contributed some clever work, as his ceiling in the Louis Seize style. A. L. Lovegrove's tesselated pavement is also quiet in colour. In the half-house sketches we must bestow praise on the studies of Messrs. Smith, Hulbert, and Roberts.

Glancing at the work exhibited by the Elementary Class of Design, we find the first prize has been given to Cecil Haden Stock, for some creditable drawing. His study for an Italian cortile, the details of vaulting timber roof, &c., are praiseworthy. G. Blizard's drawings receive the second prize in this class for an open-timbered roof, a Roman triumphal arch, and a nave of church, all neat and painstaking in execution. The work of C. C. Bradley in this class is also worthy of the distinction it has received.

◆

OLD ST. PAUL'S.*

THE paper which I have the pleasure of submitting to you is founded upon the authority of the Register of Statutes, Dugdale's History, Wharton's Lives, the fragmentary notices in the Chroniclers and Leland's Collectanea, and the diaries of the Grey Friars, Wriothesley, and Machyn, with a few notes from Stowe. I have pieced them together like the broken fragments of a tesselated floor; the outlines are often blurred and faint, the colours worn and faded, the patterns in many parts imperfect and defective, but with the exception of Hollar's drawings, these authorities exhaust the materials at our disposal for reconstructing a view of Old St. Paul's. Documentary evidence is all that survives for our purpose, but I hoped that even a reconstruction on paper, shadowy though it must needs be, would be acceptable, since the glorious substance is irrevocably lost.

I.

At the very outset we are confronted with a difficulty, which it is not possible to solve decisively. The dimensions of the cathedral are a matter of dispute. The Short Chronicle, edited by Dr. Sparrow Simpson, states that a survey made in 1314 gives them thus:

Longitudo continet, 690 pedes.
Latitudo, 130.
Altitudo testitudinis occidentalis a pavinento, 102.
Altitudo testitudinis Novæ Fabricæ, 88 pedes.
Cumulus ecclesiæ continet in altitudine, 150 pedes.
Altitudo tunis campanilis continet a plana terra, 260 pedes.
Altitudo fabricæ ligneæ campanilis, 274 pedes.
Altamen in toto non excedit, 500 pedes.

Wharton (*a*) gives these measurements, the tower, 270ft., the spire, 274ft., the cross, 15ft.; adding that "Murimuth" gives the height of the nave (cumulus) 150ft., the height, 190ft. (?), &c., as above. Murimuth was a canon of St. Paul's.

We may conclude that the cathedral measured somewhat less than 600ft., so that, in size and dignity, which spaciousness never fails to confer, it was the largest in Christendom, and in beauty inferior to none.

William of Wyrcestre contributes a new mensuration—

The length of the nave, 180 paces.
The breadth of the arms (transept), north to south, 160 paces.
The breadth of the nave and aisles, 48 paces.
The length of the choir and Lady Chapel, 130 paces.
The breadth thereof, 48 steps. [Itiner. 166.]

Lastly, Mr. Edmund B. Ferrey affords another estimate—

	Ft.	In.
Length	596	0
Breadth	104	0
Height up to vaulting nave	93	0
Height up to vaulting choir	101	6
Height up to new work	98	6
Height of tower	285	0
Height of spire	208	0

Pepys says that the tower was reckoned to be about 270ft. high.

The length of the pace used by William of Wyrcestre varies, but on the average it may be fixed at about 1ft. 10in., so that the approximation to Mr. Ferrey's lies very close indeed, and as he has founded it on Hollar's plan, it is no doubt near the mark.

The Short Chronicle states: Tota ecclesia continet infra limites suæ 3½ acras terræ j½ rodam et 6 virgas. Sir E. Denison Beckett estimates the area in square feet at 72,460, and the dimensions thus:

	Ft.
Length	586
Nave	280
Transept	300
Width	96
Height, vault of nave	103
Height of steeple	527

II.

The architectural details may be fitly left in the hands of the professional members of the society; my concern is wholly with the history of its building. In the episcopate of Mellitus, Ethelbert, King of Kent, built the first church; St. Erkenwald bestowed much on the enlargement of the fabric (*b*). In 962 it was restored after a disastrous fire. It was on the eve of St. John Baptist, when flames were seen rising near the west gate of the city, and overlapping the church towers; no effort of the citizens, startled out of their midnight sleep, could arrest the fire. It seized the wooden circlings, split the walls, consumed the ornaments; the falling beams shivered the floors (*c*). On July 7, 1087, the cathedral and all that was in it were burned up. Bishop Maurice commenced its complete restoration, designing a work which in the eyes of many seemed incapable of completion, one which he purposed should be the honour and glory of London. He laboured on it during twenty years, completed the crypts and part of the superstructure, and bequeathed the completion to his successors. Bishop Richard de Belmeis I., 1108-1128 (*d*), devoted his revenues to the work, and procured from the King a grant of the ditch of the Castle Palatine to enlarge its site. He added to the rising walls in a marvellous manner, bought up the roadways near it, which were blocked by the houses of the townsfolk, at his own cost, and girdled the close with a strong wall (*e*).

"Verily," says William of Malmesbury, "the Cathedral of St. Paul is a monument of the generous spirit of Maurice; so great is the magnificence of its fair beauty that it justly claims a place among famous structures. Its crypts are so spacious, its upper church is so large, that the densest crowds could find room within its compass." Though Richard followed, bestowing all the revenues of his see upon it, maintaining himself and his household on other means, no progress was apparent; and the zeal which he had manifested at the commencement of his episcopate, as years went by insensibly languished and died out (*f*).

In 1137, again, the cathedral was burned, and Bishop Gilbert Universalis, 1128-1134, is said, before his accession, to have added roofs and smoothed all the rough places. In 1141-51 six tapers ever burning in the cathedral are mentioned. The repairs were made, and henceforth a distinction occurs between the western and eastern portions of the cathedral, the former being known as the old, the latter the new work, and both placed under different masters or wardens, and supported by separate funds. Bishop Eustace de Falconberg, 1221-1225 (*g*), resumed the work on the fabric; the *Campanile* was completed in 1221; and the foundations of the *New Choir* (*h*) were laid above the crypt in place of the Norman building of Maurice, which had suffered by fire (*i*). It narrowly escaped destruction in the very year when the stalls were in course of erection (*j*).

A terrible storm broke over the church on St. Paul's day, 1230, when the bishop stood mitred at the high altar, and the Gospel had just been read; a darkness like a pall fell upon canon and crowd, so that one could not see the face of his fellow. Then the thunder burst with a peal so loud that church and the tower, struck by a thunderbolt, seemed falling upon their heads, followed by lightning so vivid that the building appeared to be on fire; for half an hour lambent flames played round wall and pillar like a great veil or banner waved by a strong wind. A fearful stench pervaded the aisles, and all present incontinently fled, treading down and killing each other in their wild haste, save the brave bishop with his single deacon, who, when the sun shone out again, recommenced his solemn office [Matt. Par. II. 321.] (Ann. Dunst. s.a.)

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* A paper by Mackenzie E. C. Walcott, B.D., F.S.A., Precentor of Chichester; read before the members of St. Paul's Ecclesiological Society, Nov. 4th, 1880.

On Oct. 1, 1240, the new choir was consecrated by the bishop in the presence of King Henry III., the Legate Otto, the primate, six prelates, and many noblemen, who were invited to a banquet on that auspicious day. (Matt. Par. II. 438. Dugd. II. Oxenedes 186.)

Bishop Fulke Basset, 1244-1259, who found all the roofs in a state of dangerous decay, owing to a succession of violent storms, began the erection of St. Faith's church, an extension of the crypt eastward, on the site of the new market, which had been granted by King John in 1205. The same year, 1256, saw the commencement of the transept; but the foundations of the entire eastern development of the cathedral, Nova Fabricæ Beatæ Virginis, including the feretory of St. Erkenwald and the Lady-chapel, had been actually laid in 1251. As Pope Innocent III. said, the chapter designed to finish a work begun in a very sumptuous style. In 1300, all offerings made in the cathedral were devoted to this building, but sixty-one years passed away before its completion (*k*). Bishop Ralph de Baldock, 1305-1313, before and after his accession to the episcopal throne, toiled on the accomplishment of the new work of the Blessed Virgin, founded and begun at the head of the famous church of St. Paul on the east, giving 200 marks yearly towards it. In 1312, the marble pavement was laid down, and within three years a great portion of the spire (*l*), which had become decayed, was rebuilt after a nobler fashion, and capped with a large cross and ball, which Bishop Gilbert de Segrave blessed on Oct. 4, 1314. On May 21 in the same year he dedicated the altars of Our Lady, St. Thomas Martyr, and St. Dunstan in the new work (*m*). In 1331 the bell of St. Mary in the campanile was consecrated by the Suffragan Bishop of Corbana at Pentecost (*n*); in 1316 the old work and bell tower had required costly repairs (*o*), and in 1339, the latter being completely restored, a solemn procession with lights, walking in silk copes and barefoot, carried the relics which were placed as a talisman against fire in the cross (*p*). On March 24, 1339, Bishop Richard de Bynteworth consecrated the high altar (*q*) in honour of St. Paul, with two collateral, called the capitular, altars, that of St. Ethelbert on the north, and that of St. Mellitus on the south side. On May 21, 1382, an earthquake shook down the cross (*r*). On Feb. 1, 1444 (*s*), the roofs and steeple caught fire from lightning, and though it was quenched by the brave Morrad, mass priest of Bow, the damage was not completely repaired before 1462. At 3 p.m. on June 4, 1561, lightning, or a plumber's carelessness, set the church on fire (*t*). In 1666 came the Great Fire, and "the miserable sight of the church with all the roofs fallen, and the body of the quire fallen into St. Faith's Church." Then the destroyers set to work pulling down church and tower; and it was seen how "the late church was but a case wrought over the old church, for you might see the very old pillars standing whole within the walls of this." The battering-ram and gunpowder mine finished the work of demolition.

In a slight sketch on the margin of an MS. in the British Museum, outlined by a monk of St. Alban's in the 14th century, the soaring spire of St. Paul's is seen over a superb Decorated west window flanked by narrow towers, which are covered with low spires. One of these was Lollard's Tower; an Elizabethan writer (*u*) says that "he passed through Paul's up to the Lollard's Tower, and after that turned along all the west sides of Paul's, through the wall, and passing through six or seven doors came to a tower right on the other side of Lollard's Tower, as high almost as the battlements of Paul's; whoso walketh in the bishop's outer-gallery going to his chapel, might see the prison window." Before entering the church I may premise what are its peculiarities:—

1st. The equal length of the western and eastern arms, as at Worcester, and, consequently,

2nd. The central position of the steeple.

3rd. The deflection of the axis of the eastern arm, as Mr. Penrose has pointed out.

4th. The continuous-roof over the whole eastern arm, as at York, Lincoln, Ely, Selby.

5th. The aisles both on the west and east of the transept, as at York, Westminster, Wells.

Outside the great western doors, opened only to admit a royal or episcopal procession (*v*), the tombstone of Bishop Michael de Northburg (1361) by its inscription and position put passengers in mind to pray; in the nave were buried, in the centre toward the west, Bishop William; his tomb was yearly visited even in the 17th-century by the citizens of London in gratitude for his services in procuring for them a charter of their privileges from William I. A noble shrine was afterwards erected above his grave (*w*); Bishop Kempe, the builder of Paul's Cross, buried in the Trinity Chapel, between two pillars on the north side in the second bay from the crossing; Bishop Hill, buried in 1496, and Bishop Fitzjames, 1521 (*x*), in a chapel of wood next the steeple; on June 4th, 1561, when the steeple was struck by lightning, "the belles fell below wher the grett organes stod beneathe the chapelle wher the olde byshope was bered ondur." (*y*).

We now pass in front of the rood loft, with its two lateral altars, one of the Holy Rood; its canopied niches filled with images of kings, and its Rood, Mary and John, springing from delicate bands of open tracery above the cornice (*z*). Near it probably was the clock, "having the image of an angel pointing the hour both of the day and the night" (a^1).

On the south side of the nave, facing the Trinity Chapel, was the Chapel of St. Mary in the nave, between two pillars, opposite the Chapter-house door; that is, the N.E. processional door to the cloister, "above the altar" stood the glorious image of the Blessed Virgin. A lamp burned before it at night and an anthem of our Lady sung after matins; to the adjoining pillar an iron box for oblations was attached. [Dugd. 19, 27, 36, 39, Wharton 103]. Bishop John de Chishull founded a chantry here.

In the adjoining bay next to the crossing was the tomb of Sir John de Beauchamp, [1374] with his recumbent effigy sheathed in armour. [Dugd. 36, 52.] His chantry was kept at "that little altar situate neer" to it. His tomb was known as "Duke Humphrey's," although that ill-fated prince is buried at St. Alban's; and the dinnerless loungers of the time of Elizabeth were said to dine with Duke Humphrey. At the base of one of the pillars was carved the foot of Algar, the first prebendary of Islington, and the Pes S. Pauli became the standard measure for legal contracts in land, as the arms of Henry I., Richard I., and John furnished the length of the ell. Upon the floor of the aisles a single line, and up the central avenue two parallel lines, marked the pathway of processions which vested in copes and leaving seven feet between each file, were guided by them in keeping due distance and directness in movement. Similar lines may be traced on the pavements of Chichester and among the ruins of Dale Abbey. What a noble space did they traverse between those twelve stately arches on either side, as grand as those of Winchester, Bury St. Edmund's, and Canterbury; more regular than St. Alban's, with finer proportions than Norwich, vaulted with stone, and, therefore, outvying its other Norman rivals of Peterborough and Ely, and equalling in height the soaring aspirations of Westminster and exceeding that of York.

The view from the western portal was magnificent; beyond the double range of clustered columns, standing like colossal warders on either side, were the broad, deep-set triforium, the lofty clerestory and continuous shafts supporting the arched vaulting. A flood of light was poured down from the tall windows of the lantern of the central tower upon the crossing, the imposing flight of stairs necessitated by the crypt below the choir, and rivals of those of Canterbury and Winchester, which led up to the rood-loft, beyond which, in the misty distance, appeared the upper curves and brilliant glazing of the rose window, 40ft. in diameter, which had only two parallels—those of Lynn and Durham. To its tracery and that of the adjoining windows Chaucer alludes in his description of Absolon, the parish-clerk

> "With Paule's windows carven on his shoes."

Two canopied doorways, of fine design, gave acces to the choir-aisles from the transept. "In the Lower Church were St. John's Chapel, Morning Prayer Chapel, Long Chapel, St. Katharine's Chapel, Bishop Kempe's Chapel, one place under the clock-house, and a chamber in the clock-house which the bell-ringers lodged in times past, two severed places. The chapels below the steps were St. John's Chapel, Long Chapel, and St. Katherine's Chapel" (b^1). Hollar's ground-plan shows two chapels in the east aisles divided by parcloses.

The Chapel of St. John the Evangelist stood near the great south door (c^1).

St. Catherine's Chapel (d^1) contained a chantry, founded by Bishop Basset 1244—1259, and was newly-built by Dean de Bruera in 1354 (e^1). In 1332, its altar-keeper of St. Catherine was specially exempted from giving the offerings made there to the New Work, to which all other collections in the alms-boxes were devoted. Her day was celebrated with special honour, as on it "the light (with torch and taper) went about the steeple at night, and the singing-men of the quior with the children singing anthemes" (f^1). As the access to the tower was on this side, the altar probably stood in this wing.

In the north wing was the

Chapel of the Holy Ghost, newly built, it is said in 1364, near the north door, behind the cross in the north arm towards the great door. (g^1) It had a chantry for seven chaplains, founded by Chancellor Holme. "Where this altar stood," Bishop Bonner's chaplain said, "the new bishops sat in the judgment of such as be Catholic." (h^1) There was also a *Chapel of St. John the Baptist* (i^1), connected with a Chantry of Beatrix de Roos next the north door. It was founded by Lord Mayor Poulteney in the reign of Edward III. (j^1) In it the choristers daily sang an anthem of Our Lady after Compline. (k^1) Here there was also, it would seem, an altar of St. John the Baptist in the new work on the south side, which is mentioned in 1320. (l^1) Richard de Gravesend founded a chantry at the altar of the Baptist, and was buried near Bishop Sandwich. (m^1)

The principal object in this wing, as at St. Alban's, was the famous cross (n^1), before which stood an altar with a taper always burning. Oblations for the use of the dean and chapter were freely given to its offering-box or pyx. Near it was the tomb of Bishop Martin, of St. David's, where the choristers sang the anthem, "Sancte Deus Fortis." The miraculous cross was said to have been found by King Lucius during a Thames flood.

The Altar of St. James is mentioned, 1141-1151, as "situate under the cross in the north part of the church." (o^1)

The following altars also occur, which may have been placed between or against pillars, but their sites are not traceable:—

St. Andrew's. (p^1)

St. Ypolite's, a very rare dedication.

St. Ceadde's, founded under a local dedication by treasurer Swereford before 1247. (q^1)

St. Edmund the Archbishop's, mentioned with *St. Edward the King's* in the 13th century. (r^1) In 1458, Canon Sherryngton founded a chantry.

St. Nicholas', in 1247, in a chapel of SS. Mary and Nicholas, near the north door.

St. Sylvester's, in the time of Edward II., a very rare dedication. (s^1)

The altars in the Presbytery were the—

High Altar of St. Paul, the *Capitular altar of St. Ethelbert* (t^1) [patron of Hereford], mentioned in 1247, and *the other collateral altar of St Mellitus* (u^1) [a local dedication], each with a shrine above it.

The Presbytery called the Sanctuary in the Register appears in later days as the Upper Choir, as the New Work became the Chauncell. (v^1) Bishop Savage, in 1447, was buried in the presbytery. Fitzhugh (w^1) was buried in the midst of the choir, southward, a little above the bishop's see, under a marble stone inlaid with brass. (x^1) Bishop le Noir's tomb (y^1) stood in the enterclose on north wall of the Presbytery (z^1), a little above the quire. Bishop Chishull was interred in the north wall opposite the choir; the tombs of Kings Sebba and Ethelred were recessed behind a stone screen in an adjoining bay near the Gaunt Chapel.

The high altar had a fine reredos, and sedilia adjoined it on the south side facing the canopied tomb of John of Gaunt, upon which were suspended his cap of maintenance, helmet, lances and "targe of horn." The following extract, illustrate the original arrangement, with the lateral metal screens.

1549. Whitsondaie the canons and pettie canons in Paules left off their grey and calabre amyces, and the canons wore hoods on their surplices, after the degrees of the Universities, and the pettie canons tippets, like other priests.—Wriothesley II. 14.

1549, June 3. All the grey ammasse, with the calabre in Powlles were put down.—Grey Friar's Chron. 59.

1550, April 19. All the Comunyon tyme the byshope commanded the lytt of the aulter to be put oute, or he came in to the qwere.—Grey Friar's Chron. 66.

1550. S. Barnabas day at nyght was the aulter in Powlles pullyd downe, and as, at that day, the Vaylle was hengyd benethe steppes, and the Tabrell set up there.—Grey Friar's Chron. 67.

1550, June 13. This year against Easter the Bishop of London altered the Lord's Table that stood where the high altar was, and he removed the Table beneath the steps into the midst of the upper quire in Paul's, and at the ends east and west, the Priest standing in the midst at the Communion on the south side of the board. After the creed sung, he caused the veil to be drawn, that no person should see but he that received, and he closed the iron grates of the choir, on the north and south side, with brick and plaster that none might remain in at the choir. —Wriothesley II. 47.

1550. The xxij. day of Marche was the grattes besyde the Hye Alter in Pawlles closed up, that the pepull sholde not loke in at the tyme of the Cammunyon tyme, and the Veyle hanged up. The xxviij. day was Ester Evyne, and then was the Tabelle remeyved and sette beneth at the Veyle north and south.

1551. The xxvi. of September; the stondyng at the Tabelle in Pawlles was removed into the sowth.—Grey Friar's Chron. 69. 71.

1552. After the feast of All Saints, the upper quire in S. Paul's where the high altar stood was broken down, and all the quire thereabout, and the Table of Communion was set in the lower quire where the priests sing.—Wriothesley 79.

The xxv. day of October was the plucking down at the commandment of the Bishop N. Ridley, of all the goodly stone wall that stood behind the high altar and the place for the priest, deacon, and sub-deacon.—Grey Friar's Chron. 75.

1552, Sept. 4. The queer of Pawlles had a commandment from the dene from Cambridge, at the bysshope of Cantobere's visitation, that he shoulde leve the playinge of organs at the Devyne Servys, and soo lefte it.—Grey Friar's Chron. 75.

1552, Nov. 1. The prebendaries of Pawles left off their hoods, and the bishops their crosses, so that all priests and clerks should none other vestments at service or communion, but surplices only.—Wriothesley II. 79.

1559. Saturday, the 12th of August, the aulter in Paule's, with the Roode, and Mary and John in the rood loft were taken down, and the prebendaries and pettie canons commanded to leave off the grey amices of fur, and to use only a surplesse in the service time, by the commanement of Dr. Grindale, Bishop of London elect, Dr. May, the new Deane of Paules, and others of the Commissioners.—Wriothesley II. 146.

This new rood was set up in Q. Mary's time, and was the object of a profane jest related by Foxe.—Actes III. 114.

It was during these changes that the so-called tomb of St. Erkenwald, to be paralleled only with that of the "overthwart bishop" of Salisbury, was set up in its anomolous position, defiant of ancient Christian precedent, north and south at the back of the new altar piece. St. Erkenwald was at first buried in the nave, and translated into a shrine on Feb. 16, 1140. (a^2) On Nov. 14, 1148, he was translated into the east end and laid in a superb shrine. On March 21, 1314, Bishop Segrave (b^2) laid the first stone of a new shrine in the new chapel of St. Mary, whither he was removed on Feb. 1, 1325, from near the high altar, as great inconvenience had resulted from the crowding of devotees.

The shrine of St. Erkenwald "stood on the east side of the wall above the high altar," that is the reredos in the feretory, and had its own altar on the west side. It blazed with gold, silver, and precious stones, and the offerings of royal and other visitors. The iron gate tinned over, made 1448 by Stephen Clampard, cost £641. The parclose of metal which inclosed it stood 5ft. 10in. above the floor. A guild or fraternity attended the altar [Dugd. 23-28]. The shrine thus occupied a paralled position to those of Canterbury, Winchester, Westminster, Ely, Lincoln, Durham, and Bridlington. Bishop Clifford was buried (c^2) near the place where the shrine of St. Erkenwald stood, towards the south. The names of the chapels, in 1598, in the chauncel, the novel appellation of the new work, were the Lady Chapel, St. George's chapel, St. Dunstan's chapel, the Duke of Lancaster's chapel, the dean's chapel; (d^2) there were also "severed places" including the vestry and chamber office. Three chapels on the south, and one, the Lancaster or Gaunt chapel, on the north, were erected between buttresses as at Canterbury, St. Alban's, and Lichfield. (e^2)

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a, Vitæ, 116. *b*, A. S. Chron., S. A.; Leland Collect, I., 21. *c*, Registr., 77; Dugd., 4. *d*, Wharton, 45; Dugd., 5, 6. *e*, Leland, I., 21. *f*, Vesta, Pontif. lib. II., § 673; Dugd., 5; Registr. u.s., Leland u s., Dugd., 7. *g*, Ann. Dunst., s. a. *h*, Wharton, 83. *i*, Dugd., 12. *j*, Registr., 91; Wharton, 93, 94; Dugd., 12. *k*, Short Chron., 5; Dugd., 14; Wharton, 111. *l*, Wharton, 116. *m*, Short Chron., 6. *n*, Ibid, 14. *o*, Dugd, 14. *p*, Short Chron., 15. *q*, Ibid, Wharton, 127. *r*, Wharton, 129. *s*, Dugd., 96; Polychron. Lib. 8, cap. xxiii. *t*, Pepys' Diary, 320. *u*, Philpot, 87; Foxe, II, 12; Pilkington, 540. *v*, Dugd., 34; Wharton, 132. *w*, Godurn, 140; Wharton, 91; Dugd., 51. *x*, Godw., 153; Will. Vox, 33; Godw., 154; Lans. Ms., 249; Wharton, 183. *y*, Machyn, 259. *z*, Foxe Actes, III., 114; Wriothesley's Diary. II., 146. a^1, Dugd, 22. b^1, Registr., 277. c^1, Registr., 278. d^1, Wharton, 94. e^1, Registr., 101. f^1, Wriothesley's Diary, 104; Pilkington. g^1, Dugd., 35, 36. h^1, Pilkington, 483. i^1, Sloane M.S., 4,938, fo. 91. j^1, Dugd, 31. k^1, Dugd., 28, 29, 30. l^1, Wharton, 104. m^1, Bale, 89. n^1, Dugd., 21; Leland Collect, II., 314. o^1, Dugd., 8, 11, 26, 33. p^1, Dugd., 41. q^1, Dugd., 25. r^1, Dugd., 14, 150. s^1, Dugd., 29. t^1, Dugd., 25. u^1, Leland Coll. II., 362. v^1, Wharton, 175. w^1, Wharton, 163. x^1, Godwin, 152. y^1, Godwin, 145. z^1, Wharton, 88; Wharton, 103. a^2, Wharton, 18. b^2, Short Chron., I., 6. c^2, Godwin, 150. d^2, Registr., 277. e^2, Dugd., 37.

(*To be continued.*)

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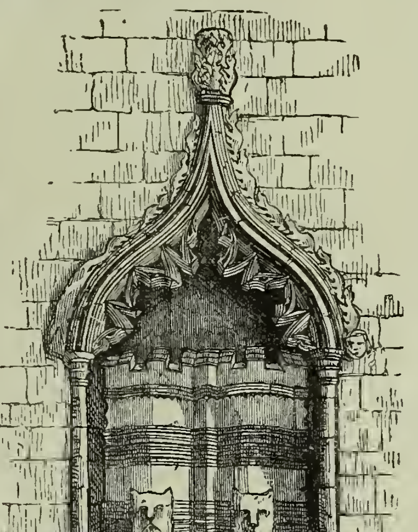
HOLIDAYS IN HOME COUNTIES.*

LAST summer we noticed in these columns a collection of short historical and topographical articles, written by the author of "Our County Families," and of the greater portion of "Old and New London," and published as "Pleasant Days in Pleasant Places." Mr. Walford has again selected an alliterative title, and in a second and somewhat bulkier companion volume, treats in pleasant style on a number of interesting towns, villages, and districts within a day's excursion from London.



The Norfolk Burnhams, Chiswick, Dover, Chertsey, St. Alban's, and Gorhambury, Ely, Stoke Poges, and Boxgrove, are amongst the places dealt with in the fresh and chatty manner which characterises Mr. Walford's works. The aim has been to suit a popular rather than a scientific taste; but the architectural descriptions are accurate so far as we have tested them, and although the papers bear traces of having been written some years since, the information is throughout corrected to the present date. "A Day at Harold's Tomb" furnishes a heading to an interesting chapter upon Waltham Abbey, in which the theory that it marks the resting-place of the last Saxon king is maintained, the growth of the convent and of the little town around it is traced, and a description is given of Mr. W. Burges's restoration of the abbey, carried out in 1864-5. The castle and cathedral of Rochester are the subjects of another paper, and the recent laying-out of the castle-grounds as a pleasure-garden, and the restoration of the choir of the cathedral are duly chronicled. Speaking of the chapter-house doorway in this minster—a feature almost as well-known as the rich Transitional west portal—the author condemns the manner in which the cast at the Crystal Palace has been coloured, and mentions that another cast is to be seen at South Kensington. The tombs of the Russells at Cheneys, "marked," it is observed, "by a splendour and magnificence rarely matched in England, save at Westminster," afford material for a third paper, and the ruined manor-house of Brambletye, near East Grinstead, the churches and remains of monasteries at Dover, and Gilbert White's house at Selborne are amongst other interesting chapters. The volume is illustrated by about a score engravings of the places described, some of them reductions of well-known pictures, effective and doubtless sufficient for the purpose; they are executed in a sketchy manner, the details being vague and indetermined. A copy of a drawing by J. W. M. Turner, limned in his early artist days, and now in the possession of the Rev. H. R. Wadmore, forms a frontispiece; the subject, picturesquely treated and somewhat idealised, is the massive Early Norman tower of St Mary's Church, Dover, as seen across an opening of streets. We reproduce, by the publisher's permission, one of the more strictly architectural illustrations, that of the Late 14th-century lavatory in Battle (i.e., the "embattled") Hall, near Leeds Castle, Kent. The hall is now used as a farmhouse, and the lavatory, which adjoins the remains of a screen in an inner room, and is well carved in stone, has been described by some writers as a holy-water stoup, although our author denies that it has ever had other than a domestic purpose. There is no acknowledgment of the fact in the book; but we believe that most of the papers have appeared in the pages of one of the lighter serial journals. However, the volume is pleasantly written and attractively got up, and will doubtless afford suggestions for disposing of many a summer's half-holiday.

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ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary meeting of the session 1880-81 was held on Monday evening, the President, Mr. John Whichcord, in the chair. Numerous donations to the library were announced, and acknowledged with thanks, the President making special reference to a small collection of the original drawings made by the late Mr. Owen Jones for his well-known "Grammar of Ornament," which had been presented by his sisters. Certificates of proficiency obtained in the recent voluntary examinations were awarded, by the President, to Messrs. John Bradshaw Gass, Frank Johnson, Goldsmith, Henry Hardy Kemp, Philip James Marvin, and Lawrence George Summers. The Secretary made a correction in the instructions to candidates for the Soane Medallion: it appeared to the Council that the conditions for the subject, a county-court, were somewhat ambiguous, and instead of the words "total area 10,000 square feet," should be substituted "total area of site to be covered limited to 10,000 square feet." The following were admitted to membership:—As Fellows: Charles Nightingale Beazley, Guildford-street, W.C.; and James Allanson Picton, F.S.A., Sandyknowe, Wavertree, Liverpool. As Associates: George William Watson, Department of Public Works, Melbourne, Victoria; Alfred Aitchison, Harley-street, W.; Augustus Rovedino, Craven-street, Strand, W.C.; Charles William Reeves, Guildford-street, Russell-square, W.C.; Arthur Ashbridge, Leadenhall-street, E.C.; Henry Leopold Foster Guermanprez, Beaufort-street, Fulham-road, S.W.; Sydney Vacher, Stanley-crescent, W.; John Edward Bale (Capt. 1st West India Regt.), Sierra Leone; and Hugh Stannus, Kennington Park-road, S.E.

INAUGURAL ADDRESS.

The President then delivered his opening address. In referring to the deaths of Professor E. M. Barry, Benjamin Ferrey, and Thomas Henry Wyatt, he remarked that the two latter, with another still living, were trustees of a sum of about £500, which will revert to the Institute for benevolent purposes on the death of a person now in middle age provided that before then the Institute shall possess a charitable fund for the relief of architects, their widows and orphans. Mr. Wyatt strongly urged the formation of such a fund, knowing that the Architects' Benevolent Society could not be described as having been founded by the Institute: this was accomplished a short time ago, and at the same time the original trustees were replaced by three new ones, viz., the eldest sons of Wyatt and Ferrey, and the present President of the Institute. Having alluded to the election of Mr. J. L. Pearson, the latest recipient of the Royal Gold Medal, as a Royal Academician, the President dwelt upon the invidious duty devolving upon the Council in making a recommendation for this medal, and reminded the fellows of the power they possessed to recommend and nominate some other person. Should such a step be taken, the Council would either withdraw their own candidates, or submit the two names for election to the general body of fellows. During the ensuing session, important modifications of the proceedings at their meetings would be tried. The preliminary business, which now, as on that evening, often took up more than half an hour, and which he was told had been irreverently called their "parish" business, would be reduced to a minimum. Balloting for new members would only take place at four of the fourteen sessional nights. At the meetings devoted to the reading of papers and discussions, the paper would be begun immediately after the reading of the minutes, and it would be possible to adjourn discussions to the following meeting. The papers would be reduced in number from 10 to six, or at most eight; and two evenings, January 3rd and February 28th, would be devoted to the consideration of professional questions, and of observations, protests, or suggestions relating to the interests of the Institute and the profession which might emanate from the general body of members. The annual election of members and of the board of examiners, under the Metropolitan Building Act, as well as the debate on the Council's report, would take place during the General Conference of Architects. The Conference meetings will thus occur at an interesting period of the session, instead of, as before, at the fag-end of its work, and the final sessional meeting will have been held before Whitsuntide. He expressed a hope that by the reduction in the number of papers a better class of paper than it had been for some years possible to obtain would be offered. At the same time, he did not admit that the use of the Institute was impaired because only a small minority of members attended the meetings. To carry on, at the recognised headquarters of the profession, official duties affecting their interests as a corporate body; to promote and facilitate uniformity of professional practice; to secure, as far as possible, integrity of practice; to consolidate step by step the foundations already laid of that examination which he thought would raise the character of an architect in public opinion, and debar unfit and ill-educated persons from the profitable exercise of their calling —these formed silent and efficacious work done by the Council and committees. A report and scheme for the compulsory examination had been prepared by a committee, and would be brought before the members for discussion at the meeting on January 3rd. The next examination, to be held in June next, would be the last of a voluntary character, and all new candidates would have to pass in both the artistic and scientific sections, while those who had passed in one section must pass in the other next June, in order to obtain a certificate. The report would recommend that the compulsory examination should have reference to professional study and practice only; the difficulty of deciding on the artistic capacity of a candidate would be reduced to a minimum; and the programe, as drawn up, not only included practical tests of both geometrical and freehand drawing, but the probationary work required from each candidate was likely to afford means for testing his natural aptitude for the arts of invention and design. He was also pleased that it was proposed to devote an entire day to examination on the nature, qualities, and value of building materials. He believed that every requirement which a person seeking to be an architect should possess was embraced in the proposed requirements; nor did he see in their tenour anything to deter the "heaven-born artist" from obtaining admission to the Institute. On this last point Mr. Whichcord quoted, with approval, Rondelet, who, at the beginning of this century, described the architect of his day as a decorator rather than a constructor, and asked: Would Rondelet, if he lived at the present time, define an architect in language more palatable to our own sense of what he should be? Are we quite sure that the cry for art, more art, in which I admit this country was long deficient, has actually provided us with what we required? Has not the tendency in England of late years been to unduly exalt the art at the expense of the science of architecture? Architectural science is gradually becoming the speciality of men who are not, and who do not pretend to be, architects. The construction of aqueducts, roads, terraces, gardens, fortresses, bridges, seaports, viaducts, was once and still lies within the domain of architecture; yet few in England employ an architect on such works. In France, the best Parisian architects still edit works on the building legislative enactments of their country, and advise upon such subjects; in this island there is a growing tendency to leave matters connected with building legislation to surveyors. In France, the planning of new thoroughfares, the laying out of public places, the daily charge of architectural monuments, the care of great estates both public and private, is retained by qualified members of our profession; in England such duties are often relegated to all sorts of persons. Our local governments and municipalities, indeed many great owners of the soil, prefer to be advised by men who ostentatiously discard connection with the picturesque and artistic elements of professional practice. We are more or less to blame for this state of things. Though thirty years ago there was plausibility in the successful efforts to stimulate the pursuit of architecture as an art, the necessity for such stimulus has now in some measure ceased, and the object of all thoughtful practitioners should be to reclaim much *bonâ fide* practice diverted from its legitimate course—to foster in younger men a regard for that scientific learning and mental excellence with Philibert Delorme preached, and which our own Sir Christopher Wren demonstrated to be worthy the pursuit of an artist. The efforts of others to accomplish the work which would, in earlier days, have been entrusted to architects, might be viewed with doubtful satisfaction. The system adopted in forming new thoroughfares in the West-end of London, for example, was to connect a series of existing streets by removing blocks of old houses which divided them; by pulling down one side only of such existing streets, and driving the new thoroughfare along a necessarily tortuous and irregular line—a line formed by the untouched sides of streets, often of miserable dwellings originally erected without regard to either convenience or salubrity. Such was the mode in which the new street connecting Oxford-street and Old-street had been made; such was the mode in which the purlieus of Soho were about to be penetrated. The result would be, he predicted, that there would remain on one side of the way for thirty and more years after the roadway of these new thoroughfares had been completed, or at least until existing terms of leases have fallen in, an irregular line of disjointed blocks, huge and lofty; on the other side of the way rows of old and dingy tenements, with here and there a new building raised in the air over its squalid neighbours, and acquiring in due course prescriptive rights over the land on which such neighbours rested. Moreover, the squalid neighbours themselves already possessing powers acquired by similar prescriptive rights, were likely to be in skilful hands fertile of obstruction to individual improvement and public embellishment. He admitted that the Metropolitan Board of Works were in a position of unexampled difficulty, that the method of improvement was dictated by financial necessities; but he feared that, however much public opinion might be educated and broadened, there would still be found wanting in metropolitan administration that initiative faculty, that directing power which would see, suggest, and plan the needed improvement. Turning to a new topic, the President said the Council of the Institute had taken steps to improve the character of the examination for certificates of competency to hold the office of district surveyor. Instead of one sitting of four hours for the written examination there were now two sittings of three hours each, and in the latter of these the candidate's skill in making working drawings would be tested. An oral examination remained as before. They had also, after consultation with the Metropolitan Board, determined to impose a fee on each candidate for examination—a rule which would take effect at the beginning of next year. He had asked himself whether the usefulness of the library might not be extended by throwing it open to all *bonâ fide* students of architecture, and he had great satisfaction in announcing that steps had been taken to open the library free to young men who were engaged in the study or even practice of architecture, and who produced satisfactory evidence of the fact. Their late friend Thomas Henry Wyatt had bequeathed a legacy of £100 to the library, and he had been informed by Professor Donaldson that it was the intention of the Misses Jones, sisters of the late Owen Jones, to bequeath to the Institute such a sum of money as would found a studentship of the value of £50 per annum, to be tenable for two years, for the purpose of assisting meritorious students to travel, in order to advance their knowledge of architecture and of colour applied to architecture. They would, consequently, one day possess an Owen Jones Studentship—one that would probably be not less popular among students than the medals and prizes we annually offer in connection with the names of Soane, Pugin, Tite, Asphitel, and others. In conclusion, the President said:—It does not come within the powers of the Council to do all that many well-intentioned practitioners think ought to be done. I have heard it seriously maintained that the only use of the Institute of Architects is to enforce observance of a uniform tariff of 5 per cent. commission to be charged by old and young, experienced and inexperienced, capable and incapable practitioners of architecture; and that nothing short of expulsion under the by-laws should await the youthful or diffident practitioner who places upon the value of his professional services a lower figure than that charged by his elder or more fortunate brethren. I cannot conceive anything more illogical or more suicidal. The clauses in the Institute paper, entitled the "Professional Practice and Charges of Architects" represent simply the custom of the profession in Great Britain and Ireland, in India and the British Colonies. Where doubts crop up as to the amount of charges due, where no previous agreement has been made and disputes occur, where death intervenes, when a court of law asks for information as to the custom of the profession—then the paper of Professional Practice and Charges is rightly and necessarily cited. But no man in signing the declaration of a Fellow or an Associate of the Institute, and in accepting the terms of our charter and bye-laws, incurs the obligation to abide by any restraints of professional charges. All such commercial and professional restraints are opposed in more ways than one to the laws of the realm; and would, at the best, encourage action on our part not dissimilar of its kind to that of ill-advised trade-unionists. I admit that there are questions of professional practice requiring a great deal of thoughtful consideration—questions which may very fitly be discussed this session—particularly the complications connected with the taking-out of quantities, and the best means of obtaining a fairer adjudication in architectural competitions than appears to exist. These are matters that should occupy the serious attention of the conference to be convened in May next, when I trust that a large number of those architects who signed the memorial on competitions will do us the favour to be present. I also hope that the numerous quantity surveyors now practising in London and some provincial cities will afford us assistance in the discussion of several important points which are likely to be raised on the subject of quantities: the division of labour connected with them and the present mode of paying for them. Perhaps nothing about this memorial on competitions afforded me more astonishment than the fact that there are in the United Kingdom more than 1,300 professional architects, for at the present moment the Fellows and Associates of the Institute, together, only reach a total of 716. Indeed, at the close of the last session the numbers stood thus:—

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* Holidays in Home Counties. By EDWARD WALFORD, M.A. London: David Bogue, 3, St. Martin's-place.

	F.	A.		F.	A.
Australia	4	2	Ireland	6	3
Colonies and abroad	4	12	London and suburbs ..	209	253
English counties	110	82	Scotland	15	4
Indian Empire	3	3	Wales	0	6

351 Fellows, 365 Associates, making a total of 716.

But I am still more astonished to find that there are in this island nearly 3,000 persons professing to be engaged in the practice under some form or other of architecture. Now

I know of course that a vast number of the gentlemen whose names are put down in directories as architects, and who are so called by their neighbours, could not and ought not to become members of our body. But when you consider that of the many memorialists on the subject of competitions less than a third are members of the Institute, the very pertinent question arises: For what reason do these practitioners stand aloof from the corporate body of the profession? Are they unable or do they fear to incur the obligations which we have accepted? Some no doubt are prevented from entering our ranks by the expense, slight as it is of so doing; a few others perhaps by caprice. But that the majority are ostracised in consequence of conscientious reasons, I cannot for one moment suppose; nor do I think that there is anything in the declaration of a fellow or of an associate, or anything in our charter and by-laws, which an honourable practitioner, having at heart the good of his profession and of himself, ought to refuse to accept. Indeed it is only due to the public as well as to ourselves to direct serious attention to the fact that the number of architectural practitioners who submit to no recognised professional discipline—who take no obligation designed to secure integrity of practice, and eliminate all pecuniary interest in building materials or participation in the commerce of building—is legion. It is only due to myself as your president to state that the published names of such practitioners in this island alone exceed by much more than 2,000 those on the roll of the corporate body. I shall doubtless be reminded that those of them who are members of local societies do accept obligations and do combine to resist evils and abuses which, at the very formation of the Institute, it was the object of our founders to root out, and which they largely succeeeded in abolishing. But I need no such reminder. I am aware that the constitution of two or three of the provincial institutes and associations does not seriously differ from the purport of our own; but are such societies endowed with the powers which the corporate body of British architects possesses? I doubt it. I venture to maintain that the interests of the public not less than of the honourable practitioner of architecture are linked with the prosperity and influence of the Royal Institute of British Architects; such interests are linked with the legitimate control the Institute exercises over the conduct of those who accept the systematic discipline it is authorised to impose.

Mr. **Charles Barry** proposed a vote of thanks to the President for his practical and eminently business-like address, one which would, he believed, prove useful to members personally, professionally, and socially. Amongst the many questions on which the President had touched, a number of experiments by which it was hoped the working of the Institute would be improved and its usefulness facilitated, the most important of these changes was the compulsory examination; and while the speaker hoped it would prove useful, members must not be unprepared for partial success or ill-success. The proposal to reduce the number of papers read during the session might possibly be an engine of great good, but it was also capable of effecting much mischief. It was to be hoped that at the meetings for the discussion of professional business, questions necessarily personal in character would be discussed with the calmness necessary in approaching such subjects, and that there would be shown the willingness to co-operate required to give the Institute the influence all desired. He thought the customs had so changed, and education had so advanced since Rondelet wrote, that, were he living now, he would not charge architects with studying art in preference to science. With reference to the metropolitan improvements, what London needed to effect comprehensive improvements was an arbitrary ruler of the Haussmann type. In the allusions to professional remuneration, he could not agree with the President that members might reduce their charges below the scale of the published instructions: the 5 per cent. was little enough, and if this were departed from the public would play off one architect against another, and beat them down to 4½, 4, or even 3½ per cent., and induce amongst architects a spirit of rivalry in charges which was most tremendously to be deplored.

Mr. C. L. **Eastlake** seconded the vote of thanks, which was carried by acclamation.

The election of an honorary secretary, in the stead of the late Mr. T. H. Wyatt, then took place, when Mr. John Macvicar Anderson, who has been performing the duties *pro. tem.*, was unanimously chosen.

LEEDS ARCHITECTURAL SOCIETY.

THE first meeting of the fifth session of the Leeds Architectural Society was held at their Rooms, in the Leeds Mechanics' Institution, last week, Mr. Henry Walker, F.R.I.B.A., presided. The report regreted the retirement of the late President, Mr. A. Crawford, and stated that the result of the competitions for the prizes offered was as follows:—Set of measured drawings: Silver medal, Mr. A. Gaunt; extra book prize, Mr. F. Raney. Design for town church: First prize, Mr. A. Whitehead; second prize, Mr. Joseph Hall. For one of the prizes the work submitted was not considered to be of sufficient merit to warrant the prize being given. At the meeting for the election of officers ,Mr. H. Walker had been elected President; Mr. T. Ambler and Mr. S. E. Smith, Vice-Presidents. The President, in his opening address, speaking of the question of quantities, he referred to a recent paper read before the builders of Bristol, and a reply to the same from a Liverpool gentleman. Mr. Walter described quantities as a complete list of items representing the various materials and labour needed in the proposed building. They are arranged under headings of the different trades in the form of a bill, having £ s. d. columns, in which the person tendering inserts a price opposite each item, and these when totalled represent the amount of his tender. He laid great stress on quantities being taken out accurately to represent the finished work, and the practice of independent surveyors taking them out full, in order to cover the risk of any accidental omission, for which they are usually made responsible, he condemned, and suggested as the only remedy for the present system—that a clause should be inserted in the conditions, to the effect that the quantities would form part of the contract, as well as the prices attached thereto, by the person whose tender was acepted; also that any omission, discrepancy, or other error found in the drawings, specification, or quantities, shall be allowed for either way on the basis of the contractor's tender and price list if discovered before the settlement of the accounts, and that deviations from the original design made during the progress of the works should be similarly dealt with. Mr. Walker thought that if this course were generally adopted disputes and costly arbitrations would be rare, while it would matter little to the client or builder whether the architect or quantity surveyor took out the quantities, so long as the work was properly done. He condemned unmercifully those who accepted illicit commission, and referred to a case which cropped up about two years ago at the Leeds Assizes, saying that such persons might well afford to take work so much below the usual professional charges to the disadvantage of the more honest and hard-working members of the profession. He next passed on to the question of competitions, and, after complimenting Mr. Thomas Porter, F.R.I.B.A., for the thorough way he had brought the subject before the R.I.B.A., said the recent memorial presented by Mr. Street, R.A., to that body on behalf of no less than 1,270 practising architects, praying that Institute to take the subject into its serious consideration, was the outcome of Mr. Porter's endeavours. Mr. Walker quoted letters sent to Mr. Porter, giving their experiences of the present hateful system, which is wasteful to the profession, besides being the cause of much jealousy and many and bitter disappointments. The public view of competitions he thought due to young and zealous architects being eager to run before they were able to walk; also the want of consent, mutual sympathy, and common aims amongst architects themselves. Under the present system competitions have become but a lottery, into which the most ignorant may cast his designs, and Mr. Walker gave reasons for thinking that not so good designs are got by this means as would be produced if the same architect were employed in the usual way. Committees were often very unreasonable in asking for needless drawings, having no weight in deciding a competition. He referred to the competitions for Manchester Town Hall, Over Darwen Town Hall and Markets, Leeds and Glasgow Municipal Offices, and Truro Cathedral, and one for some villas at Peterborough, as examples of the different ways architects get treated. Speaking of the Leeds competition, he said the Council, for some reason best known to themselves, included no less than three in the eight selected designs out of which the referee was to select those for the prizes, that could not, without a stretch of imagination, be classed even as possible, while it was rumoured at the time that one of the designs which eventually had the prize awarded to it was left out of this number, but smuggled in afterwards, while many excellent designs were left out in the cold. The referee being an upright man, must have seen the injustice being done, and might well regret that the whole of the designs submitted were not allowed him to choose from. Had this been done a very different award would have been the result. This case went to prove that however fair the conditions of a competition are drawn up, things go wrong when a committee are more interested in giving their friends a lift than in the honour of their town, or of securing the best and fittest design for execution. To get over the present difficulty arising from the want of confidence in a professional referee, Mr. Walker suggested how the competitors themselves could be allowed to decide by vote. Many abuses of the competition system were attacked, while improvements were recommended. The people of Manchester showed good sense and consideration for their townsmen by limiting the competition for the proposed Board schools to architects practising in Manchester. Mr. Walker said this reminded him that there was not apparently an architect in Leeds, or indeed Yorkshire, fit to be entrusted with the designing of the Yorkshire College, and the same might be said of other buildings in Leeds. Yet he had seen nothing in any of them that could not be produced by our own townsmen. So long as there is an architect practising in the town of good repute it is only fair he should be employed, unless it could be shown that a better design or something could be saved by going elsewhere. The deplorable state of Kirkstall Abbey was next referred to Mr. Walker stating that unless prompt measures are taken for its protection it will in a few years become little better than a heap of stones. Points in connection with the restoration of Adel Church were taken exception to, Mr. Walker complaining that the nave of the church had been robbed of its parapet and the east window removed, both of which preceedings he thought Mr. Street would have been one of the first to object to, had the work been in other hands but his own. The effect was that the church now wanted the dignity the parapet gave it.

CHIPS.

New refractory-wards are about to be built at the Shoreditch workhouse, from the plans of Messrs. Lee and Smith, architects to the Shoreditch Board of Guardians.

The memorial-stone of a new town-hall and market-place was laid at Maesteg on Saturday afternoon. The edifice will be built of local Pennant stone, with dressings of terra-cotta, and the style is Queen Anne. A bell-turret forms the chief feature of the east front. The ground-floor is arranged as a covered market, 70ft. by 45ft., and local board offices; and on the principal floor is a town-hall, 86ft. by 45ft., and to be seated for 1,200 people. Mr. H. C. Harris, of Cardiff, is the architect; Mr. George Thomas, of Pembroke Dock, is the contractor; and the terra-cotta ornamentation is being manufactured by Messrs. Doel and Co., of Bridgend. The cost will be over £4,000.

The Durham rural sanitary authority have adopted plans, prepared by Mr. Greigson, their surveyor, for the sewering of the district of Sunderland-bridge, and the disposal of the sewage on a site of three acres of land, to be acquired under compulsory powers.

On Monday night the second session of the Ruskin Society of Glasgow (the Society of the Rose) was opened with an address by Mr. John Morrison, the president, in the Accountants' Hall. He said it was not their desire to fall into mere Ruskinism, but there were special reasons for the existence of that society, such as the fact that Ruskin was greatly misunderstood, and also the nature and importance of the multifarious works which he had given to the world. During the present session the society would make a study of "The Seven Lamps of Architecture," which, as Ruskin had himself said, contained the germs of all he had subsequently written.

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OUR LITHOGRAPHIC ILLUSTRATIONS.

NEW PREMISES FOR MESSRS. COPE BROTHERS AND CO., LIVERPOOL.

The tobacco factory of Messrs. Cope Brothers & Co. is situated on a site north of, and immediately adjoining, the terminus of the London and North Western Railway. A visit to the manufactory has long been one of the sights of Liverpool, and some idea of its size and importance may be formed when it is stated that the premises occupy the whole of the land between the railway station and Lord Nelson-street to the north, and Saint Vincent-street to the East. The different workrooms are all spacious, and well warmed and ventilated, and for the comfort and convenience of the two thousand people employed, dining-rooms are provided, fitted up with all necessary cooking utensils. The portion of the buildings shown in our illustration is in Saint Vincent-street, the side elevation looking on to the platform of the station, which is on a much lower level. The main block contains the time-office, workmen's entrance, store-rooms, keeper's house, &c. The gateway is the general entrance to the works for goods, &c. The walls are built of local grey bricks, red Ruabon bricks being used for the windows, strings, &c., the roofs are covered with red tiles, and all the windows are glazed with plain lead lights. The works have been carried out by the firm themselves, with their own workmen, from the plans and under the superintendence of Mr. John Douglas, of Chester.

HOUSE, BRANKSOME PARK ESTATE, BOURNEMOUTH.

This house stands on an eminence overlooking the sea, and occupies some 5 acres of land covered with pines and Scotch firs. The exterior is executed in yellow stocks with special red dressings, the chimneys also being in red bricks. The gables are constructed of solid half-timber work, and the roof covered with Broseley tiles. The windows are arranged to produce the effect of casements, with the convenience of the ordinary sash and frame, the transom being made use of for the purpose of ventilation. The interior has been carried out in character with the exterior, the woodwork in entertaining rooms, hall, staircase, mantels, &c., being executed in pitch-pine from special designs. The drawing-room averages 24ft. by 19ft. dining-room 22ft. by 19ft., morning-room 19ft. by 17ft., kitchen 16ft. square, and servants hall 15ft. by 10ft. The kitchen and offices are all on the ground-floor. Every care has been taken with the sanitary arrangements and ventilation. The whole has been executed by day-work and piece-work, all materials being supplied by the owner. Mr. Faggetter has acted as clerk of works under the superintendence of the architect, Mr. J. Nixon Horsfield, 40, Knightrider-street, E.C.

HOUSE AT BOURNEMOUTH.

It is proposed to build this house on about two acres of land. It will be carried out in the same way, and with similar materials as the above. The balcony is so arranged as to get a view of the sea, the space behind being used as a smoke-room.

FURNITURE BY E. W. GODWIN, F.S.A.

A Gothic piece of furniture is rather an unusual subject just now for illustration, and so the drawing-room centre table, which we publish to-day, from the designs of Mr. Edward W. Godwin, F.S.A., has an air of freshness about it, while the pedimented Queen Anne "overdoor" accords rather more with the present taste in furniture matters. Both the above are made by Mr. Wm. Watt, of Grafton-street, W.C.

CRICKET AND ARCHERY PAVILION, BEDDINGTON PARK.

This private pavilion, erected at a cost of over £3,000, stands in an enclosure of several acres in the midst of Beddington Park. It comprises, besides the covered verandah with raised seats in front, and railed round—a large dining hall with the proper culinary requirements at the rear, pantries, ice-well, &c. The ladies and gentlemen's dressing rooms, with lavatories, and water laid on, are on the ground floor, and with the dining hall are pannelled and ceiled in pitch pine; there are ranges of lockers, hanging-closets, and every requirement for comfort and use. The furniture of the hall and throughout is solid and in character. The towers comprise smoking and store rooms, with large tanks supplied by force pumps for the purpose of watering by hose the cricket ground. There are beautiful views from these towers, over the park, with the river Wandle running through, and the surrounding country. There is a range of offices with convenient sheds for carriages and horses, besides arrangements for servants at the back of the pavilion. The building is constructed on a brick foundation with concrete under, having stone quoins, and the chimneys also in red brick, with solid timber framing filled in, combined with oak rustic work to the open verandah and elsewhere; the floors are planked; the roofs are covered with Norfolk-reed. Everything has been carried out in the most substantial manner from the designs of Mr. Joseph Clarke, F.S.A., 13, Stratford-place. The builders were Messrs. Roberts, of Islington; the clerk of works being the late Mr. Thos. Booth. The whole of the extensive ground is enclosed by oak park-paling. A lesser pavilion has also been erected from the designs of the same architect in a separate, but adjoining cricket ground in the park, for the village and other local clubs, having the usual arrangements, dressing rooms, offices, &c.

ST. GILLES, CAEN.

This small church, under the shadow of the Abbaye aux Dames, will be so well known to most of your readers that little description will be necessary. With so many others of the smaller churches of Normandy, and especially of Caen, it is now only used for lumber, being, however, more happy than most of its brethren in that it is lumber ecclesiastical, and not lumber equestrian, &c. This has saved it from the damage caused by the constant presence of careless workmen. Some years ago, the church narrowly escaped being wholly swept away, and this undoubtedly would have been its fate had not its uses as a store-house for the furniture of the Abbaye ceremonials, &c., justified its remaining, in the eyes of those in authority, for a few years longer. The choir was unfortunately at this time, or somewhat earlier, taken down for so-called "street improvements." The perfect preservation of the remaining portions is very striking, and the beauty of its proportion, combined with its extreme simplicity, points it out as a model of what a small country church should be. The nave pillars and arches, as will be seen from the drawings, being so unusually low, allowing ample space for a triforium arcade, give the interior this air of simplicity and solidity, which is so very striking, and unrivalled in my experience by any church of a similar character. The tower, and exceptionally fine treatment of the south door, were, I noticed, illustrated by you on September 17th last.—W. H. Wooler.

ST. PAUL'S ECCLESIOLOGICAL SOCIETY.

The new session of this society was opened last (Thursday) night, by a general meeting, held at the Chapter House, St. Paul's Chuchyard. A paper on "Old St. Paul's" had been written by the Rev. Mackenzie E. C. Walcott, B.D., F.S.A., precentor of Chichester, but owing to his absence through serious illness, it was read by Canon Shuttleworth, Chairman of Council. The paper, which we publish on page 523, was illustrated by two original plans of the cathedrals, one a ground plan of the two buildings, showing the alterations in axes of the older one, ascertained by Mr. F. C. Penrose, the cathedral surveyor, two years since; the other a larger plan of Old St. Paul's, exhibiting the several shrines and chapels. We published a series of views, plans, and elevations of the old and new cathedrals on July 25, and Aug. 6, 1873.

The following is the Society's programme for the ensuing session, it being announced that the dates after Christmas are only approximate. The meetings are held on Thursday evenings, commencing at 7.30, at the Chapter House, St. Paul's.

November 18th, paper on "Ecclesiastical Colours," by the Rev. J. B. Powell, M.A.
December 9th, the Annual Conversazione, in the Galleries of the Society of British Artists, Suffolk-street, Pall Mall. Music by Gentlemen of the St. Paul's Cathedral Choir.
January 13th, "Ecclesiastical Heraldry," by Mr. Stephen Tucker, Somerset Herald.
January 29th, Annual General Meeting.
February 3rd, First Annual Dinner.
February 17th, "The Cathedrals of St. Peter and St. Paul Compared," by Mr. Somers Clarke, jun., M.R.I.B.A.
March 3rd, "Suggestions for the Fabric of the Church in the Present day," by Mr. Edmund B. Ferrey, F.R.I.B A.
March 17th, "Altar Furniture and Decorations in Western Europe," by Major Alfred Heales, F.S.A.
March 31st, "Baal worship and Baalitic practices connected with modern times," by the Rev. S. M. Mayhew, M.A.
Other papers and visits will follow.

CHIPS.

Mr. Hugh Smith, C.E., of Southport, has been unanimously appointed engineer and surveyor to the local board of Great Crosby, near Liverpool, at a salary of £200 per annum. There were, we understand, 176 candidates.

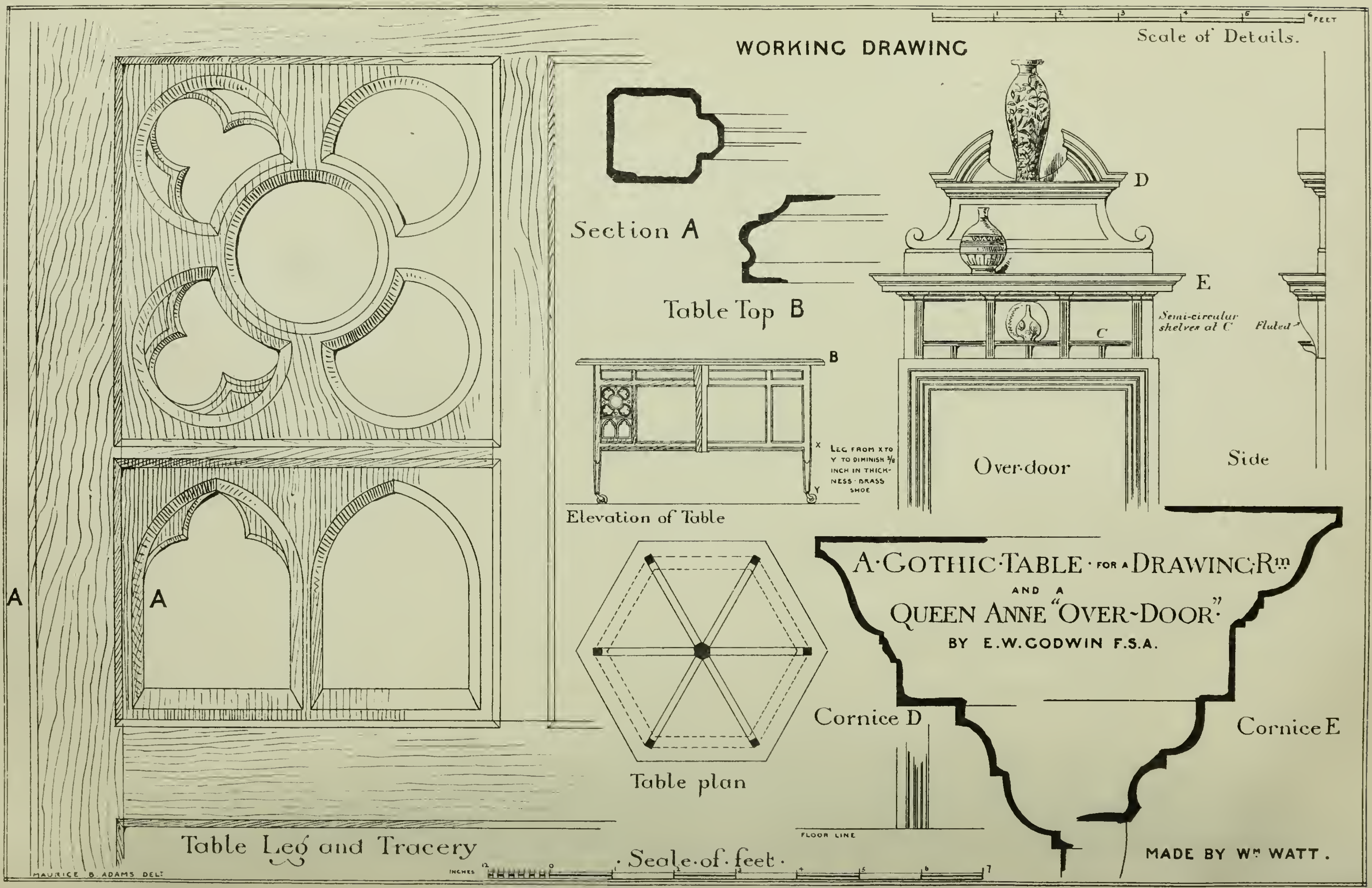
New sewage-disposal works at Birkdale, carried out upon Hillé's system of chemical treatment and filtration through five beds used in rotation, were opened last week. The works cover nearly five acres of land.

A memorial reredos was unveiled in the collegiate church of St. Peter, Coggeshall, on Monday week. It is of alabaster, with figures of Caen stone. It consists of an arcade of three large and four smaller openings arranged alternately. In the centre is carved the Crucifixion, with SS. Mary, John, and Mary Magdalen, and on either side, in a small niche, a statuette of an archangel. On the north side is represented Abraham offering up Isaac; on the south, the Israelites at the First Passover in Egypt, and outside either, a second statuette of an archangel. Mr. Christian designed the memorial, the carving was executed by Mr. Forsyth, and the total cost was about £300.

New auxiliary buildings are being added to the General Hospital, Birmingham, on an adjoining piece of land. They include a nurses' home for 100 nurses, two detached wards of 14 beds each for cases of burning, and at the further end of grounds a mortuary. Mr. Yeoville Thomason is the architect, and Messrs. Jeffrey and Son are the builders; the cost will be about £10,000.

It had been proposed to erect a second county lunatic-asylum for Essex at Wickham Bishops, near Witham, and land had been purchased for that purpose, but no water can be obtained on the site, although £7,000 had been expended upon boring operations, and at the Essex Quarter Sessions last week, the asylum committee were instructed to have plans prepared for a new block of buildings on the present asylum grounds at Warley, near Breutwood.

A short paragraph on p. 518, respecting the rebuilding of Deptford Bridge is, we are informed, not quite correct. The *County of Kent* is making the improvements, the Metropolitan Board of Works is widening the road through the district, and the county is rebuilding the bridge under the superintendence of Mr. F. W. Ruck, the county surveyor. The contractors are Messrs. Ball and Gammon, of London and Gilliugham, not *Gammon and Co.* We printed a list of tenders for the work a few weeks back.



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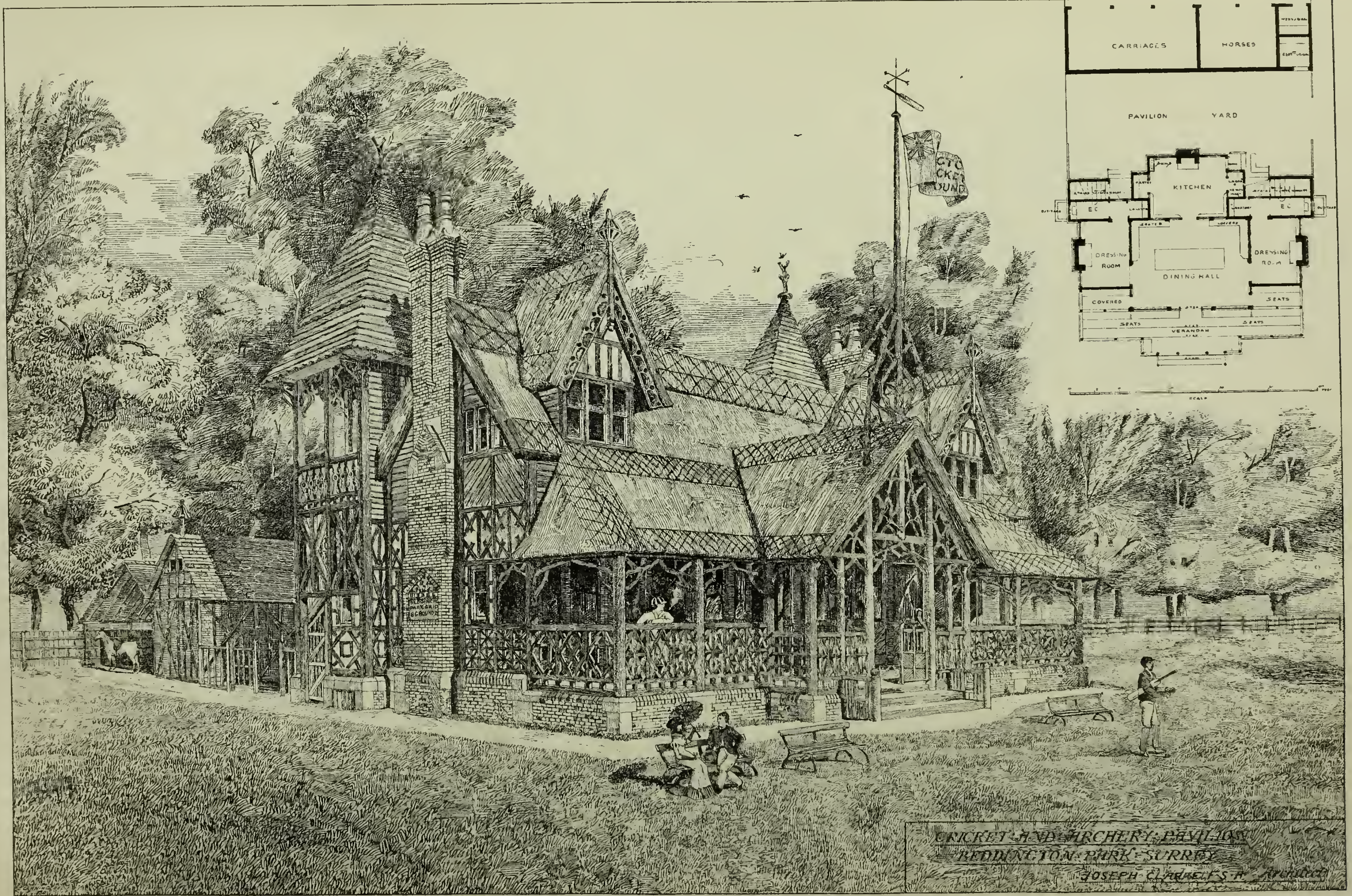
THE BUILDING NEWS, NOV. 5. 1880.



CRICKET AND ARCHERY PAVILION
BEDDINGTON PARK SURREY
JOSEPH CLARKE F.S.A. Architect

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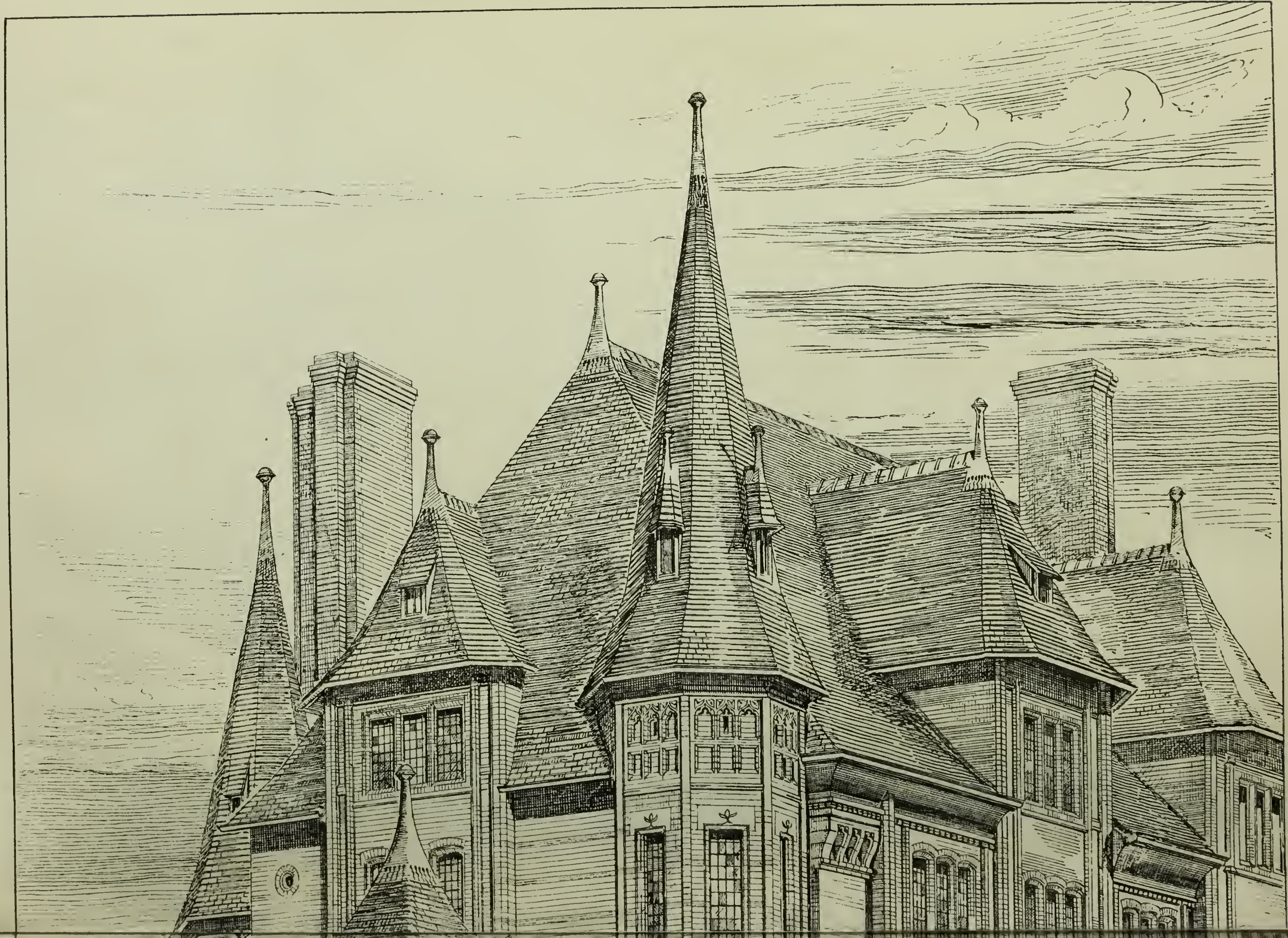

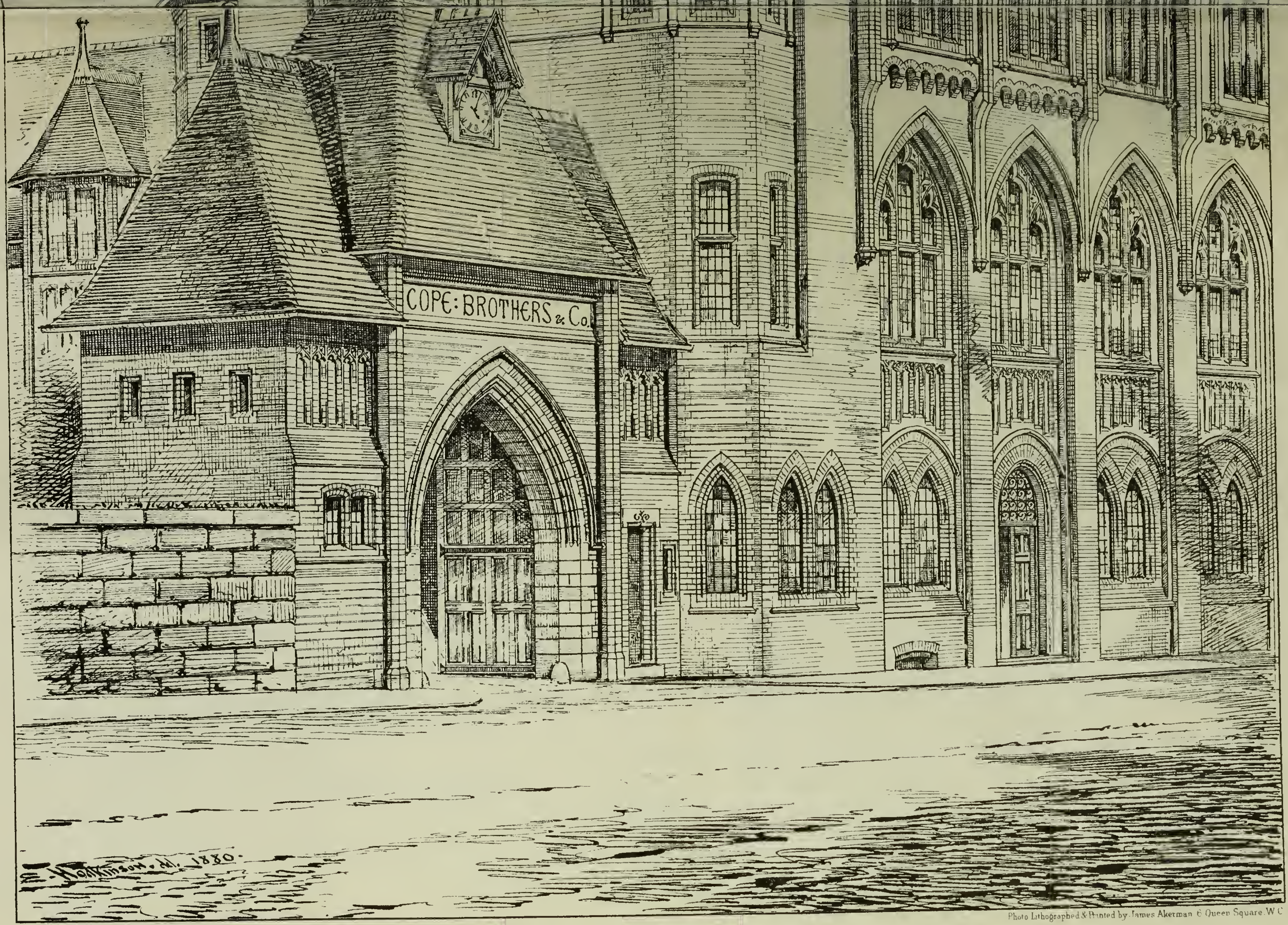

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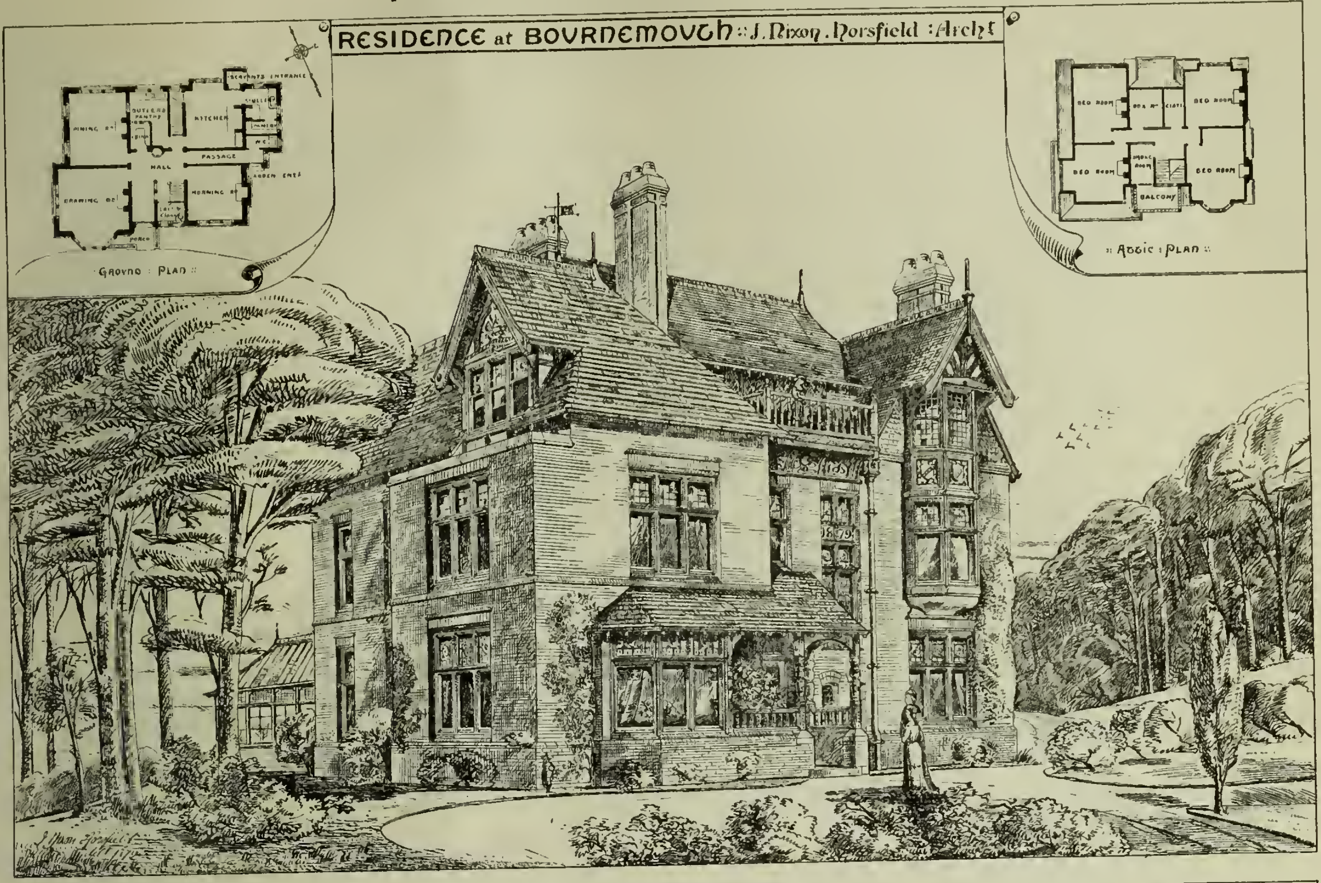
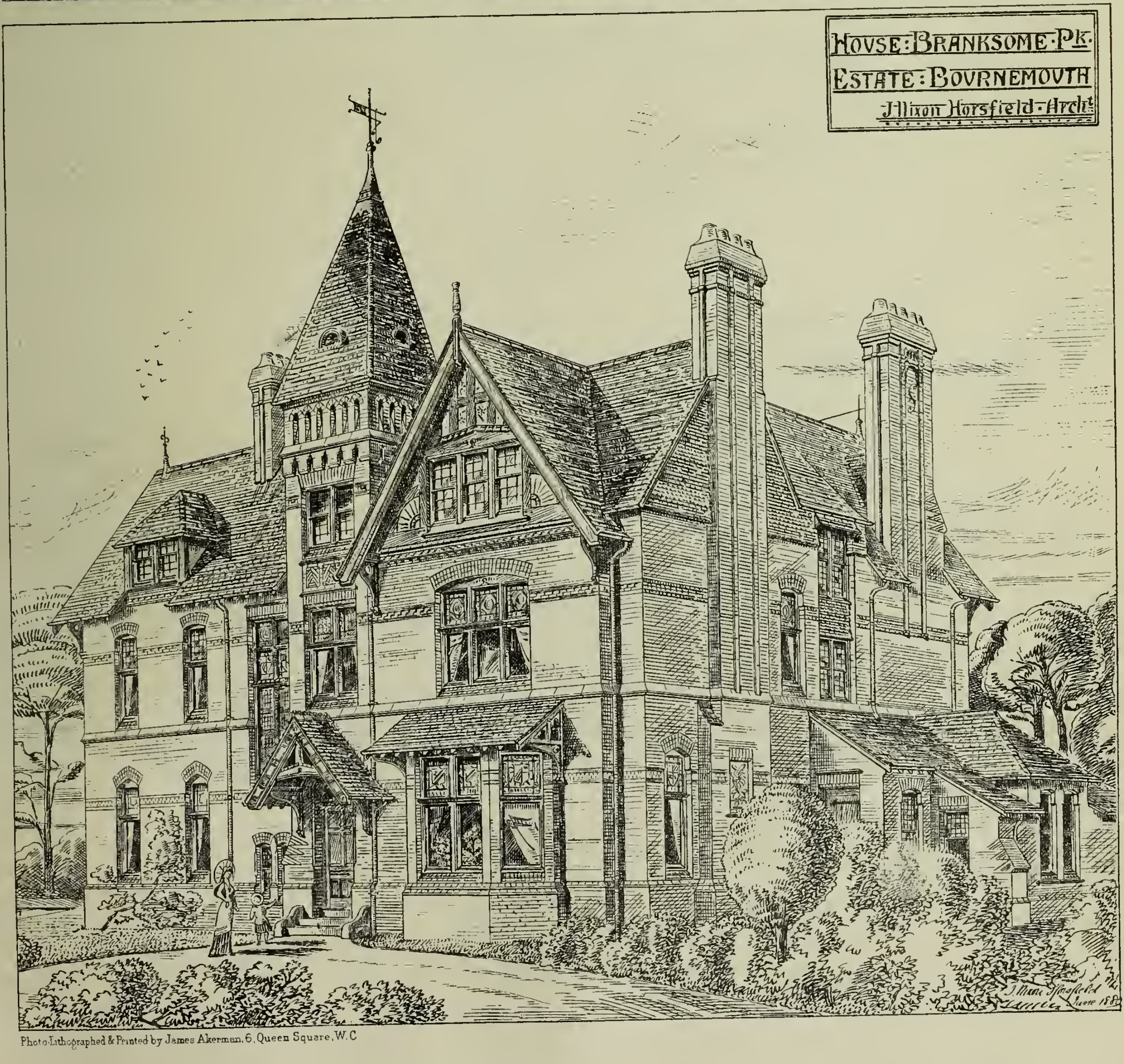
PART OF PREMISES S. VINCENT STREET AND LORD NELSON STREET LIVERPOOL. MESS^RS COPE BROS AND Co.
JOHN DOUGLAS, ARCHITECT.

RESIDENCE at BOURNEMOUTH :: J. Nixon Horsfield : Archt.



HOUSE : BRANKSOME · Pk. ESTATE : BOURNEMOUTH

J. Nixon Horsfield · Archt.



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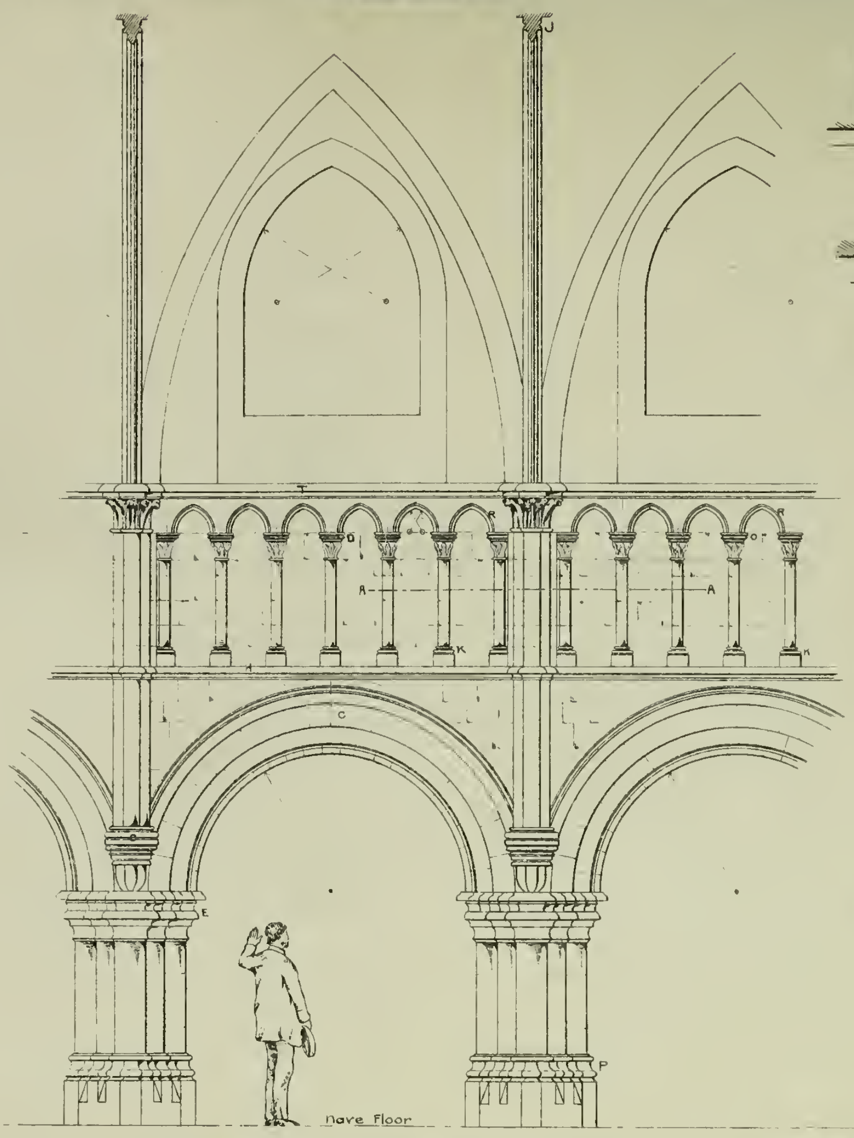
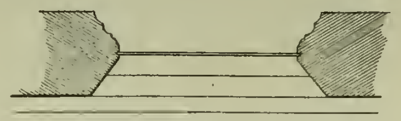
St. Gilles, Caen.

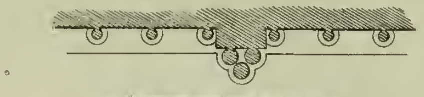
Interior Elevation of South Side of Nave



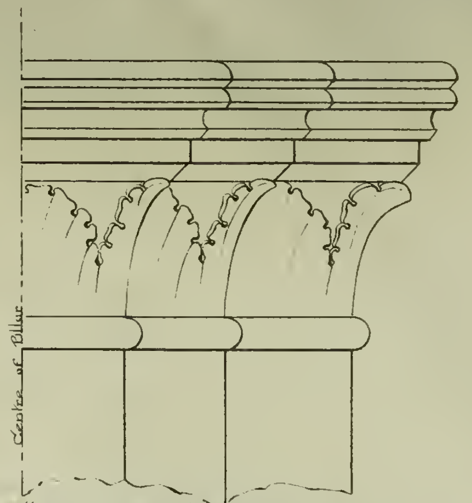
Interior Compartment South Side of Nave



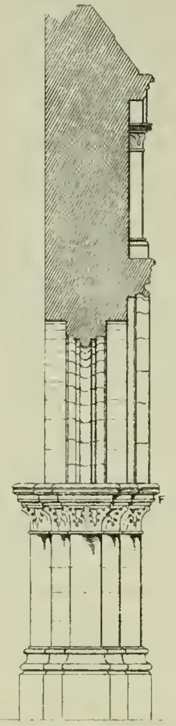
Plan of Clerestory Windows



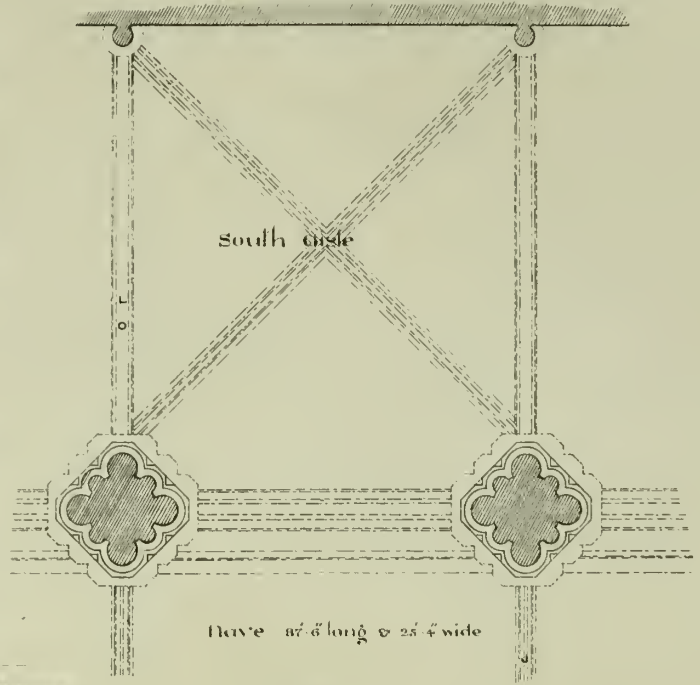
Plan of Blind Storey A.A



Pillar Caps North Side of Nave ¼ FULL SIZE



Section, North Side of Nave



Nave 87′·6″ long & 25′·4″ wide

Plan

July & Nov. 1876.

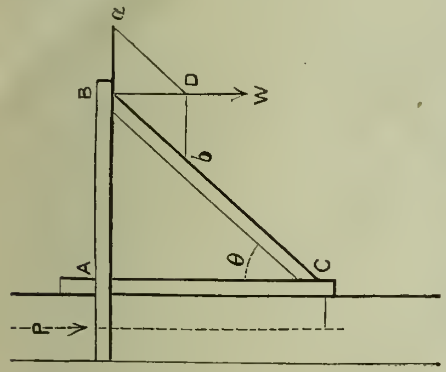
Measured and Drawn by W. H. Wooler.

Photo Lithographed & Printed by James Akerman. 6. Queen Square W.C.

THE MECHANICS OF BRACKETS.

THERE are few features more common in every style of architecture than the projecting of certain of the upper portions of a building beyond the face of the main wall, as in balconies, oriels, cornices, &c., which are supported by means of brackets, cantilevers, consoles, or corbels. The mechanical principles involved in these different methods of carrying a load beyond the face of the supporting wall are very nearly alike in character and mode of action, the resistance offered to the strains differing only in degree according to the nature of the materials employed.

Let us suppose a bracket consisting of three pieces of timber framed together in the form of the right-angled triangle A, B, C, to be fixed against the face A C of the wall, through which the bearer, A *B*, penetrates to the back. The sloping piece, B C, or strut, supports the outer end B of the bearer to which the weight W is suspended. If the strut B C were removed, the load W would cause the bearer A B to bend downwards, and tend to break it short off at A, provided it was firmly fixed in the wall and held down by the weight (P) of the wall above it. It is evident, however, that the bearer will be able to carry a certain amount of load, say *w*, at B, without any sensible bending being produced in it; if, then, the total load W at B is equal to $w + W^1$, the strut B C will only be affected by the portion W^1, the weight *w* being counteracted by the strength of the bearer itself. We may, therefore, consider the load W which strains the bracket at B, as being the effective load, or the actual load less the amount *w*.



To find the relative strains on the bearer and strut, take the length B D to represent on any scale the effective weight W; then, by drawing the parallelogram *a b*, we have B *a* representing on the same scale the horizontal tensile strain in B A, and B *b* the compressive force produced down the strut B C. We have, then, by resolution of forces,

$$\text{tension in B A} : W :: B\,a : B\,D,$$

$$\text{or, tension in B A} = W \frac{B\,A}{A\,C} = W, \tan.\ \theta$$

θ being the angle A C B which the strut makes with the vertical. Also,

$$\text{compression down B C} : W :: B\,b : B\,D$$

$$\text{or, compression in B C} = W \frac{B\,C}{A\,C} = \frac{W}{\text{Cos. } \theta}$$

The bearer being supposed to be firmly fixed in the wall at A, the tensile strain W tan. θ, to which it is subjected, must be provided for in the scantling of the beam. Let *b d* be the area of section in inches, T the tensile strength per square inch of the material; then we must have

$$T\,b\,d > W.\ \tan.\ \theta$$

$$\text{or, } b\,d > W \frac{\tan.\ \theta}{T}$$

which determines the sectional area of the bearer A B.

If the load W is distributed equally along the bearer, as is most generally the case in buildings, the strain at B which it produces will only be half what it is when all collected at that point, but the bearer itself must be made stronger in order to be able to support the load without bending, according to the formula for a beam supported at both ends, namely,

$$W = S.\ \frac{b\,d^2}{l}$$

where *b*, *d*, and *l* are its breadth, depth, and length, and S is a constant depending on the nature of the material. The compression down the strut will, in this case, be only half the load

$$\frac{W}{\text{Cos. } \theta}$$

When the load acts at the point B, the compression in the strut B C has been shown above to be represented by the quantity $\frac{W}{\text{Cos. } \theta}$ which is evidently diminished by increase of cost or by the decrease of the angle θ, which the strut makes with the vertical, or by moving the point C lower down the face of the wall, being least when θ = 0, or the strut is vertical, in which case, $\frac{W}{\text{Cos. } \theta} = W$, and increasing towards infinity as C approaches A, or the angle θ approaches a right angle. The resistance to compression in a strut of wood "die-square" varies directly as the fourth power of the diameter, and inversely as the square of the length, so that we must have the relation

$$\frac{W}{\text{Cos. } \theta} < K \frac{d^4}{l^2}$$

where K is a constant depending on the nature of the material; from which the scantling (*d*) of the strut can be determinined for any given length (*l*), for we have

$$d^4 > \frac{W}{\text{Cos. } \theta} \frac{l^2}{K}$$

There is another important point which is too often overlooked in corbelling out the upper portions of a building, namely, the tendency of the end of the bearer at A where it enters the wall to lift up the portion of the wall above it by the load at B, turning the bracket about the lower point C, this tendency being represented by the moment of W about C, or W by A B. In order to counteract this moment, we must have a great moment of the weight of the wall (P) above the point A, taken about the same point C. If, then, we call *t* the half-thickness of the wall at C, in order to have stability in the bracket, it will be necessary to have

$$P.\ t > W.\ AB,$$

$$\text{or } P > W \frac{A\,B}{t}$$

which determines the minimum weight of wall that will be required above the point A. In the case of heavy cornices placed near the top of a wall which is corbelled out, this condition is seldom fulfilled, and, consequently, other methods have to be resorted to of securing the projecting structure, such as tying through the wall, and holding down by iron cramps to a lower portion of the wall, so as to get a greater hold upon it, all of which methods are unscientific in principle and often result in the wall being pulled over by the overhanging structure.

In cases where the bracket or corbel is made of solid material, as brick, terra-cotta, or stone, and is built its entire depth A C into the wall, there will be a strain caused by the leverage of W, tending to tear asunder the material along the line A C, where it enter the wall, the moment of which is W × A B, and the moment of resistance is $S \times A\,C^2$ for a unit of breadth, so that we must have for stability

$$W \times A\,B < S \times A\,C^2$$

where W is the load upon a unit of breadth of the corbel measured horizontally along the wall face, and S is the constant experimentally determined for the particular kind of material employed. A common example of this kind of structure is seen in stone staircases which have the ends of their steps built into a wall, and the outer ends unsupported; for the ordinary traffic of a staircase this method gives sufficent strength; but when the staircase of a public building becomes crowded with people, considerable danger of fracture arises, and fatal accidents have not been unfrequent in this kind of staircase; so that where the width is considerable, an iron string is generally fixed at the outer edge to give greater stability to the stairs.

ARCHITECTURAL ASSOCIATION.

THE 39th session of this Association was inaugurated on Friday evening by a *conversazione*, at the Architectural Union Co.'s premises, in Conduit-street, W. In the lower galleries the Exhibition of the Institute of Art was on view, so that the special loan-display was almost restricted to Mr. Robinson's sheets of architectural photographs from Norfolk and a few water-colour drawings. In the west gallery the band of the Royal Engineers performed a selection of music. The attendance of members and their lady friends was so numerous that the perambulation of the rooms became, as the evening advanced, a serious difficulty; but the refreshment and cloak-room' arrangements were better adapted to reduce the inconveniences of a crush than has been the case in previous years. The premiated drawings were hung on the walls of the Institute meeting-room, and at nine o'clock this was filled to overflowing. The President for the new session, Mr. E. C. Lee, occupied the chair, and opened the proceedings by reading a letter from Mr. Decimus Burton, one of the few survivors of the founders of the Institute, who regretted his inability, through age and infirmity, to be present, and inclosed a cheque for ten guineas, to be added to the prize-fund. Mr. Lee then distributed the prizes, announcing that, as only one essay had been received, and that of insufficient merit to justify the award of a prize, the Essay Prize would be withheld. For the Architectural Union Co.'s prize, the drawings under the motto "Gipsy" were placed first, subject to the settlemenent of the question whether it could be given to them, they having been submitted on some other occasion; the second prize, value £2 10s., fell to "Lincolnshire," Mr. J. L. Houston. The Architectural Association's silver medal and £5 were awarded to "Detur Digniori," Mr. E. M. B. Vaughan. In the Class of Design, Mr. M. J. Lansdell took the first, and Mr. R. J. Lovell the second prize, Mr. Burrows receiving honourable mention. In the Elementary Class of Design, Mr. Cecil H. Stock received the first, and Mr. G. Blizard the second prize, and Mr. C. C. Bradley honourable mention. In the Class of Construction, Mr. J. Shillcock was first, and Mr. Clifton second, Mr. Yetts obtaining honourable mention. In the Class of Colour Decoration, Mr. S. R. Smith gained the only prize. The

INAUGURAL ADDRESS

was then delivered by the President. He traced the history of the Association, commencing with the year 1842, when an attempt was made by some young men belonging to a registration society of architectural draughtsmen to give to it, in addition, an educational character, under the title of "The British Association of Architectural Draughtsmen." It was not till 1847 that the present name was adopted, and from that period they would be more correct in computing their sessional existence. Professor Kerr filled the chair for the first time, the meetings being held at Lyons-inn-hall, and amongst the names of early members and originators were found those of Collin, Deane, Edmeston, Fletcher, Garbett, Hayward, Nicholls, Cubitt-Nicholl, Nesfield, Randall, Rickman, Robins, Roger Smith, Seddon, Norman, Shaw, and Truefitt. It had many struggles for existence, and in 1856 Mr. Rickman had the hardihood to propose dissolution, a drastic proposal which awakened the association to some of its shortcomings. In 1853 a syllabus of papers was settled, and in the following year the rules were reconstructed to very nearly their present form, and the library was started. The first "Brown Book" was published in 1859, and enumerated 130 members, of whom but seven belonged to the Institute and one to the Society of Antiquaries. The number of members rose to 330 in 1866, to 670 in 1876, and at the present time exceeded 800. It had now been decided to endeavour to institute a yearly prize, worthy of its position as an educational body; a sub-committee was about to report on the question, and although the scheme had not been officially accepted, it was hoped that the new year would see it in course of execution. The proposal of the sub-committee was—1st. To raise £400 amongst past and present members of the Association to endow a travelling studentship named after the Association. To avoid apparent competition with other travelling studentships, the age of candidates would be fixed at 23, and design as well as draughtsmanship would be considered in the award. 2nd. To form a special prize fund committee to raise a fund for the increase of the value of the annual prizes. During its brief life, continued the President, the Architectural Association has seen the public made acquainted with the possibility of a Gothic revival, by the efforts of the late Pugin, Barry, Scott, Lamb, and Ferrey, the last of whom will long be remembered as much for his ever-ready kindness in word and deed to the rising generation of architects, as for the good work he did in promoting the cause of architectural art in this country. The public interest being aroused, now began to clamour for a new style, and many attempted to supply this demand with but indifferent success. The Strand Music Hall was one result. Victorian Gothic then became the cry, but it did not live to develope into a style. The Law Courts competition brought a more healthy atmosphere into the architectural firmament, and Mr. Burges' design was paraphrased all over the country with more or less accuracy and appreciation of feeling. Now waged the battle of the styles. The Classicists began to be alarmed, and took up arms. With the upholders of the new revival, they indulged in many a wordy combat, and the halls of Conduit-street oftentimes rang again with the mighty din of conflicting opinion. The Gothic array, though like the old Crusaders, showing a united front while facing the common foe, like them again suffered from schism. The self-installed disciples of Scott, Street, Burges, Shaw, Nesfield, Godwin, Butterfield, and Blomfield, and late prophets not without honour, added fuel to the flame of discussion in their enthusiastic support of each special champion. Many were the suggestions hazarded concerning that great Crux, the style of the future, and while we yet marvelled at Shaw and Nesfield's Lodge in the Royal Gardens of Kew, school boards sprung up like mushrooms all over London and broke the monotony of the sky-line in most unexpected places. Queen Anne began to hold sway. While we slumbered Cheyne-walk, Holland and Bedford Parks became painters' colonies, and studios developed into a special study. Houses of honest material but bucolic colour crowded into Kensington and defied the sumptuous stucco on its own ground. It is to the varied genius of our architects that we have to be grateful for making London a unique city. Nowhere else can such a complexity of style be found. Side by side we see the polychromatic grandeur of the new Natural History Museum and the retiring rusticity of Lowther Lodge. The Modern Colosseum of the Albert Hall acts as a foil to the Gothic Memorial of the Prince Consort. Down a by-street, and pinned in by a row of stucco tenements, we come upon a red brick front, of charming, if a little immoral design, by Norman Shaw. This part of South Kensington is a fair type of London generally, but carried out in the big. The same curious incongruity with the surroundings—the same, so to speak, selfishness of design, is to be seen on every side. The architect of the present day seems to consider few things more desirable in our London streets than the breaking of a long tame sky-line; and straightway each goes and does it in his own manner. Perhaps it is better so; it is only through the extreme that we shall get to the means of a national style; and a national style we must have, sooner or later. There is a continual striving after better things, a longing for the tasteful and the true in art, that leads us not to rest and be thankful, but rather to work and be hopeful. But in this desire for better things what we have to be most grateful for, and, as Englishmen, most proud of, is the vast change that has come over the taste of the general public as regards the interior decoration of its dwellings — a change due to no man more than to Charles Eastlake, and to one fact more than the immense importation into this country of the varied artistic produce of Japan. Call it fashion, or affectation, or what you will, we can be sure of one thing: that, however that taste may alter its direction from time to time, it will be progressive—we shall not soon come back to the wall-papers of hideous colours and ignorant design; the furniture of marvellous contour and unmeaning carving; the carpets, coverings, and curtains that infected the atmosphere of our youth. It is true we must, most of us, inhabit the dreary stucco structure that speculative mania has left a legacy to the country; but when we have passed the threshold, it is our own fault if its interior appearance fulfils the ideal of the constructor. Having described an ideal house furnished in the false taste of twenty years since, Mr. Lee remarked that what is vaguely termed "good taste" will not do the educational work unsupported. It is the experience of the past, the knowledge of what to avoid and what to seek, the recognition of true principles of design and study. The heaven-born genius may no doubt venture to walk alone, and all he does be good; but such are not common—more ordinary mortals must use more ordinary means, and they are at hand. On every book-stall we find appeals to the public, in little books on the drawing-room, the dining-room, and every other room, written by enthusiastic converts to the new order of things; which little books, if not very clever, and not very deep, distinctly have their educational use, and do much towards leading the neglected British householder into the right way of thinking. And if, as appears probable, this class of work continues to be freely offered to, and accepted by the world in general, we may look forward to a time, not far distant, when the old type of Philistines will become as rare as is, in the present day, the good old Tory.

Mr. T. Roger Smith remarked upon the contrast between the present brilliant gathering in the Institute-room, and the early days of the Association, when he and others met in a sanded parlour before a large fireplace, with other surroundings having an air of simplicity and uncouthness, at Lyon's-inn-hall. Mr. Lee had dwelt on the past of the Association, and he, while congratulating members on the changed circumstances, would invite attention to a question of the future, a hobby which the speaker had trotted out for many years, that of a diploma for architects, as a means for obtaining a status and recognised position for members of the profession. He would remind members that in and after 1882, admission to the rank of Associate in the Institution would only be obtainable after examination. This was an important step towards a real and authoritative diploma such as marked other professions, for membership of the R.I.B.A. was a badge which would be increasingly looked up to and striven after. The Association was to a great extent an educational body, and the proposed compulsory examination ought to prove a great stimulus to members to avail themselves of its classes, an incentive which should be far greater than that of mere prizes. He trusted that the scheme would spur and encourage the members to redoubled exertions, and he looked upon the attendance of the evening as a happy augury for the future.

Mr. T. Chatfeild Clarke said the chief question for consideration by young men at the present moment was how best to meet the competition of the age. It had been said in that room that young men must push themselves in life. He altogether dissented from this view, and believed the true way for a young architect to rise was not merely to surrender himself to the rules of professional etiquette, but to maintain a standard of high personal honour and honesty. They had been recently saddened by the deaths of two men, Thomas Henry Wyatt and Benjamin Ferrey, whose high rank in the profession, and esteem amongst its members, was due to strict adherence to this rule. Indeed, he held that if an architect pursued his work honestly, earnestly, and well, he would be bound to succeed. He must not bate one jot of heart or hope—he must take all the advantage of educational facilities possible to him, and by so acting, in due time he would reap the reward of a professional career in which he would find everything to gratify the instincts of an artistic and cultivated mind.

After a few congratulatory words from Mr. R. Phené Spiers, the members and visitors adopted the suggestion of the President, and "adjourned to a lower level" to seek the attractions of music, pictures, and refreshments.

BIRMINGHAM ARCHITECTURAL ASSOCIATION.

THE annual meeting of the members of this association was held on Tuesday evening. The President (Mr. C. Ingall) occupied the chair. The report showed that the roll of members was now 41—27 being ordinary and 14 honorary members. The President, in his address, said that, he ventured to think no young practitioner could form any idea of the wonderful facilities for the practice of their art which had been opened up to them during the past thirty years. Nor did that apply specially or chiefly to any one department of their work. It applied to the accelerated speed at which large and important structures were now raised, to the improved means of construction, to the readier means of production, and, lastly, to the architect himself, as to the marvellous facilities opened for his professional instruction. In order to illustrate his address more clearly, he referred to the threefold departments—construction, production, and instruction. With regard to the former, the President pointed out that thirty years ago the great railway system was in its infancy, many of the most important engineering works being only then about commencing. From 1835 to 1850 there were great efforts in invention, in order to produce machinery and other appliances for the rapid and easy construction of all kinds of works. Everything that could lighten labour and lessen time was resorted to. Some inventions had been employed in the machinery which now enabled the architect to complete work in a few years that would, half-a-century ago, have occupied, most probably, his lifetime. St. Paul's Cathedral was thirty-five years in course of erection; but he believed, with their modern appliances, it might have been built in half the time. As regarded production, there were greater means now at the architect's disposal for producing to his own special design, both as to the material to be used and the skilled labour required. Thirty years ago the difficulty of finding labour for working any exceptional design or pattern was immense, but now, however, there were great facilities for carrying out any particular design. In everything that could contribute to the perfecting of the artistic workman they were all most interested, and he hoped the day was not far distant when in Birmingham the prayer of its architects and art-workers would have its answer in the possession, as a part of the contents of the new Art Gallery, of all such collections as would help to form sound taste, teach the eye, and guide the hand of every earnest student in art. In reference to instruction, he said he believed in no age of the world had the architect enjoyed such facilities for mental culture, and the acquisition of knowledge essential to his art, as in the present. Books, railways, museums, newspapers, all conspired to lay at his feet the treasures of art. There was perhaps no building in the world that had exceptional merit or historical fame, but that the libraries of the present age would furnish illustrations of. There was scarcely a beautiful work of art, be it metal-work or carving, stone or wood, which, by model or drawing, was not reproduced within the reach of the architectural student. He believed all the influences of the age were with them. Among other things, he believed the great increase of national wealth was in their favour. Men were no longer content with a mere house, a warehouse, or a shop that would simply afford shelter and light, but in all these things they wished to express a wholesome rivalry, and to manifest their increased means in all the structures they used or occupied, and to surround themselves with the fitting expressions of their increased wealth. In conclusion, he referred to an element of the future of their practice, and pointed out the absolute liberty which was conceded to architects as to style.

BIRMINGHAM MASTER BUILDERS' ASSOCIATION.

THE annual meeting of the members of this association was held on Wednesday afternoon, at the Great Western Hotel, Birmingham; Mr. W. H. Parton presiding. The secretary (Mr. W. Clulee) presented the annual report, which stated that many of the questions affecting the trade, and alluded to in the report of last year, had been adjusted. The reduction of wages and the modification of the working rules —matters strenuously resisted by the operatives from time to time with great determination—had at length been settled, with the aid of the Mayor of Birmingham, who kindly acted as arbitrator, and it was the sincere wish of the committee that they would now be allowed to rest until such period that the state of trade or other circumstances would absolutely justify one or the other branch of the trade in again seeking alterations. Animated by a desire not to disturb the trade on small matters, the committee had not served any notices for alterations of the working rules on the operatives this autumn, although they did not succeed in entirely effecting their object last year with the notices then given. It was generally hoped that a reduction of wages, and in the price of materials, would tend to stimulate operations in the building trade, but the committee much regret they were not yet able to congratulate the association upon that result. The council, at a meeting held at Derby on the 13th inst., had decided to defend actions brought against any member under the Employers' Liability Act at the expense of the association, so far as the legal costs only go, in such cases as the council considered should be defended, until the 23rd January, 1881, when future action would be decided upon by the general meeting of the association, to be held at Manchester. The committee requested any member against whom proceedings might be commenced to at once communicate with the secretary of this association. The standing committee had met on one occasion, and disposed of a minor dispute. Conciliation meetings had been held with each branch of the trade, also general meetings of the same collectively, to endeavour to settle the working rules without recourse to arbitration, but these were eventually settled in this manner. The balance-sheet showed total receipts for the year £129 4s., which, added to last year's balance of £129 16s. 2d., made a total of £259 0s. 2d.; and the various disbursements, including secretary's salary, to £140 14s. 11d., leaving a sum of £118 5s. 3d. to the credit of the association. In consequence of the reduction that had taken place in the prices of labour and materials, the committee had compiled and published a revised schedule of day-work prices. The association now numbered 73 members.

The members subsequently dined together at the hotel; Mr. W. H. Parton again presiding. Amongst those present were Messrs. J. Webb (treasurer), J. Garlick, J. Moffatt, T. Surman, J. Horsley, J. Bowen, W. Sapcote, C. W. Barker, W. T. Bennett, G. Barfield (Leicester), R. Dennett (Nottingham), J. Heath (Kidderminster), G. Moore, (Walsall), W. Robinson, J. T. Butt, and G. Higham (Wolverhampton), R. Mann, R. Sapcote, J. Bunkle, W. G. Bowen, R. Nicks, B. Simcox, Matthews, jun., G. Shelley, Hubbard, and W. Clulee (secretary). The usual loyal toasts having been drunk, Mr. J. Garlick proposed "The Town and Trade of Birmingham." He was sorry to say that trade was not in a satisfactory condition, and he was afraid there was not much chance of improvement. He found the same state of affairs in every part of the country. They were all trying which could be the lowest for a job, and not which could obtain the most money. Having made a few practical suggestions to the members, he said the association must be utilised, not only in defending its members against workmen's infringements, but in the assistance of each member in many ways, particularly in giving information to one another. Mr. G. Shelley, whose name was coupled with the toast, responded. The President, in proposing "Success to the Birmingham Builders' Association," said the association had been established about twenty-five years, and during that time it had acted on the defensive. The tables were turned last year, in consequence of the wages of the operatives having so greatly advanced that they were obliged to give notice of a reduction. Conciliation meetings were held with each branch of the building trade, and what appeared likely to turn out as a long and disastrous strike was averted, through the kindness of the Mayor in consenting to act as umpire between them. The award was believed to be eminently satisfactory both to the operatives and the employers. He said "eminently satisfactory," because since the Mayor's award the standing committee had not been called together on any occasion, whereas previously to that they were frequently holding meetings. Notices had now been received from the carpenters and bricklayers for an increase in wages. The carpenters were asking three farthings an hour, and the bricklayers ¼d. per hour, and alterations in the working rules. He really did not know how to denounce that act on behalf of the operatives. The very least he could say of it was, that it was ill-timed, very injudicious, and calculated to do great injury, just as they might reasonably expect an improvement in trade. The demand would be opposed by the committee to the uttermost, and he hoped they would be able to give a good report upon a future occasion. In referring to the Employers' Liability Bill, he said the National Association of Master Builders had done everything they could in the interests of the employers of labour, and through their exertions clauses favourable to the trade had been inserted in the Bill.

POINTING RUBBLE WALLS.

THERE is one piece of folly, writes Mr. J. H. Parker, C.B., in the *Antiquary*, in which the Victorian architects have indulged during the last ten years (1870-1880) to an enormous extent, and for which they will be certainly heartily laughed at by their successors, and perhaps often accused of *jobbery* also; I mean the *pointing* of rubble walls. No more childish folly can be imagined! Such walls were never intended to be seen by the persons who built them; they were always intended to be plastered over both outside and inside—outside to keep the wet out, because some kinds of stone will absorb an enormous quantity of water, and when a wall three or four feet thick has become saturated with moisture, it is very difficult to get it dry again. On the inside they were intended to be plastered for the purpose of being painted upon.

Painting the walls was part of the design of every Mediæval church, quite as much as painting the windows; modern architects have generally restored the latter, but have almost universally neglected the former. It is true that these paintings, which were generally of Scriptural subjects, were almost universally whitewashed over by the ignorant and bigoted Puritans of the seventeenth century; but surely one of the great objects of *restoration* is to do away with the mischief that has been caused by ignorance and bigotry. The remains of the old painting have been found when sought for almost universally in all parts of the country. So long as the plaster was left on the rubble walls there was a chance of finding the remains of paintings upon them; but when the plaster is all scraped off for the purpose of putting good mortar between the joints of rough stones, which is called *pointing* them, our successors will be under the necessity of plastering over our pointed walls in order to paint them, for the restoration of painted walls in the next generation is a certainty. Forty years ago, who would have thought of restoring painted windows? yet this has now been done, or is being done, everywhere. The importance of "teaching by the eye" is getting to be generally understood. Educated people see that ignorant persons understand much better, and remember much better, anything of which they have seen a representation than what they have only heard of or read about.

THE LATE SIR THOMAS BOUCH.

SIR THOMAS BOUCH, civil engineer, and the designer of the unfortunate Tay Bridge, died on Saturday morning at Moffat, where he had been staying for the benefit of his health for several weeks. The deceased was fifty-eight years of age. For thirty-two years he had been connected, more or less, with the North-British Railway. He was the first to devise and perfect the great improvement in transhipping over the Forth and Tay ferries loaded waggons by large steam ships. He was also identified with the laying down of many local lines in the East and North of Scotland, which have now become part of the North British system.

Leaving the service of the Edinburgh and Northern Railway Company in the end of 1850 or beginning of 1851, Mr. Bouch commenced business in Edinburgh on his own account as a civil engineer. Up till that time the construction of railways had been excessively costly, and Mr. Bouch was one of the first to promote a more economical system. Taking advantage of the increased power of traction obtained by the improvement of the locomotive, he introduced steeper gradients than had previously prevailed, and in that way reduced the cutting and tunnelling which had formed so expensive a feature of railway engineering. The adoption of this principle gave a great stimulus to the development of the Scotch railway system; and Mr. Bouch successively acted as engineer for the Peebles line, 20 miles in length; the Leven line, of 6 miles; the Leslie line, of 5 miles; the Kinross-shire line, of 8 miles; and the Leadburn, Linton, and Dolphinton line, of 10 miles. He also designed the Kirriemuir and Blairgowrie line, the Crieff Junction line, the Crieff and Methven line, the Penicuik line, the Edinburgh, Loanhead, and Roslin line, the St. Andrews line, the Glasgow and Coatbridge line, the Leith and Granton new connections, the Newport line, the Arbroath and Montrose Railway, 17 miles long, which is now on the eve of completion, having cost about £200,000; and the Edinburgh Suburban Railway, 7 miles in length, which was sanctioned in last session of Parliament, and is estimated to cost £225,000. He planned and carried through many lines on this side of the Border, including the Darlington and Barnard Castle Railway, 20 miles; South Durham and Lancashire Union Railway, 50 miles; Eden Valley Railway, 20 miles; Cockermouth, Keswick, and Penrith Railway, 25 miles; Lancashire Union Railway, 25 miles; and Sevenoaks and Maidstone Railway, 20 miles. In 1868-9 Mr. Bouch laid out the London Tramways and the London Street Tramways (Limited). Succeeding sessions found him promoting the Glasgow, Edinburgh, and Dundee tramways, and he was also employed as consulting engineer in connection with other tramway schemes. In the carrying out of the various railways with which he had to do, Mr. Bouch had extensive experience in the construction of bridges. About 22 years ago he erected over the Tees a structure of stone piers and lattice girders, somewhat similar in design to the south section of the Tay Bridge. This viaduct embraced five spans of 120 feet each, their greatest height from the river being 130ft. Among the other bridges he designed were the Deepdale Viaduct, consisting of eleven spans of 60ft. each, the greatest height above the water being 160ft.; the Beelah Viaduct, with sixteen spans of 60ft. each, and an extreme height of 196ft., the piers consisting of cast iron columns; the Redhaugh Bridge over the Tyne at Newcastle, comprising two spans of 260ft. each, and two of 240ft.; and the Bilston Burn Viaduct, where lattice girders are carried on brick piers. It was, however, as designer of the ill-fated Tay Bridge, and of the Forth Bridge, which still remains in the category of unrealised possibilities, that Mr. Bouch's name was best known. He was knighted about twelve months since.

AN IMPROVED SEWER SECTION.

AN ingenious method of constructing the curve or section of an egg-shaped sewer is recorded in a recent number of the *Journal* of the American Society of Civil Engineers. The design proposed was adopted by Mr. C. G. Force, at Cleveland, in consequence of the failure of some sewers that had been constructed according to the usual egg-shaped section used in this country. In this form, published in most engineering treatises, the arched crown is a semicircle, and it follows the greatest breadth of the sewer is at the spring-line. The vertical diameter is one and a half times the transverse diameter, hence the spring-line is two-thirds of the vertical diameter above the base, and the radii of the side arcs are equal to the vertical diameter, and the invert arc a fourth of the transverse diameter. By this construction the sides are very slightly curved, indeed, nearly straight, and it was found difficult to keep the side walls and invert in proper shape until the arch could be completed and loaded, as the quicksand and water exercised a lateral pressure, and several failures occurred in large sewers of 6ft. by 4ft., with 8in. walls laid in hydraulic cement. To obviate this cause of weakness, the author adopted another form of section which, while retaining a small invert, gave more curvature to the side-walls below the crown and decreased their height—an important point in large sewers constructed in treacherous ground. This section may be described as follows:—Draw a circle, and divide its circumference into six parts, allowing a vertical line to pass through two opposite points in the division. Draw two lines indefinitely through the three upper points, and also two lines joining the extremities of the first and through the lower point in the circle, so as to form limiting radii. From the lowest point, with radius equal to that of the circle, describe the arc between the radii, and from the other three points, with radii determined by the first arc, complete the oval. By this construction, the springing-line is more nearly central, and therefore the most expensive part of the sewer is reduced. We think the method, which is analysed at some length in the paper, is an improvement on the form of sewers constructed in loose ground, as it more closely approaches the circular form.

The theatre at Douglas, Isle of Man, is being reconstructed from the designs of Mr. R. Watson, of Leeds.

COMPETITIONS.

Manchester.—After a delay of about eight months, and a great deal of undignified squabbling, the second and third premiums offered for designs for the reconstruction of the Chorlton Union Offices have been awarded by the Board of Guardians as follows: 2. Mr. J. Mottram; 3. Mr. J. Lowe, both of Manchester.

St. Mary Cray Cemetery, Kent.—The Burial Board of St. Mary Cray have approved and awarded the first place in the cemetery competition to Mr. Edward Clarke, Adam-street, W.C., and instructed him to prepare plans and obtain estimates for the erection of the chapel, mortuary-lodge, and fencing at once.

Yeovil.—Messrs. Robert Boyle and Son's system of ventilation, has been selected by the directors, from the competition plans submitted for the ventilation of the Town Hall, Yeovil.

SCHOOLS OF ART.

Nottingham. — The annual meeting of the Nottingham School of Art was held last week. The report of the Committee dwelt at some length with regret on the retirement of Mr. Rawle, who, after fourteen years' most able service at Nottingham, has recently accepted the Head-Mastership of the West London School of Art. Mr. Rawle is to be succeeded by Mr. Dagleish from South Kensington. Mr. Rawle's report stated that the position taken by the school is as gratifying as in former years. In the examination of the highest grade the results are greater than they have been in any prievous year. In all stages of instruction the students have continued to show the utmost zeal and industry; and, notwithstanding that the standard of excellence adopted by the Science and Art Department is higher than it has ever been before, the students have maintained a proud position; and the honours of the Nottingham School have been obtained by fewer students, with a smaller number of works. Last year 491 students submitted 4,689 works for the criticism of the Government Examiners at South Kensington. This year 434 students sent up 3,839 works. One hundred and fifty-one Schools of Art entered the National Art Competition. Nottingham obtained 4 of the 43 silver medals; 7 of the 73 bronze medals; and 9 of the 155 Queen's Prizes—making a total of 20 awards, against 23 last year. The examiners, in their printed official report, allude specially to the lace designs in the following words:—"The designs for lace again call for admiration for their execution and propriety of delicate treatment." The Committee of Management of one of the Continental Schools of Art expressed a desire to purchase three of the Nottingham students' works, in this year's competition, viz:—A design for lace, a design for a wall paper, and an architectural design. Twelve students obtained "Government Free Art-studentships," being eight more than last year. In the "Government Payments on Results," for works executed by the students during the twelve months, there is a marked improvement upon the previous year. This year 35 artisan students earned the full grant for elementary works, against 28 last year, and 40 earned the full grant for advanced works, against 26 last year. This year 64 students had their advanced works marked for "Government Third-grade Prizes," against 59 last year. In the "Advanced Third-grade Government Examinations," which are of the highest grade held in Schools of Art, Nottingham has this year gained greater results than have ever yet been obtained by any school in the kingdom, having won 8 Queen's prizes (in addition to those gained in the national competition), against 7 last year. The students acquitted themselves thus in the following subjects:—In ornamental design, 4 Queen's prizes, 6 goods, 10 passes; in advanced perspective, 3 Queen's prizes, 4 goods, 1 pass; in architecture, 1 Queen's prize, 1 pass; in drawing from the antique, 1 pass; and in painting still-life from nature, 4 passes. The results of this year show, with 44 candidates, totals of 8 Queen's prizes for excellence, 10 goods, 17 passes, and 9 failures; whereas last year, with 50 candidates, there were 7 Queen's prizes, 6 goods, 21 passes, and 16 failures. There is a like improvement shown in the "Second-grade Government Examinations." This year 232 candidates sat for 340 papers, gaining 46 excellents and 115 passes. Last year 230 candidates sat for 340 papers, gaining 35 excellents and 112 passes.

Building Intelligence.

Castle Howard.—The renovation of the seat of the Howards has, after thirteen years of constant labour, been completed, and the structure is now almost as compact as when it left the hands of Sir John Vanbrugh. Some idea of the cost of renovation may be gathered from the fact that over 100 tons of lead have been used in repairing the roofs alone; and upon the decoration of the private chapel, a room about 60ft. by 30ft., over £15,000 has been expended. The frescoes and other mural decorations in this part of the building are by Mr. Kemp, of London, and the stained-glass windows have been designed by Mr. William Morris. The large statues on the north and south fronts are between 8 and 9ft. high, and many of them had become so worn by the weather as to make their removal imperative. These have been replaced by others executed in blocks of stone from Whitby, by Mr. Roddis, of Aston.

Docklow.—The parish-church of Docklow, near Leominster, has been reopened after restoration from the designs of Mr. Nicholson, of Hereford. The work comprises the rebuilding of the porch, of the upper stage of the tower, and of the south-east walls of the nave and chancel. The nave and chancel has been re-roofed with pitch-pine. The stone used in the main walls, &c., is Luston stone, and the sculpturing inside is the work of Mr. Boulton, of Cheltenham. The chancel floor has been laid with Godwin's encaustic tiles. Mr. Hodnett, of Dockley, was the contractor. The cost of the restoration was £1,080.

Everton.—A residence for Colonel Goff has just been completed at Everton, near Lymington, from the designs of Mr. Geo. R. Crickmay, of Westminster and Weymouth. The style is a free rendering of the Elizabethan Domestic. The house is built of red brick, with Bath stone dressings. Red tiles are also utilised in the walls, whilst the gables are of half-timbered work. The building rests upon a Portland stone plinth. The ornamental carved work in wood and stone upon the building has been executed by Mr. Harry Hems, of Exeter. The contractor for the whole of the works is Mr. A. H. Preen, of Blandford. The foreman is Mr. Martin.

Fulham.—A new convent and chapel for the nuns of the Carmelite Order, situated in Lillie-road, Fulham, was opened by Cardinal Manning on Friday week. The building is from the designs of Messrs. Goldie and Son, of Kensington, and follows strictly the lines of Continental monastic establishments. Fronting the road are the convent chapel and out-cloisters, the cloisters and necessary offices forming the other sides of a quad around an open court. The chapel is in the Early Pointed style; the external materials are red brick and Bath stone dressings, and the roof is covered with light grey slates, laid in an unusual pattern, and in its centre is a spirelet. The woodwork of the interior is of stained oak, and provision has been made for the accommodation of a small secular congregation. Messrs. Lucas and Sons, of Kensington, were the contractors, and the cost has been over £11,000.

Liverpool.—The foundation-stone of a new home for aged mariners was recently laid at Egremont, Liverpool. The main elevation, which is 170ft. in length by a depth of 65ft, and a height of 36ft. to the eaves, possesses a well-broken outline. A projecting central bay, having a circular oriel, rises above a wide and deeply-recessed principal entrance. The greater portion of the moulded features, chimney stacks, &c., are being executed of specially-designed moulded bricks. The roofs will be covered with an unfading green slate. The tower, rising to a height of 82ft. to the spring of the roof, is finished with a slated spire, with angled turrets. The whole of the walls are encased externally with brick similar to the terra-cotta. The contractor for the works is Mr. Richard Beckett, of Hartford, Cheshire, the amount of the contract being about £10,000. Mr. Edward Roberts is the clerk of the works, and the architect Mr. David Walker, of 11, Dale-street, Liverpool.

Maidenhead.—The new town hall buildings, and other borough offices at Maidenhead, were opened on Thursday week. Messrs. Cooper and Davy are the architects, the contractor being Mr. T. H. Kingerlee, of Banbury. The total cost has been about £4,000. The Town Hall measures 65ft. by 30ft., and is 24ft. in height. The Council Chamber—23ft. 6in. by 16ft. 4in.—adjoins; and retiring rooms are also provided. The roof has been restored and brought out, and means of access to the summit—which commands a fine view—are provided. A new police-office and lock-up, at the rear, are to be at once commenced, at a cost of £630, the amount of Messrs. Woodbridge's tender.

Southburgh. — The parish-church of St. Andrew, Southburgh, was recently reopened by the Bishop of Norwich after restoration effected at a cost of £4,000. The church has been rebuilt, with the exception of a small portion of the east wall, the old lines having been followed. During the restoration two frescoes were found —one of St. Christopher in its usual position on the north wall of nave, the other a representation of our Lord. The remnant of a chancel-screen, with its traces of colour and gilding, has been preserved, and the defective portions renewed, and an Easter sepulchre, double piscina, and sedilia are retained in their original positions. Mr. J. A. Reeve, of Great James-street, Bedford-row, W.C., was the architect; and Mr. John Goss, of Shipdham, the contractor.

South Shields.—Two Board-schools for infants have recently been opened by the School Board. In each case accommodation is provided for 350 children, and in each school there is a large room with a gallery recess, and four class-rooms. These rooms are so arranged that the head mistress at her desk, or taking a class seated in the gallery, can, at the same time, have complete supervision of the whole school. It is intended shortly to erect boys' and girls' schools in extension of both of these groups, and for which the preliminary arrangements have been made. The contractors were Mr. Robert Allison, of Whitburn, and Mr. John Grisdale, of Newcastle-on-Tyne. Messrs. Oliver and Leeson, of Newcastle, were the architects.

Steetley.—The Norman church of Steetly, situate three to four miles from Worksop, has been reopened after restoration. The building sonsists of a nave and chancel, terminating in an apse, the two collectively being 56ft. long. The nave and chancel had for many years been roofless. The church has been restored as nearly as possible to its original state by Messrs. Shilleto and Morgan, builders, of Hull, under the direction of the architect (Mr. J. L. Pearson, R.A.). The ivy has been removed from the walls, which have been thoroughly cleaned and renovated, many of the carved heads, &c., having to be replaced; the outer portion of the porch (nearly the whole) has been reconstructed, an oak door has been affixed, and an entirely new roof, supported by massive oak beams, put on. The contract for the work was £1,151 1s. 6d., about £106 of which has yet to be collected, besides £174 for other expenses. The church is not capable of seating more than 80 persons.

Sydney (N.S.W.)—The works of St. Mary's cathedral are being carried out with a considerable degree of activity, and it is anticipated that the building will be fit for occupation by the 6th of January, 1882. Archbishop Vaughan, soon after his arrival in the colony, signed a contract for £21,000, in order to enable the work to be carried out, and of this amount £11,000 has already been paid off, leaving a debt of £10,000. A second contract has just been signed for the completion of the building, so as to render it fit for service, the amount of the contract being, in round numbers, £20,000, so that there is now an existing debt on the building of £30,000. The four walls are to be built up 4ft. higher than they are at present, and the cathedral will be temporarily roofed in. A large portion of the work to be carried out under the present contract, however, will be of a permanent nature, such as the building of the chapter-room, courts, and sacristy.

Walkern.—The fine old rood screen has been restored in the parish church of St. Mary Walkern. Some parts of the church are very old, dating probably as far back as the early part of the 13th century. Mr. Hugh Roumieu Gough, F.R.I.B.A., of Queen Anne's Gate, Westminster, S.W., was the architect employed. Interesting as an excellent example of Perpendicular Gothic woodwork, this screen is some twelve or thirteen feet high, and reaches right across the chancel. The lower panels are filled with traceried and carved work. Above, pierced open work bursts out from the supporting standards, and exhibits much delicate and refined detail thereon. The main cornice above is deeply moulded and has its hollows enriched by detached patera. A new moulded cill has been put in as a footing, and the main uprights, which were in a bad state of decay, have been scarfed and morticed. On either side of the central doorway are buttresses surmounted by carved pinnacles, and similar buttresses are in similar positions upon the other uprights. The screen had been bedaubed with a variety of coats of paint, whitewash, varnish, graining, &c., by successive generations of churchwardens. These have all been removed, and the old brown oak stands out in all its beauty. The work was entrusted to Mr. Harry Hems, of Exeter.

West Vale.—The foundation-stone of a new church of St. John was laid at West Vale, Halifax, on Saturday week. The edifice is situate behind the Board-schools, and is being erected from the designs of Mr. Rushworth, of Carlton-chambers, Regent-street, London, the style being a modification of Transitional Norman. It will consist of a nave and aisles 70ft. 6in. in length by 52ft. 7in. in width, chancel 27ft. 9in. long, baptistery at west end of north aisle, organ-chamber and vestry for clergyman at east end of same aisle, choir-vestry at east end of south aisle, and a tower 17ft. square at south-western angle of nave. Accommodation will be provided for about 500 persons, at an estimated cost of £3,500. The contractors are:—Mason's work, Mr. F. Riley, Ripponden; joiner's, Mr. E. Furness, Greetland; plasterer's and slater's, Mr. D. Smithies, Brighouse; and plumber's, Mr. S. Calvert, of West Vale.

Woolwich.—H.R.H. the Duke of Connaught publicly laid the memorial-stone of a new Coffee Tavern and Public Hall at Woolwich on Saturday. These buildings are now in course of erection. In a half basement is a club-room, 44ft. by 24ft., well lighted and ventilated, with a distinct entrance, and provided with ample cooking convenience; a manager's room, kitchen, scullery, and store rooms, lavatory, and offices. The whole of the ground-floor is devoted to the coffee-tavern proper, embracing an area of 2,600 superficial feet. The one-pair floor is of the same size, and contains a board-room, ladies' refreshment-room, and 12 sleeping-rooms, with bath and lavatory in connection. The top-floor is devoted to a public hall, 41ft. by 68ft., with a gallery at one end, affording accommodation for nearly 1,000 persons. The internal finishings throughout will be of stained and varnished deal or pitch-pine. The windows of the hall will be glazed with coloured and ornamental glass, and the ground-floor with plate-glass and ornamental quarries. The sashes and facias of the coffee-tavern are of mahogany and oak, French-polished, with Suffolk brick pilasters dividing same, with red bases and black plinths; the caps, cornices, window-heads, and mullions, are of red Mansfield stone, with minor members of Bath stone. The facings of yellow malms, with ornamental bands of red and black bricks. The contract price for the building is £6,000, in addition to £2,000 for purchase of lease, furniture, &c. Messrs. Lonergan and Sons, of Plumstead, are the builders; and Mr. W. Rickwood, also of Plumstead, the architect.

New banking premises have been erected at Haltwhistle, for the Carlisle City and District Banking Company (Limited). The buildings comprise, on ground-floor, banking-rooms and county-court offices, &c., and above, a residence for bank manager. The contractor for mason-work was Mr. George Westgarth; the joiner, Mr. J. McAdam, both of Shotley Bridge. Mr. Ormerod was the plasterer, Messrs. Thompson and Sons, plumbers, Messrs. Smith and Son, slaters, and the painter was Mr. Canning; all the last-named being Carlisle tradesmen. Messrs. Hethrington and Oliver were the architects, and the building has been erected under their immediate superintendence.

The newly-erected "Dolphin" coffee-tavern, situate in the Market-place, Newton Abbot, was opened on Saturday week. The tavern has been erected from the designs, selected after competition, of Mr. C. Jenkin Jones, architect to the London Coffee Tavern Company, by Messrs. Stacey and Rabbage, the contract price being close upon £1,370.

More than Fifty Thousand Replies and Letters on subjects of Universal Interest have appeared during the last ten years in the ENGLISH MECHANIC AND WORLD OF SCIENCE, most of them from the pens of the leading Scientific and Technical Authorities of the day. Thousands of original articles and scientific papers, and countless receipts and wrinkles embracing almost every subject on which it is possible to desire information have also appeared during the same period. The earliest and most accurate information respecting all new scientific discoveries and mechanical inventions is to be found in its pages, and its large circulation render its the best medium for all advertisers who wish their announcements to be brought under the notice of manufacturers, mechanics, scientific workers, and amateurs. Price Twopence, of all booksellers and newsvendors. Post free 2½d. Office: 31, Tavistock street, Covent-garden W.C.

TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

ADVERTISEMENT CHARGES.

The charge for advertisements is 6d. per line of eight words (the first line counting as two). No advertisement inserted for less than half-a-crown. Special terms for series of more than six insertions can be ascertained on application to the Publisher.

Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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(Payable in Advance.)

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To American Subscribers.—American subscribers are requested not to pay any more subscriptions to Mr. W. L. Macauley, of 23, Dey-street, New York City, that person being no longer authorised to receive them.

Cases for binding the half-yearly volumes, 2s. each.

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Also may be had, Vol. XXXVII., price 12s.

N.B.—Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—W. McF. and Co.—G. B. and L.—W. T. and Co.—J. C. and Co.—T. H. C.—F. S. H. and R.—M. Ry. Co.—B. of L.—R. K.—I. R. Co.—O. N. and O.—S. W. R.—G. E. H.

M. B. (Residence is necessary at Oxford or Cambridge, but not at London. In either case the B. A. must be taken first. Full particulars can be obtained of the respective authorities.)—C. M. Bedford. (Yes.)—T. Stokes. (Yes)

Drawings Received.—J. C., W. R., R. A., R. and Son, R. W.

"BUILDING NEWS" DESIGNING CLUB.

Norman. (We have noted your motto and address. The subject to be drawn on one sheet.)—Will. ("J. H. G." and others are informed the club is quite free to all students, that competitors can send in more than one design if they choose, though it is undesirable. The conditions were published at the time. The list of subjects was given.)

Correspondence.

TRAPLESS DRAINS AND WATER-CLOSETS.

To the Editor of the Building News.

Sir,—I cannot profess to be so wholly disinterested in a special kind of trapped hopper basin as Mr. Foster appears to be in the plugged wasteless closet which he advocates; still, I can truly say that my convictions, after tedious and expensive experiments in various directions, were the moving cause, not the consequence, of my pecuniary interest. A very practical, knowing man, at Birmingham, told me, last week, that the plugs *were* liable to leakage under the slightest obstruction. I would prefer something that did not require periodical, or even occasional, removal or renewal, as all indiarubber work is apt to do.

The inevitable plumber, with the smell and other inconveniences pending his arrival, howsoever rarely, is surely a needless vexation, whilst a hopper basin, such as I advocate, is not liable to derangement.

This, however, is not the special point in Mr. Foster's letter in your last number, which seems to demand explanation. He says, "The continuity of the drain should not be broken in any case whatever." But he says also, that the soil-pipe, continued up for ventilation, should have "an inlet for fresh air at its foot." How are these apparently contrary statements to be reconciled? My own experience tells me that an upward draught cannot be insured under all conditions of the atmosphere; and I know how difficult it is to avoid smell under such circumstances.—I am, &c.,

Wimpole-street. William White, F.S.A.

Sir,—Referring to Mr. Moxon's remarks on p. 514, he appears to have overlooked the inlet for fresh air at the foot of the soil-pipe. The only difference between the arrangement he describes and my own, in the matter of ventilation, is that in the former the inlet is at the top of the soil-pipe with the outlet some distance off, whilst, with the latter, which I consider the best, the inlet is at the bottom and the outlet at the top of the soil-pipe. In reply to Mr. Buchan, respecting a certain quantity of foul air entering through a trapless closet when the plug is lifted, if the soil-pipe be acting also as a ventilator, he certainly cannot have tried it, or he would not make the mis-statements he does. Concerning his remarks as to a deficient water supply, no closet, if the supply was properly arranged by a competent man, with water-waste preventing cisterns, would ever be deficient of water, no matter from what source the supply to the house was derived.

Alluding to the plug of a trapless water-closet, Mr. Buchan goes on to say "this plug would be of no service as a safeguard if a hole happened to be made in the pipe below the plug." In trapless closets where the portion under the plug is of galvanised iron there are not likely to be any holes made, unless purposely drilled, which no sane person would think of doing, and providing that on examination there should prove to be a crack or flaw in the apparatus, it would naturally be rejected at once, and it would scarcely redound to any maker's credit to send out imperfect and faulty manufactures; assuming, however, that any of the portion alluded to by Mr. Buchan was of earthenware, it should be protected from frost, and if it became cracked from this or any other cause after fixing, it would necessitate a new pan, &c., being substituted; but any cause that is liable to injure the earthenware portion of a trapless water-closet would be more likely to damage a trapped closet. Any holes that *happened to be made* in the soil-pipe below the plug would be external and not internal, and as Mr. Buchan has facetiously supposed a hole under the plug inside the house, it will be equally fitting and less absurd to suppose one in the bottom of one of those water-closet traps that he is so infatuated with. He goes on to say "in trapless closets, again, with water trapped overflows, the word 'trapless' is a misnomer." This idea is simply copied from my own, on p. 428. There is a certain amount of truth in his remark that some of these trapless closets are also very high-priced, and, in his opinion, not worth half the money. It does not follow, because Mr. Buchan considers trapless water-closets sanitary mistakes, and his own theories everything that could be desired, that they are so: these are merely his opinions, which he has perfect right to; but then others have an equal right to theirs. Mr. Slagg, C.E., on "Sanitary Engineering," p. 103, says, "As the pan closet is the worst form, so the best is that kind which is wholly of earthenware and has a plug valve, the motion of which is vertical and direct, and is situated at the side of the basin." Trapless closets have proved themselves to be the reverse of mistakes, and an apparatus of good reliable make is less costly than a trapped closet of equal quality, as Mr. Buchan will find on referring to the lists of some manufacturers who are makers of both descriptions of water-closets.

Mr. Buchan has previously aired his opinions before the public respecting certain systems of sanitation that were not exactly in accordance with his own ideas, and I beg to suggest that it would be as well for him to examine and test before declaiming against anything of which he has had no practical experience. Mr. John P. Seddon pointed out the importance of this to him in January, 1876; vide his letter to the BUILDING NEWS of that date.

After 28 years' experience Mr. Buchan states he has arrived at the conclusion that traps are a continual source of safety. Now, competent judges condemn them, and my own experience, as well as that of other engineers, is directly the opposite to his. I think this subject of trapping has now been pretty well ventilated, and in conclusion I will just quote the words of an eminent practical sanitary engineer of over forty years' standing who says, "A very general opinion prevails that these 'traps' are the guardians of public health. To be so, they should be perfect in principle, certain in action, permanently efficient, and capable of resisting every influence that would impair their efficiency. For years I have held they do not meet the requirements of health, and this I will endeavour to make clear. Traps, however much they may vary in form, are all the same in principle; all are hydraulic, and in all an inch of water at most constitutes the trap, any greater dip or bend would render the trap more liable to choke than at present, consequently this film of water may be said to stand between health and disease."—I am, &c.,

Cheltenham. G. A. FOSTER.

OUR RAILWAY BRIDGES.

SIR,—Your article on the above subject is well-timed, and correct in every particular.

Amongst insecure bridges—and their name is legion—one of the worst is, or at least was, a small bridge between Leek and Rudyard, on the North Staffordshire Railway.

If your "timely warning" is acted upon, I am assured it will effect a considerable saving in killed and wounded, destruction of rolling-stock and permanent-way, and consequent depreciation in dividends.—Yours, &c.,

Manchester, Oct. 30. F.

A WONDERFUL STOVE.

SIR,—May I venture to draw your attention to the inclosed advertisement, which appeared in last Thursday's *Daily Telegraph*?

The stove in question appears almost too good to be true. The writer declares he has seen it, and as he does not sign his name, I cannot write and ask him where the said stove is to be inspected.

As he professes to be an architect, and as, of course, all architects see the BUILDING NEWS, it strikes me that a letter in your paper may perhaps bring forth the required information from him or from some other of your subscribers.

What I want to know is—

1. Does this stove do all the things ascribed to it.
2. Where is the stove to be viewed?—I am, &c.,

W. BURGES.

15, Buckingham-street, Strand, Nov. 3.

LONDON SMOKE.

To the Editor of the *Daily Telegraph*.

SIR,—Seeing the present agitation on the subject of London smoke and fog, the following account of a most clever invention of a smoke-consuming grate I saw some time back may be interesting. It is, in the first place, self-feeding, so that, without attention, it will burn twenty-four hours. No fireirons are required, but it is regulated by two handles, making in a few minutes either a brilliant red-hot fire or a dull one. It consumes its own smoke, but at the same time will make a bright fire, and as all the heat is utilised, as it cannot pass up the flue, it is also impossible for the chimney to smoke. Again, the size of the fire, by a simple mechanical contrivance, can be made either large or small, remaining the size desired—an inconceivable advantage in a sick-room where a certain temperature is required all night, or in schools, &c. Fresh heated air can also be introduced to the room from the outside. It is in appearance like an ordinary grate, and will burn any sort of coal or coke, but does best with the sort called nut coal—the cheapest sold—and will maintain a good fire for twelve hours for about three-halfpence. It was called "Russell's Patent Grate," and I believe, owing to want of money and opportunity, was never yet put before the public; but it seems to me to be a very valuable invention, and to be very interesting at this time. I am, Sir, your obedient servant,

Oct. 25. AN ARCHITECT.

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New police-station buildings are about to be erected at Strathbungo, south-east from Glasgow, by the Police Committee of the county of Renfrew. The style is Scottish. The plans have been prepared by Mr. Davidson, architect, Paisley; the cost will be about £1,800.

The Clybach Valley Railway, a branch of the Taff-Vale Railway, has just been commenced. Mr. Bilupps is the contractor.

Intercommunication.

QUESTIONS.

[6280.]—**Lighting Schools of Art.**—Wanted (1) the best method of lighting Autique rooms in schools of art by side-windows to north or roof light. (2) Would light from the roof answer the same purpose as a north light, and is it as good?—PUPIL.

[6281.]—**Plaster for Half-Timber Work.**—Can any reader inform me as to the best composition of cement or plaster to be used externally in half-timbered work? It must be durable and proof against weather in a damp and cold district, and it must also have a slight tinge of yellow in its colouring. The workmen to be employed are not accustomed to half-timbered work.—WELLINGTON.

[6282.]—**Commission.**—For a commission of 7 per cent. I contracted to supply plans, specifications, quantities, detail drawings, and superintendence for a villa residence. After the sketches had been approved, and the whole of the ⅛in. working drawings finished, also specifications written and bonâ-fide estimates submitted, my client, becoming dissatisfied with the site, abandoned the project of building. What portion of the commission am I entitled to claim?—W. I.

[6283.]—**Horseshoe Arch.**—Does any reader know of any examples of an arch serving the purpose of an entrance to a blacksmith's forge, and made after the shape and pattern of a horseshoe? I am getting out a design for a blacksmith's shop for a village, and my client desires that I should make use of an arch after that description for the entrance to the shoeing shed. I shall be much obliged for any information.—JOHN M. STURGESS.

[6284.]—**Liability for Quantities.**—Who is liable for errors, deficiencies, or inaccuracies in quantities which have the following notice attached to them: "The quantities have been taken by a competent surveyor, but the architects will not incur any liability as to their accuracy, although they believe them to be correct. The contractor will have to satisfy himself on this point." Payment for the quantities in question was taken by the architect, but they are not alluded to in the contract, the stipulation therein being that the contractor is to carry out the work in accordance with the drawings and specifications.—F.

[6285.]—**Surveyors' Responsibility.**—Can any of your readers give me an instance where a surveyor has been called upon to pay the loss incurred by a mortgagee, who advanced money in the surveyor's valuation?—ALPHA.

[6286.]—**Warming Rooms.**—I shall be much obliged if any reader can suggest a method of warming a room which has no fireplace, without injury to health?—ALPHA.

[6287.]—**Custody of Drawings.**—Can an architect be compelled to lend the client the contract drawings for the purpose of defending an action brought against the client, the architect having ceased to be employed and the building completed?—ALPHA.

[6288.]—**Power of Proprietor.**—Has the proprietor legal power to prevent a contractor measuring up the whole of a job in order that he may test the accuracy of the quantities supplied? The work in question is occupied by the proprietor, but is not completed, inasmuch as he holds the contractor responsible until certain works are altered, and the balance of the contract amount has not yet been paid to the contractor.—F.

[6289.]—**Measuring Brook.**—Along one of the sides of a field, and at outside side of fence is a brook about 11ft. wide from centre of fence to opposite bank. Could anyone tell me how much of the brook should be measured in with the field?—MOWBRAY VALE.

REPLIES.

[6264.]—**Wall Ties.**—We herewith inclose you a reply from Messrs. J. Simpson and Son, Marylebone, W., which please insert in your next edition.—CHAMBERS, MONNERY AND CO. "No. 48, Paddington-street, St. Marylebone, W., 25 October, 1880 Dear Sirs,—We are of opinion that your cast-iron nibbed wall-ties are well adapted for the purpose intended. We have used a considerable quantity, and allow 9 to a yard super of brickwork.—Yours obediently, J. SIMPSON and SON.—Messrs. Chambers, Monnery and Co., 41, Bishopsgate-street, Without, E.C."

[6264.]—**Wall Ties.**—The wrought iron wall-ties should be placed about 2ft. apart vertically and 4ft. apart horizontally, at which distance they should be strong enough to hold the wall mentioned.—JONAS NICHOLS.

[6269.]—**Sea-Sand in Mortar.**—"G. H. G." says the mortar made from sea-sand never hardens. This may be the case when made up with chalk lime, but certainly is not when stone lime is used. Some of the hardest mortar I have ever seen was made with unwashed sea-sand and stone lime. I should not scruple to use sea-sand for brickwork, provided the bricks are not red, for when that is the case the efflorescence shows, but should certainly not use it for internal plasterers' work, for any, at any rate, but of the very commonest description. I have never known a case in which the salt in the sand did not take the colour from the wall-paper, or, if the walls were distempered, show damp at certain times. I have no experience of what washing may do for sea-sand, but, as far as the expense goes, if much of this has to be done, the price would very soon be equal to pit or river-sand.—C. F. M.

[6272.]—**Coloured Drawings.**—An architect, if employed to design a building, can charge no more for a coloured than he can for an uncoloured drawing, unless he was instructed to prepare a specially-coloured view. If no other than the coloured design has been prepared, an architect can charge 1½ per cent. on estimate; but if in addition general drawings have been also prepared, he can fairly claim 2 per cent.—G. H. G.

[6274.]—**Surveyors' Charges.**—It is difficult to say, without knowing the labour undertaken, and the exact circumstances, what "Scotia" should charge. If the land was sold for £25,000 after his plan had been prepared to show its capabilities, he would not be overpaid if he received 100 guineas. If the labour, including laying out the roads and staking the plots, &c., will also be done, a percentage of 1 per cent. would be fair. Some surveyors make a charge on each house, or on the ground rental, but as every case is governed by its own circumstances the surveyor should charge accordingly, if no agreed commission has been arranged.—G. H. G.

CHIPS.

On Tuesday week, a new Wesleyan chapel was opened for public worship at Deighton, near York. The style is Gothic, and the materials used have been Scarbro' yellow bricks; the front being relieved with stone dressings. Mr. E. Taylor, of Stonegate, York, has been the architect, and Mr. Shepherd, of Escrick, the contractor.

The foundation-stone has been laid of a new school mission-church at Eastville, near Bristol. The style will be Early English, and the front will be of Pennant stone, with freestone dressings. Mr. Henry Williams, Clare-street, Bristol, is the architect, and the builders are Messrs. Eastabrook and Sons.

A new English Congregational Chapel was opened at Cardigan on Tuesday week. It is Gothic in style, and is built of dressed Cilgerran (local) stone, with Bath stone dressings. The seats of varnished yellow pine, with topmoulding of pitch-pine. Sittings for 120 persons are provided at a cost, for erection and materials, of £1,485. Mr. Peter Price, of Cardiff, was the architect, and the building has been erected by day-work under the superintendence of a committee.

The river Wear Commissioners last week voted their engineer £400, in consideration of special services rendered in connection with the new lock at Sunderland, opened on the 21st ult., as described by us on p. 511 a fortnight since, and also increased his salary to £600 per annum.

The Hackney board of guardians decided, last week to build an additional wing at the workhouse at an estimated cost of £10,000.

A schoolroom and other additions have just been opened at Hope Baptist chapel, Canton, a suburb of Cardiff. Messrs. D. and J. P. Jones were the architects, and Messrs. Jones Brothers the builders, and the seating was contracted for by Messrs. Williams and Co., of Spotlands. The total outlay has been £2,100.

The first section of the proposed street-tramways at Cambridge was inspected by Major-General Hutchinson, on Monday week, and opened for use two days afterwards. The rails are of steel, laid to a 4ft. gauge, and are spiked into transverse sleepers, laid on a 6in. bed of concrete; granite sets are laid next the rails, the inter-space being paved with tarred macadam. The lines extend from the railway-station to the Church of St. Mary the Great, a distance of 1 mile, 73 chains. Mr. Floyd, C.E., was the engineer, Mr. J. F. Meaton the contractor, and Mr. W. Hart the clerk of works.

A new Congregational church was opened at Carnforth, on Thursday, the 28th ult. The structure seats 200 on the ground-floor, and a gallery is also provided over the class-rooms on the south side. The mason-work has been executed by Mr. McFarlane, and the carpenter-and-joiner work by Mr. Grime, of Settle; the remaining trades have been executed by local tradesmen. The new structure is in the Gothic style of architecture, and has been designed and carried out under the superintendence of Messrs. Hethrington and Oliver, of Carlisle.

The Ilkeston local board have decided to borrow £12,000 for sewerage works, and £2,000 for an additional supply of water. A Local Government Board inquiry will be held respecting the application before Mr. Robert Morgan, C.E., inspector, on Wednesday next.

Last week, during excavations for the Dover and Deal Railway, in the former town, the foundations were found of one of the two round towers by which the entrance to the old harbour, now reclaimed and built over, were defended. These towers are shown in an old picture of "The Embarkation of King Henry VIII. at Dover," but for many years antiquarians had doubted their existence. Traces of one of the towers were, however, found when the London, Chatham, and Dover line was being made, and now the second has been exhumed. They are built of masonry, roughly hewn.

The rural sanitary authority of Hexham has received and referred to a committee a report and scheme by Mr. J. S. Hodgsou, C.E., of Durham, for supplying the districts of Prudhoe, Mickley, and West Wylam with water; the cost is estimated at £11,216, and the mode of supply is by gravitation.

STAINED GLASS.

Ipswich.—The western window in the north aisle of St. Mary-le-Tower Church, Ipswich, has just been filled with stained glass, in memory of the late Mrs. J. Chevalier Cobbold. The subject is the "Presentation of the Infant Christ in the Temple." The dexter light is occupied by the figure of Simeon with the Infant Saviour in his arms; in the centre light is the figure of the Virgin, and in the sinister light is the figure of Joseph, who is carrying in a small wicker basket the pair of turtle doves for the offering. Beneath is the inscription, "Lord, now lettest thou thy servant depart in peace." The lower part of each light is filled in with a scene in the life of Christ.

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STATUES, MEMORIALS, &c.

Exeter.—Some of the parishioners of St. Sidwell's have erected a memorial-cross within the rails of St. Sidwell's parish churchyard to the memory of their late rector. It rises to an altitude of 20ft. from the adjacent pavement. Standing upon a broad basement, composed of triple steps, in red Dumfries stone, the upper portion, in the main, is of Portland stone. This gradually runs off spirally, the higher portions being enriched by diapered work. The whole terminates by a foliated cross. This cross, like the lower steps, is wrought in Dumfries stone. The work was entrusted to Mr. Harry Hems, of Exeter.

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WATER SUPPLY AND SANITARY MATTERS.

Bovey Tracey Water Supply.—An inquiry was held at Bovey Tracey, Devon, on Thursday week, before Mr. J. Thornhill Harrison, an inspector of the Local Government Board, respecting an application from the rural sanitary authority of Newton for power to borrow £1,750 to provide a water supply for Bovey Tracey. Plans prepared by Mr. John Chudleigh were exhibited, and it was stated that the water supply was at present inadequate, and chiefly from an open stream, which was frequently fouled. Eight hundred persons would be supplied with water at a cost of £1,700. An alternative scheme was submitted by certain ratepayers, which had been prepared by Mr. J. M. Pinn, and by which it was estimated a good supply could be brought from the Lower Down at an estimated cost of £1,150; and the inspector requested that further particulars as to this scheme be forwarded to the Local Government Board as soon as possible.

Ulverston.—On Thursday week an inquiry was held at Ulverston before Mr. Samuel Joseph Smith, C.E., commissioner for the Local Government Board, respecting an application by the rural sanitary authority for permission to borrow £1,200 instead of £600, as at first asked for, to carry out sewage and water-supply works at Swarthmoor. Mr. G. R. Farmer, of the firm of Settle and Farmer, engineers, explained the plan he had prepared, and admitted that additions had been made to the scheme. It was elicited from Mr. Greenwood, surveyor to the rural sanitary authority, that a 12in. pipe 1,890ft. in length, had been laid from the irrigation field into the Ulverston Local Board district, and other works done without the consent of either the Local Government Board or the local board of Ulverston, and, therefore, illegally; and that some of the charges now sought to be covered by the town had been paid for out of current rates. Mr. Smith expressed grave doubts whether under the circumstances the rural authority would obtain the sanction they desired; for in the course of his large experience as an inspector, he had never at any place found things in such a muddle as at the Ulverston rural authority, and they seemed to get more involved at every step taken.

London Water Supply.—The delegates of the vestries and district boards of the metropolis held an adjourned meeting on Wednesday to consider the subject of the Water Supply. A letter from the Home Secretary was read, in which he expressed his willingness to receive any representation upon the subject, but declined to say what the Government intended to do next session. A sub-Committee was appointed to prepare suggestions in reply to the Home Secretary and to report to an adjourned meeting of the delegates.

Purification of the Clyde.—A long and interesting report has been made by a deputation appointed by the magistrates and council of Glasgow to inquire into the treatment of sewage in various towns in England. The deputation visited Bradford, Leeds, Leicester, London, Windsor, Brighton, Tottenham, Aylesbury, Coventry, Birmingham, and Bolton, and inspected the pneumatic system of Captain Liernur, at Amsterdam. The sole object in view in undertaking a gigantic system of sewage disposal for Glasgow is the restoration of the Clyde to a state of purity. The deputation arrived at the conclusion that some clarifying process, whereby the whole of the suspended impurities should be removed, was an indispensable preface to discharge into the river. They were decidedly favourable to the intermittent system of precipitation, but would leave the nature of the precipitant to be employed for future consideration.

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LEGAL INTELLIGENCE.

A Builders' Dispute.—At the Ashton County-court, on the 28th ult., Robert Booth and James Gledhill, builders, of Stalybridge, sought to recover from Orlando Cook and Son, builders, of the same place, £20 13s. 5d., of which £9 was paid into court. Plaintiff tendered at £108 to do certain carpenters' work at four houses which defendant was building, but the tender was reduced to £100 in consideration of plaintiffs having the mortising machine, as to which there was now a contention. £10 was also claimed for paint and oil. The defence was that the cost of mortising machine was to be deducted from the last draw of money, and also that plaintiffs had had some old materials for which there was a set-off. The judge considered that defendants' witnesses were mistaken as to the machine, and gave judgment for £11 4s. 7d.

Defective Mortar—Mr. John Synnett, a builder, was summoned last week at Wandsworth Police-court by Mr. Woodward, district surveyor, for using mortar composed of earthy matter in the building of houses in Rollo-street, Battersea-park-road. The complainant said, after receiving notice of the building of the houses, he inspected the mortar and found an absence of sand. He wrote a letter to the defendant giving him notice that the mortar must not be made with earthy matter. He inspected the mortar again and found it very bad, not any alteration having been made. In cross-examination, the witness said there was lime in the mortar, but it contained a large proportion of earthy matter. Mr. Hansom, the district surveyor of North Battersea, produced samples of the mortar which he had taken from the buildings. He said he had dried one sample, which he found contained one portion of lime and the remainder earthy matter and grit. Other evidence having been given, Mr. Paget imposed a penalty of £3, with £2 costs.

Value of Property in the City.—The case of the trustees of the Parish of St. Peter-upon-Cornhill v. the Corporation of the City of London was heard before the Recorder on Thursday week. The claimants are the freeholders of the land, upon which stand two shops, one with a frontage to Gracechurch-street and the other facing Half-moon-passage, known as 89, Gracechurch-street. This property is now required by the City for the improvement, rebuilding, and extension of Leadenhall market; and the claimants sought to recover from the Corporation the sum of £13,842. On the part of the plaintiffs Mr. Fox, of the firm of Messrs. Edwin Fox and Bousfield, with Mr. Thorne, Mr. Andrew, and Mr. Collins, Surveyors, estimated the property, which consisted of a superficial area of 786ft. at £1 per foot for the premises facing Gracechurch-street, and 10s. per foot for that part facing Half-moon-passage.—On the part of the Corporation Mr. Farmer, of the firm of Messrs. Debenham, Tewson, and Farmer, with Mr. Vigers, valued it at an average of 12s. per foot, and said £9,653 was sufficient.—The jury found for the plaintiffs for £11,900.

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CHIPS.

Mr. Chapple, clerk of works at the Abbey, and Mayor of St. Alban's, was re-elected to the council on the 1st inst., being returned at the head of the poll.

The Prince of Wales visited Mr. Herbert, R.A., on Tuesday, to view the picture "The Judgment of Daniel," painted for the House of Lords. The work, in the course of some few weeks, will be placed on the walls of the Peers' Conference-chamber, already decorated with an example of Mr. Herbert's Scriptural subjects, "Moses Descending from the Mount."

The parish-church of St. Mary, Brook, East Kent, was reopened on Thursday week after restoration, effected at a cost of £670. The Norman tower and the walls have been repaired, the outer beams in the roof opened out, and benches substituted for pews, and a large two-light window replaced by one more in harmony with the structure. Mr. J. Piers St. Aubyn, of London, was the architect, and Messrs. Steddy, Joy, and Steddy, of Ashford, were the builders.

A new lodge and entrance-gate have been erected at the Bearhurst approach to Broome Hall, near Dorking, the seat of Mr. Pennington, M.P. The lodge, of seven rooms, is built partly of stone raised on the property, with weathertiling, timber, and plaster-work; the gate is of moulded oak and wrought iron, with piers and walls of local stone, and Bath for dressings. Mr. John Birch, of London, was the architect, and the builders were Messrs. Laing and Sons, of London.

Our Office Table.

A good example of art metal work has just been produced by Messrs. Thos. Brawn and Co., 64, Clement-street, Birmingham, in the shape of a pair of wrought-iron gates for the principal entrance to the North-Western Bank at Liverpool. The gates measure together about 12ft. in height and 8ft. in width; every portion is from the hand of the smith or the worker in repoussé. The composition is divided vertically into four panels, which are again subdivided horizontally by enrichments of bands, upon which are elaborately worked platres. The four lower panels are squares filled in with somewhat massive scroll work and bosses. Above this are four solid panels, with representations in repoussé of floral subjects. The upper centre portion is lighter, and consists of a scroll work base in each of the four divisions, from which rise cornucopiæ and foliage, supporting repoussé heads and wings, typical of the four seasons. Over the heads is an arch of double bands, and further convolutions of foliated scrolls, into which birds are introduced. The gates close against a rich repoussé frieze, above which is a bold grill of scrollwork and foliage, supported by two griffins.

The director of the South Kensington Museum has just returned from an official visit to the museums and to the Imperial and other collections of St. Petersburg and Moscow, undertaken by desire of the Lord President of the Council, in order to ascertain what examples of gold and silver smiths' work in these collections might be reproduced, to add to the facsimile of art treasure, already at South Kensington. A selection was made of about 250 objects, ranging from goldsmiths' work of early Greek art exhumed at Kertch through mediæval times to English plate of the sixteenth and seventeenth centuries, and excellent pieces of French art of the period of Louis XV., and there appears good ground to anticipate an interesting and valuable addition to the reproductions now stored in South Kensington Museum.

A meeting was held on Monday, at the Langham Hotel, to consider the desirability of forming a Sanitary Assurance Association, "for the purpose of securing to its members, at a minimum cost, those advantages which the progress of sanitary science has made available." The chair was taken by Sir Joseph Fayrer, K.C.S.I., and the proceedings were opened by Mr. Mark H. Judge, who said that this was an attempt to bring medical men and architects together on the great question of house sanitation.—After a discussion, in which Mr. Venning, Dr. Longstaff, Mr. Chatfeild Clarke, Mr. Edwin Chadwick, C.B., and Professor Corfield took part, it was unanimously decided—"That we cordially approve the formation of the Sanitary Assurance Association; that Professor De Chaumont, F.R.S., Professor Hayter Lewis, F.R.I.B.A., Mr. H. Rutherford, Professor W. H. Corfield, M.D., Mr. George Aitchison, F.R.I.B.A., and Mr. Mark H. Judge be appointed a professional committee, with Professor Corfield as chief sanitary officer, and Mr. Judge as surveyor *pro tem.*; and that they be requested to organise the Association, and to report to a future meeting."

Mr. J. H. Parker, C.B., calls attention in the *Times* to a remarkable historical monument which has been commonly overlooked, and which Sir John Lubbock now wishes to be added to the list of those to be specially protected by law when his Act passes. This monument is the earliest Norman keep in existence, and in all probability the earliest that ever was built, the construction of the walls being of earlier character than any Norman keep in Normany itself or in Britain. It is called St. Leonard's Tower, at Malling, in Kent. This manor was given by William the Conqueror to one of his Norman followers, Gundulfus, or Gundulph; whose first object was naturally to secure an abode for himself, in which, with a small band of followers, he could be safe against any number of assailants. He was a brave man and a clever man, and an architect, and, not daunted by the danger of his position, he saw how he could secure this object. This was by building a house on an entirely new plan; the walls was built of rubble-stone, found on the spot or near at hand; the lower part was built solid, so that no battering-ram could have any effect upon it, and the doorway was 10ft from the ground, with a short ladder, which could be easily drawn up. The principal apartments were at the top of the tower, and round it was a sort of wooden gallery, technically called a *hourd*, which could be easily thrown out when wanted, and archers stationed upon this *hourd* could make it impracticable for any one to get up to the door. As soon as these arrangements were completed, a score of men could defend themselves againt any number so long as their provisions and their arrows held out. This was exactly such a house as was wanted by all the Norman settlers in Britain; it was very soon copied in all directions: the fame of Gundulph spread far and wide, and a few years afterwards he was employed by the Conqueror to build the Tower of London, a Norman keep on the same principle, only on a much larger scale, and built of good ashlar masonry instead of rubble.

STENCILLING, when used with discretion, is an admirably effective method of decorating flat surfaces at a minimum cost; but the bright colours on white grounds affected by some "decorators" should be eschewed where gaudiness is not sought after. The metal stencils usually employed add somewhat to the cost of the process, and in some cases will not lie close enough to the work to ensure sharpness. Mr. E. Leaf, of Grimsby, has sent us some specimens of stencils cut in a specially-prepared paper which may be used for work in oil, water, or distemper, without absorbing the vehicle. The stencils lie closer to the work than metal ones, and they are about a quarter the cost. Mr. Leaf informs us that he has over five thousand designs in stock, and that he is constantly adding examples in all styles by the best decorative artists. The sharpness of the stencils is especially worth notice, and their low cost has doubtless ensured a large sale.

THE directors of the Natural History Museum, in Paris, are about to take possession of the new quarters which have been constructed for them in the Rue Buffon, to replace the old buildings which literally fell into ruins, and which, besides, were insufficient for the requirements of the Institution. On the occasion of the transferment, imitating the example of private individuals, the authorities will get rid of a number of objects incapable of further use, and which are a greater inconvenience than they are worth. A good deal of interest seems to have been evoked by the announcement of the sale, though care has been taken to mention, in the particulars which have been issued, that the subjects are in a bad state.

FOLLOWING the precedent of late years, the Council of the Institution of Civil Engineers have issued, with the usual notice of the meetings for the next session, a list of subjects for papers, to which is prefaced a statement of the nature of the funds administered by the Institution available for the award of premiums to meritorious original communications. These consist of the Telford fund, now producing £260 annually; the Manby Donation, £10; the Miller Fund (exclusively for students), £150; and the Howard Bequest, producing £16 annually, and which is allowed to accumulate for five years, "for the purpose of presenting, periodically, a prize or medal to the author of a treatise on any of the uses or properties of iron, or to the inventor of some new and valuable process relating thereto." The list contains several new subjects, such, for instance, as "The Action of High Winds on Lofty and Exposed Structures"; "The measures necessary for the Relief of the Midland and Eastern Counties of England from Floods," &c. The first meeting for the session 1880-81 will be held on Tuesday, the 9th inst., at 8 p.m., when a paper by Mr. B. Walker, M. Inst. C.E., of Leeds, will be read on "Machinery for Steel-Making by the Bessemer and the Siemens Processes." Thereafter the meetings will be continued weekly, on the same day and time, until the end of May. Mr. Walker's paper will be followed by one on "The Erection of Metallic Bridges," by Mr. T. Seyrig, M.Inst.C.E., of Paris, after which a discussion will be held on "Mountain Railways," based upon papers by two Colonial members. The annual general meeting will be held on the 21st of December next.

A MEETING of the Fog and Smoke Committee, in connection with the National Health and Kyrle Societies, was held, on Wednesday, at 44, Berners-street. The chair was taken by Mr. Ernest Hart, who said he was in receipt of a large number of communications, most of them confirming statements already made to the Committee as to the burning of anthracite or smokeless coal in London. He read extracts from some of the letters, several of which, including one from Dr. Siemens, offered assistance to the Society in conducting experiments, and making practical suggestions as to the use of various kinds of grates and patent stoves. Mr. Owen Thomas offered to erect stoves for domestic use at any suitable place, and to send a couple of Welsh maids to show the Londoners how to use them, or if any manufacturer would agree to conduct an experiment, he would send a stoker. Most of the communications were referred to the Committee of Experts to deal with. Mr. Whittle stated that since the last meeting he had been further looking up the legal aspect of the matter. At present there were three Acts—viz., the Smoke Nuisance Act, the Nuisance Removal Act, and the Public Health Act, none of which went far enough completely to cope with the difficulties of the situation. The learned gentleman detailed the various processes of law that could be brought to bear, and condemned the present system, under which it was necessary that the police should take proceedings. He would suggest that the present Acts should be consolidated and extended, giving them power over a greater radius, and punishing the stoker direct, instead of the master, where convictions took place. The public ought also to be able to institute prosecutions, and half the penalty should go to the informer. At present he did not think they could deal with private houses, except by their own individual examples, and by the establishment of local committees of an Anti-smoke Association to carry on experiments.

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CHIPS.

The first stone of the Smack Boys' Home, Ramsgate, was laid by the Marchioness Conyngham on Tuesday last. The building is arranged to accommodate 60 boys. The contract is being carried out by Mr. Martin, builder, of Yalding, under the superintendence of Mr. Alfred R. Pite, architect, London.

The parish-church of St. Mary, Burnham Westgate, Norfolk, was reopened on Wednesday week after complete restoration. The chancel has been partially rebuilt; there are new Minton tile pavement, east window, roof, carved oak seats, and other fittings. The nave and aisles have been repaved with Minton's tiles, and furnished with substantial open seats of pitch-pine, and carved oak pulpit and reading-desk, and additional windows. Lighting is by oil-lamps, suspended from the roof. All the stone-work has been repaired. The old chapel of St. John has been restored, and fitted with open seats, a new roof of lead put on, and the chapel opened out to the north aisle. Mr. R. M. Phipson, of Norwich, was the architect; and Messrs. Dein, of Burnham, were the builders. It is proposed to restore the tower and porch when funds permit.

A new Wesleyan school-chapel in Sutton Court-road, Turnham Green, was opened on Tuesday. It is Gothic in character, and is built of brick with stone facings, and the roof is of slate, in blue and green bands. The chapel measures 56ft. by 36ft., and 28ft. high; half the floor space is pewed, and the rest furnished with movable seats with reversible backs; the roof is open. A gallery, 15ft. by 36ft., is provided for infants, and there are two class-rooms. Mr. J. Coverdale Bilton, of Gunnersbury, was the architect, and Mr. H. G. Whitman, of Turnham Green, the contractor.

The foundation-stone of the first portion of a permanent church of St. Paul was laid at Swindon by Lady Gooch on Thursday in last week. The church will eventually accommodate about 800 persons, and, together with parsonage, will cost £10,000. The contract for the first section has been taken by Mr. W. Jones, of Gloucester, at £3,600. Mr. Edmund B. Ferrey, of Spring-gardens, London, is the architect.

A window of three lights at Newington parish-church, East Kent, has been filled with stained glass by Messrs. Heaton, Butler, and Bayne, of Garrick-street, London. The subject is the "Nativity."

A new district hospital dispensary was opened at Shepton Mallet on Saturday. It is situate in the Waterloo-street, is in the Gothic style, and contains four wards, containing 12 beds. Mr. G. J. Skipper is the architect, and Messrs. J. and S. Emery, of Shepton Mallet, the contractors; the cost has been £2,000.

At a special meeting of the select vestry of Richmond, Surrey, held on Tuesday week, a joint letter of resignation, signed by all the members of the water supply committee, was received, owing to difficulties in connection with the proposed new well. It was decided to refer the whole question to the opinion of some eminent engineer to be hereafter selected by the vestry.

A stained-glass three-light window has just been placed in the aisle of Crawley Church, Sussex, to the memory of the late Mark Lemon.

An extension of the East Norfolk line of railway from Cawston to Reepham has been let to Mr. Waddell, and the contract for the station at the latter village has been taken by Mr. Bennett, of Downham Market.

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THE BUILDING NEWS.

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LONDON, FRIDAY, NOVEMBER 12, 1880.

THE REQUISITES FOR A LIVING STYLE.

IT is possible for genuine architecture to exist even in times and places where there is no living style. No one, for instance, can look at Wren's City churches, and especially at their towers, and then honestly deny that they are real works of architecture, bearing, in many cases, the strongest marks of original genius. Living style, on the other hand, they have none, unless it be in such things as a bit of post-Mediæval ironwork, and a fragment of carving by Gibbons or some one of his school. Their detail, observed closely, is a mere poverty-stricken imitation of Classic—though, seen from a distance, it all fits into its place and plays exactly that part, in bringing out the general scheme, which the great composer designed it for. Wren, in short, was the very opposite of many modern Gothic revivalists. His works, in their inmost essence, are Gothic, Romantic, picturesque, and it is only their detail which is formal and Classic. Their works, on the contrary, are often formal enough in plan and feeling, and it is only their detail which is Mediæval. This detail, indeed, is far from being in all cases as tame as it is sometimes said to be. Not a little of it might stand, undisgraced, beside detail of the 13th or 14th centuries, and prove itself, if only a copy, at least a copy made with something like spirit, appreciation, and delight. But, in spite of all the care that, for the last 40 years, has been given to detail, living style we have none. There is some reason to think that at the present moment we may be nearer to having one than we have hitherto been: but the the whole course of architecture through the last half-century shows that the possession has not been ours as yet. The distinction of a living style is that it grows: not that one variety of style after another is tried and suddenly abandoned. It is the latter process, not the former, which has thus far marked the history of the Gothic revival. At its commencement it followed, most frequently, the Perpendicular style; renouncing this, it afterwards adopted, in its most successful works, Early English and Geometrical: then it ransacked the Continent for Italian, Venetian, and French Gothic; and now, coming home again, it has taken up with what was once set down as "Debased," or semi-Classic. There is no growth in this, for growth implies gradual modification; it is a mere digging up of one flower, and a substitution, at short intervals, of another and another. The first requisite, in such a state as this, is not to observe what points of detail are successful and to perfect them, but to forget as fast as possible those that have become unfashionable, and to learn, as quickly as may be, the way in which architects *à la mode* are "making things" now.

It is not absolutely necessary to a living style that it should be universal in the time and place where it is found. There were times and places in Spain where Romanesque and Gothic, and Moorish in some of its forms, were both living styles together. One set of men were building in the one style, and another set of men in the other; but both styles were growing and flourishing simultaneously. This, of course, was an exceptional case: and it shows that architecture—even the most real and genuine—is something more than a mere outgrowth of physical conditions. The physical conditions were alike for the Gothic and the Moorish builders: they had the same climate, the same building materials, and in many cases, no doubt, the same structural knowledge; yet, though neighbours and contemporaries, they chose to build in two very different ways. Shall we say that, since these two ways could not both be the best under the given circumstances, that one of them ought to have been suppressed? And shall we wish in our own times, if not for such a rough-and-ready measure as an architectural Act of Uniformity, at least for the uniformity which all parties, artistic as well as religious and political, are apt to hope for—the uniformity which will result when all the world is converted to our own particular way of thinking? Alas! to gain such a uniformity we must first conquer human nature, and next must overcome what is stronger than human nature itself, that is—Time. For, if men would have uniformity, Time will have none of it. The men of one generation in the same country may conceivably think alike in art matters; such a thing has been, and perhaps might be again. But the men of successive generations, even in the same town or village, will never think alike. In China itself there is a difference between the art-forms of different centuries, much more where men "look before and after, and sigh for what is not." But the work of the past lasts down to, and stands amongst the work of the present; and the work of the present will, much of it, stand side by side with the work of the future. If we could attain uniformity of architectural practice to-morrow, that would not make our streets uniform. If we could get all our contemporaries to agree, we should be no nearer to bringing our ancestors into the arrangement. Their works would still stand out as irreconcileable as ever, and our own works, in a century or so, would themselves break up the uniformity of that future day.

A visible uniformity of style in our street architecture, then, is a thing which we never need hope to see. It is a thing which could only exist in a town built all at once, and ceasing to flourish thenceforth and for ever. It is a thing which would go along with grassgrown streets and silent pavements, and that absence of voluntary change which everywhere means death. Yet, at the bottom of the desire for uniformity of architectural practice, there is a great deal of most important truth. Architecture, unlike easel-painting and poetry, is, or ought to be, a co-operative art. To make the very best of a large architectural work, many artists are needed; for the details give opportunity for more thought, more invention, more design, than one man is well able to lavish upon them. In general composition, indeed, one man, the head architect, as we may call him, should have it all his own way; and Wren's works, to name no others, show us that a true architect is quite able, unaided and alone, to do great and permanently successful things in the planning and grouping which constitute architecture proper. In the case of detail it is very different; and architectural style is mainly an affair of detail. To speak more accurately, the labour of evolving an architectural style is a labour chiefly concerned with details. The keynote of the style is struck by some one man, probably far above his fellows in foresight and penetration; and then they, in their subordinate places, spend their lives in bringing every minor feature into harmony with this ruling note. So it seems to have been at the origin of the Pointed style. Its keynote was the pointed cross-vault; and at first this appeared in the midst of elaborate Romanesque detail. The main arches soon began to follow in shape the crossrib of the groining; and by slow degrees the minor arches, down to the smallest, took upon themselves the same form. It is needless to indicate the way in which every other feature—from towers and spires down to mouldings and sculpture, all went through a corresponding change—till, by the middle of the 13th century, there was hardly a detail in any new building of the same general character as in the middle of the 12th. We seldom realise, in these days of hurry and thoughtlessness, the almost infinite amount of original invention which, in that one century, was brought to bear on architectural problems. All those details, which we copy so freely—and to copy which with anything like spirit and accuracy, is almost enough to make a modern architect's reputation—were once original ideas, produced by some hard thinker or another after years of earnest observation and experiment. Everybody knows this, but hardly any one seems to realise it. We look on the past styles, be they Gothic or Greek, or Oriental, as if they grew up with no more human aid than the pine-forests we make our floors and roofs of; or, if we recognise that they were created by voluntary agents at all, we feel like the modern Arabs, who believe that the monuments of Egypt were raised not by men, but by the genii of the "Arabian Nights."

The mistake of the Arabs is, at bottom, much the same mistake that is made by the moderns generally, when they consider the past successes of architecture; both alike forget what can be done by time and by combination. The solitary Bedouin sees clearly enough that he alone could never build a pyramid; he sees that thousands of men could not do it unless they worked at it for a lifetime; and he cannot conceive of any power which could bring so many men together for such a purpose and keep them there so long. So the solitary architect knows very well that he could not develop a style, and invent, even were life ten times as long as it is, the countless details, all in perfect harmony, which go to make one. He looks back to his favourite era of living art, and says despairingly, "There were giants in those days." Yet the men who reared the pyramids were no stronger in body, and, in all probability, the men who invented the highest styles of the past were no stronger in mind, than men are now. The secret was, that they worked together, and took as long over their work as was needed to do it well. This is the great advantage of uniformity in style: that it enables architects to work together and to avail themselves of each other's improvements! As long as each architect tries his best to invent a manner of his own and keep it to himself, the first step towards the development of a living style cannot be taken. He can borrow nothing from others that will harmonise with his work; he can lend nothing to others that will harmonise with theirs. No doubt there is plenty of borrowing traceable at present: but it is just the fact of its being so easily traceable that shows it to be borrowing of the wrong sort. The workers in every living style would seem, indeed, to have had all things in common. Every fresh solution of a problem—no matter who deserved the honour of it—was speedily at the service of everybody else. But, under those conditions, everybody else could use it, and use it to the improvement of their work, because all were looking in the same direction, composing in the same key. The style was thus enriched and added to by the best thoughts of hundreds of able men: its secrets were too widely known to be lost by the death of their first discoverers; and so it went on transforming, perfecting, and slowly modifying itself from generation to generation. Just the opposite of all this happens when every architect tries to patent a style of his own. Except so far as it is a repetition of some ancient style, first developed by the means just noted, it contains the thoughts of only one man; and even these thoughts, few and hurried as they are likely to be, are of no use to other workers in the same province. The consequence is that an individual manner like this ends as it began, with the man who produced it. No matter how able and industrious he may be, it will be a poor style, since it holds no new thoughts but his own; and were it as admirable as it is likely to be unsatisfactory, the world must lose it, for it cannot outlast him.

At the present moment it may be safely said that there is more architectural knowledge, and even skill, in England than there has been at any time since the fall of the Mediæval system. The misfortune is that the owners of this knowledge and skill are not an army but a mob. Instead of advancing together in wisely-planned order against the enormous difficulties which architecture now has to deal with, they fight every man for his own hand. Or, to change the figure, instead of all uniting to raise a "starry-pointing pyramid" outlasting the ages, each one is content to heap up his own little cairn of stones—to be levelled, perhaps, by the first ass's heel that may chance to pass that way. For the sake of art, and for the sake of architects, combination is the most urgent want of the day. There is ability enough around us to do great things, if that ability were only concentrated, instead of being scattered on all sorts of discordant objects. Architecture, as we said before, is a co-operative art. No one man is great enough to make a style by himself, although he may be great enough to produce distinguished works in that style when it has once been formed. This is the true line for personal ambition. Unity in style does not prevent individuality in design, any more than the use of a national language prevents individuality in ideas. On the contrary, it promotes it, by taking away the thin disguises under which old thoughts are passed upon the world over and over again as something fresh. The same worn-out plan or elevation, ill-fitted, perhaps, at first for the wants of our time, is sent forth now in an Early Gothic dress—now in a Late Gothic one—now in semi-Classic—and now in stiffly-starched Italian; and non-professional critics, though they feel there is something wrong, do not recognise that they have been hearing the same old tale, time after time, in different languages. Keep to one language, and the trick would be exploded; thoughts would be in demand, since words would then no longer serve. Co-operation in style, again, would do something to remedy that want of time which, as we saw not long ago, is one of the greatest difficulties which architects now have to contend with. The general scheme and composition of a building once settled by the head architect, many of its details might be worked out by subordinate architects, equally at home in the common style. Every large building would thus get the thoughts of many men, each competent to do something harmonious and interesting, if not great; and we should have the best parallel which present conditions allow to the manner of working which prevailed on the great buildings of the Middle Ages.

But what hope, or what possibility is there, it will immediately be asked, of getting all modern architects thus to think alike in the matter of style? No hope and no possibility at all, we answer, of getting all, or even a majority, to unite in this way. We have seen, however, from the case of Mediæval Spain, that a style may be living and growing while it is far from universal. If a sufficient number of competent men will join to work in the same direction, it matters little how many or how few outsiders there may be who refuse to aid them. It is far better, indeed, that those should not join who could not, or would not, work earnestly in the agreed direction. Let them, if they will, unite amongst themselves and try to make progress in the path to which their taste naturally lead them. Once united, they will give up by degrees many crotchets and learn many truths which as individuals they would never have lost or gained. It is not, after all, a matter of such unspeakable importance what type of architecture may be fixed on as a starting-point; the great thing is to get a sufficient number of able men to keep resolutely and harmoniously at work on one type, whatever it is, so as to adapt it, in an artistic way, to modern needs. All through this century, architects have been hesitating and debating as to what style they should start from. Every mode of working which Europe has seen, from that of the age of Pericles to that of the time of Queen Anne, has been praised, condemned, recommended, and abused by turns; no mode has been seriously taken up as a basis for combined effort, though all modes, one after the other, have had a multitude of isolated copyists. The admirers of each, apparently, have been waiting to convert the admirers of all the rest, and have thought it premature to make the first move till everybody, all through the kingdom, should be ready to join them. It would be much grander, no doubt, if we could all march off together; but as that striking event is not likely to happen at present, might it not, after all, be best if the few dozen who happen in the main to think alike, were to start by themselves as soon as possible? We have seen what comes of isolation in architecture; but England has not seen for centuries what may be done by combination—even the combination of a few.

SCIENTIFIC FENESTRATION.

SCIENTIFIC fenestration, that is, the ascertainment of a trustworthy rule to regulate the forms and dimensions of windows, and their number and position, in relation to the light required in the interiors of buildings for various purposes, is a matter of almost insuperable difficulty. The textbooks of architecture, indeed, say that nothing seems so much to disallow of general law; and, in default thereof, the architect is usually advised to err on the side of providing an excess of light, because it is always easier afterwards to diminish than to increase it. Although the difficulty is thus got over in a rough-and-ready, practical way, a certain rule would be none the less valuable, if it were only to supply an admitted deficiency in architectural science. But the subject assumes very much higher importance when we are assured by all the eminent physicians of the day that defective eyesight is largely on the increase among the people of this and other countries, and that, among other causes, the most powerful and most clearly ascertained is the commonly injurious arrangement of the window-lights in rooms wherein we live and work. These remarks apply more particularly to schoolrooms, and the impetus which the educational movement has lately received has attracted increased attention to the matter. While it is found that short-sightedness (*myopia*), dimness of sight (*amblyopia*), and weakness of sight (*asthenopia*) are increasing generally in Germany, Russia, America, and England, in proportion as the children of those countries are compelled to attend school for a certain number of years (for statistics see a paper on "School Hygiene," by Dr. F. F. Lincoln, of Boston, Mass., in Dr. Buck's recent "Treatise on Hygiene and Public Health," Vol. II., pp. 605, 606), we are assured, at the same time, that the percentage is much greater in schools where defective window arrangements prevail, than in others; and there can be no doubt that the same causes produce similar results, although in less degree, from the greater sensitiveness of the eye in childhood, in buildings for adults. Perfect vision is, in fact, a rarer blessing than those who enjoy it are apt to suppose; and those who have it not fail to realise how much of the defect is due to an imperfect regulation of the light by which they work. Excess or deficiency of light, cross lights, light falling at an improper angle, and light reflecting various colours, are all, in their degree, more or less injurious to the eyes, and it is the business of the architect to get as near an approximation to a certain rule as possible (we confess at the outset that an absolutely certain rule has not, as yet, been devised), to illuminate his buildings so as to provide against all these. The light admitted into our buildings requires regulation in three main respects, viz.:—(1) Quantity; (2) Angle of incidence; (3) Quality.

(1) *The Quantity of Light.*—The main difficulty in regulating this arises from the variations of natural light itself. Artificial light can be always exactly measured and regulated. It is a well-ascertained law that the illuminating power emanating from any source of artificial light always diminishes in intensity exactly as the square of the distance from the source of light increases; and hence, we can always regulate the quantity which shall fall upon an apartment, or any part of an apartment, from any given number of sources, and by the very simplest means, we can also regulate its quantity and its angle of incidence. But not so with natural light. Practically speaking, all points of the earth's surface are at an equal distance from the source of light, the Sun. In the open air, the quantity of light is diminished only by shadows, such as those of clouds, trees, or buildings, and by vapours in the atmosphere; and it is seemingly increased by reflection, and by the apparent height of the sun in the sky, according to which it must pass through a greater or less thickness of the atmosphere, which absorbs a part of the light in proportion to itself, and leaves a greater or less quantity to fall upon a given spot. The light falling directly upon every spot is thus a quantity varying with the sun's course in the heavens at every moment of the day; and this fact renders any rule founded upon the direct light of the sun absolutely impossible. But an average law is not equally impossible. The atmosphere is, in itself, a great reservoir (so to speak) of light, absorbing a comparatively small portion as it comes from the sun, and radiating the rest in every direction. Hence a sufficient approximation to a general law may be attained by assuming the sky (that is, strictly speaking, the atmosphere) to be a hemisphere, uniformly illuminated in all its parts, and then calculating how much of its light will enter an aperture of given dimensions, and in a given situation.

The very best light possible has been proved, experimentally, to be that derived from a horizontal skylight, or from a simple aperture in the roof. The reason for this is, that the light is poured into the apartment from every part of the great natural hemisphere of light by which it is surrounded no appreciable quantity being lost by absorption, reflection, or refraction. A crucial example of the efficiency of this mode of lighting is found in the Pantheon at Rome. This ancient building has a clear internal diameter of 142ft. 6in., with a height of 74ft. to the springing of the semicircular dome, and may, therefore, be taken, in round numbers, to inclose a space of about 1,934,460 cubic feet. But the whole of this vast space is most efficiently lighted by one single aperture in the crown of the dome (commonly called the eye) which is only 27ft. in diameter, and has, therefore, an area only of a little above 572ft.; whence it follows, that each superficial foot of this aperture efficiently illuminates no less than about 3,480 cubic feet of space. Apart from all considerations of climate, this one example clearly shows the wonderful superiority of vertical illumination where it is possible. But this kind of window is possible only to a very limited extent. In most cases, light has to be admitted through windows in vertical walls. In considering the quantity of light such windows will admit, it is, of course, necessary to treat the question, in the first instance, as if an entirely unobstructed space were in front of the aperture, and to leave the effect of obstructions for after-treatment. Now, it is found that the rays of light which enter such an aperture are very considerably modified by the degree of obliquity with which they strike upon its surface; or, what is the same thing, by the angular distance between the horizon and the zenith from which they proceed. A ray, for example, that strikes horizontally on a window, as in the case of the sun rising or setting exactly opposite to it, will arrive at the far end of the interior with the same degree of intensity with which it leaves the glass, so far as we can appreciate it by our sensations. But, on the other hand, rays that proceed from near the zenith strike the surface of the window very obliquely, and with a very great diminution of illuminating effect. The reason of this is, that the breadth of a beam of light entering horizontally is fully equal to that of the aperture, and it, therefore, loses none of its illuminating effect; but the breadth of an oblique beam—and, therefore, its illuminating effect, is diminished in proportion *to the sine of the angle at which its rays are inclined to the aperture.* When the angle is small, its sine is small, and the lighting power is, therefore, insignificant. The angle at which a beam of light falls upon a perpendicular aperture is thus the measure of its illuminating power, and this has been computed with considerable exactness, as shown in the following table:

RELATIVE ILLUMINATING EFFECTS OF EVERY TEN DEGREES OF SKY MEASURED FROM THE ZENITH.

Arcs of 10° each.	Number of rays out of every 100 which the aperture receives from each arc.
Between 90° and 80°	1·5
,, 80 ,, 70	4·5
,, 70 ,, 60	7·0
,, 60 ,, 50	10·0
,, 50 ,, 40	13·0
,, 40 ,, 30	14·0
,, 30 ,, 20	16·0
,, 20 ,, 10	17·0
,, 10 ,, 0	17·0

In estimating the quantity of light received from a given arc of the sky, according to this table, it must be borne in mind that all those *above* it are to be added to it. Thus the light received at from 70° to 60° = 7 + 4·5 + 1·5 = 13, and that from 10° to 0° = 100. But these principles and computations are more useful in calculating the question of the effect of artificial obscurations of light, than for establishing the rule of which we are in quest.

If we take the average size of windows practically constructed in most London houses, we shall find, as a common enough example, in an ordinary room, say 20ft. by 15ft., lighted by two windows of ordinary height, 3ft. wide in the glass, with the light received at an angle of 45° all along the front, indefinitely (for example, a ground-floor window in a street whose width equals the height of the houses), that the amount of light is barely sufficient for ordinary residential purposes, and this, therefore, is, according to the *dictum* of Professor Kerr, an instance of the *standard minimum of necessary lighting.* Proceeding from this point, and taking as standard conditions that the sill of a window is about 2½ft. from the floor, and the head about 1ft. from the ceiling, Professor Kerr suggests the following scale of widths of window-space with corresponding dimensions of rooms at random proportions, heights being immaterial, and the angle of light being in all cases 45°, as a minimum of domestic light:—

Total window space	3ft. wide;	room	12ft.	by	12½ft.
,,	4 ,,	,,	16	,,	12½ft.
,,	5 ,,	,,	17	,,	14½ft.
,,	6 ,,	,,	20	,,	15ft.
,,	8 ,,	,,	20	,,	20ft.
,,	10 ,,	,,	25	,,	20ft.
,,	12 ,,	,,	30	,,	20ft.

That is to say, in ordinary cases about 1ft. of window-width (of standard height) to 50 superficial feet of floor, with the lighting intercepted at 45° along the front indefinitely. Professor Kerr adds that it seems of little moment what may be the shape of the room or the position of the windows, and in this we hardly agree with him. Every ray of light that enters an apartment is deflected from its path by entering, and again by leaving the glass of the window, and for this reason a much larger quantity enters the part of the room nearest the window, than reaches the farthest part of the room, and this quantity is in a great degree in proportion both to the size of the window and the position of the observer. Hence we naturally move our book or paper nearer to the window as daylight diminishes. If the problem be as it really is, how to illuminate the apartment uniformly, that is from near the window to the farthest point from it, at the usual height of an observer's eye, seated or standing, say, from 3ft. to 5ft. 6in., we find the position and shape of the windows of great importance. Rays cast from below the level of the eye, as from a window near the floor, not only strike upward to the ceiling and fail to light the room perfectly, but are positively injurious to the organs of vision. If anyone wish to test this, let him only try to read with a lamp placed on the floor. The eyes of mankind are constructed with brows and eyelids to shade them from above, whence light naturally comes, but none to shade them from below. By all means, therefore, let no windows be made down to the floor, but always from 2½ft. to 3ft. from it at the least. In rooms where it is not desired to look out from the window, even a greater height would be as well. The best light is always that which comes in from near the ceiling. Artists prefer to work by a light from the perpendicular part of a lantern in the roof, and this is also the best light for picture-galleries and museums. These two facts, viz., that the worst light is from the bottom of a window, and the best from the top, lead us to a principle as to shape. If we compare two windows, each containing, say, 40ft. superficial of glass, the one 15ft. high by 2ft. 8in. wide, and the other 10ft. high by 4ft. wide, one might suppose the illuminating effect to be the same. But it is not so. The first window would reach from the floor to the ceiling, the second from the ceiling to within 3ft. or 4ft. of the floor. Now, all the light below this level in the first window is practically wasted, and the second admits more useful light in the proportion of 40 to 28·6.

In the case of an apartment, long as compared with its width, it is found in practice that it is more effectually lighted by windows at either of the narrow ends than if the same area of light were admitted on either of the long sides, and most especially so, if it should happen that on such long side there be a pier, instead of a window in the centre of such side. In illustration of this we quote, from Gwilt, the example of the ball-room at Windsor Castle, 90ft. long, 34ft. wide, and 33ft. high. This room is lighted from the northern narrower side by a window nearly occupying the width, and is supplied with an abundance of light. But had the same quantity been admitted from either of the long sides of the room, so many masses of shadow would have been introduced through the interposition of piers, that its effect would have differed most widely from the cheerful and airy aspect it now presents. In default of an absolute ascertained law of proportion between the sizes of windows, and the area of apartments, certain rules have been framed from experience. The practice in ordinary London houses we have just mentioned; the practice of Sir Wm. Chambers was to add the depth and width of the rooms, and take one-eighth part of the result for the width of the window, and Gwilt prescribes 1ft. superficial in a vertical wall for 100 cubic feet, if the light be placed centrally in a square room, and the building is free from obstructions. Another rule has also been given in the following words:—"Multiply the length and breadth of the room together, and that product multiply by the height, and the square root of that sum will be the area or superficial contents of the light required." These are the nearest approximations to a rule yet made, and though practically useful, we have not been unwilling to point out some of the points and difficulties in the way of attaining more completeness, and to set our readers on the task of investigating, and, perhaps, largely assisting in the solution of, a very interesting problem.

The subject of scientific fenestration, however, includes much more than a mere regulation of the quantity of light. Its angle and direction are of great consequence to the comfort of the worker and the preservation of his eyesight; and this is a matter wherein the architect and physician should work hand in hand, each learning the other's requirements and appreciating each other's difficulties, so as to arrive at the maximum of possible adaptation of our buildings to the delicate organs of human vision. Space, however, fails us to enter fully into all the wide bearings of this subject, and for the present we must confine ourselves to reproducing for the consideration of our readers, the latest statement of the requirements of the medical profession in relation to the architecture of windows. Though primarily addressed to the architects of schools, they embody principles adapted to all buildings where men live and work. We compile principally from a valuable paper on "School Hygiene," written by Dr. D. F. Lincoln, of Boston, in the United States. A scholar must have a perfect light in whatever part of the room he sits. The requisites to this end are as follows:—

The sill had better be placed 4ft. above the floor. Light entering at the level of the eyes only dazzles, and is almost useless for illuminating the tops of desks. Make the interior of the room pleasant, and the pupils will not want to look out of the window. The top of the window must come as near as possible to the ceiling. By the use of iron girders it can be brought within 8in. of it, and this should be required. The reason for this requisition is that the most useful light for a scholar's purpose is that which strikes his desk at a right angle or something near it. This is furnished, first, by the upper part of the windows; and second, by the ceiling; hence the propriety of using every means to secure the thorough illumination of the latter—a point which is neglected in most dwelling-houses, churches, and schools. Evidently the heads of the windows must be square, and not rounded or pointed, as is the case in certain picturesque styles of architecture. Neither is a pier of masonry dividing a window desirable. The roof must not project so as to cut off any appreciable light, nor are verandas at all allowable in the quarter whence light is supplied. There must be no wing or projection, no pier or column, in the way of light. These restrictions set a limit to the indulgence of the architect's taste; but they leave room enough within the limit. If projections are forbidden, flat decoration and ornamental brickwork are admitted; and shafts, wide doors, and groups of windows are features which can be seized upon to give a characteristic style to the building, which need be neither ecclesiastical, Hellenic, nor commercial.

The proper position of the windows is tolerably well settled. No window should be placed in front of the scholar, for the light thus entering is worse than wasted, blinding him at his work, and tending directly to produce near sight. Windows on the right are slightly objectionable, as throwing a shadow on the page whenever the hand is used in ciphering, drawing, or writing. Windows at the back throw the pupil's own shadow on his book; but this is not a serious matter, except for those who sit next a window, and they have light enough, at any rate, while for writing they are extremely well-placed, as it is usual to turn partly to the left in this exercise. Windows at the left are entirely free from objection, as far as they can be free. The ideal light should come from over the left shoulder, or the right shoulder if one is sitting up and reading; but if looking over a desk, this is rather inconvenient, and the best is then a very high light from the left, and a little in front. In brief, the rule for placing windows is: *never* in front, *always* on the left; at the back also, if you choose; but not at the right, if you can help it. Light from the left and the back at once does not harm the eye, and practically is quite admissible; the only person to find fault is the teacher, in whose eyes the light will fall directly.

The German authorities agree substantially with these remarks, though they differ among each other in the degree of emphasis with which they forbid the rear and right-hand windows. Dr. Erissmann says emphatically: "The light must be taken from the left side only. A room which cannot be sufficiently lighted from that side is unfit for a schoolroom." English schools are peculiar; and, from the shape of the rooms and the presence of galleries, are often hard to light.

The size of the windows, taken collectively, should equal, at least, one-sixth of the floor-space. Cohn requires one-fifth, or 30in. to the foot. Less than this will probably be insufficient in many cases. It is also stated by the highest authorities in school hygiene that 300 or 350 square inches of glass are required for each pupil, and this requirement is nearly coincident with Cohn's in the German schoolrooms, which hardly exceed 7 metres in depth. In those of greater depth, it would not be nearly enough.

RESTORATIONS AT HAMPTON COURT PALACE.

HAMPTON COURT PALACE has recently undergone restoration, and during the past year or more we find considerable progress has been made. Visitors must have previously observed that decay had commenced in many of the buildings; the brickwork needed repair and repointing, the parapets were in a dilapidated condition, and the stonework and carvings were in many instances in a crumbling, obliterated, and insecure condition. Closer inspection revealed the inroads time and negligence had made, and the Government authorities in charge of the Palace commenced the work of repair not a day before it was necessary. Under the architect of the Office of Works, Mr. J. Lessels, and under the immediate superintendence of the resident clerk of the works, Mr. Edwin Chart, to whom we are indebted for particulars, the restorations of the principal internal courts and façades have now assumed something like completeness, though there still remains a good deal to be done.

The three great courts of the Palace have all undergone careful examination and repair, though little has yet been done to the main entrance of the western façade, the old gateway of which still retains its miserable plastered and whitewashed ceiling and walls, a sorry entrance to so grand a group of buildings. It is worthy of remark that in the eastern angles of the gateway, shafts, with their springers, yet remain, indicating that this gateway must originally have been groined. We hope that very shortly the interior will receive attention, and that the poverty-stricken look which at present pervades the entrance—due, no doubt, to some 18th century plasterer—will give place to a groined ceiling and to brick-faced walls, in harmony with the rest of the front. Entering the kitchen-court, the visitor will be much pleased to find the old and decayed chimneys and brickwork have been here and there reinstated. This court is perhaps unique as a specimen of picturesque grouping, the semicircular bay window of the drawing-room, the play of light and shade, and the square-headed mullion windows, grey with age, the whole set off by the sombre and mellow colouring of the brickwork, produce an effect only realised in works of Tudor architecture. The Fish Court is another piquant bit of old work; the decayed walls have been restored to harmonise with the ancient portions, and the manner in which the old chimneys have been reproduced may be seen by the admirable restitution of the cut and rubbed brick chimney-shafts in Seymour's Court, in which elaborate chevron and honeycomb patterns have been executed.

Tennis-Court Lane, on the north side, retains its ancient character, though here the archæologist may observe a blending of modern with old that will repay observation. The insertions of flat-gauged arches of red brick, with white painted window-frames and sashes, show that considerable additions were made to this part of the palace in the 17th century; but of course the most interesting parts are the Gothic, of which several fragments of good bays and chimneys yet remain. Little has been done here, but, we understand from Mr. Chart, this portion will be taken in hand in due time, and the decayed stone mullions, string-courses, and chimneys made good.

The West Court preserves, probably, the original appearance it possessed in Wolsey's time more than any other. It is a large quadrangle, and possesses the quiet, hospitable air so characteristic, also, of genuine Tudor times. The surrounding buildings are of two stories, pierced by the typical three-light square-headed mullion windows, and surmounted by a lofty parapet battlemented. Recent restorations here compare most favourably with those undertaken about 30 years ago, as may be seen on looking at the coloured brick parapet on the north-west angle, and the new brickwork lately executed. The gable of the great hall, seen here to advantage, has been undergoing much-needed repair; we find new gurgoyles have replaced the old ones, which were dangerously decayed, and the griffins up the copings have been renewed by Mr. Ruddock, of Pimlico, who has executed the whole of this work in a thorough manner, following closely the original freestone models.

We now come to the second gateway, which leads to another, though smaller, quadrangle called the Clock Court. Here the visitor will find that the elaborate fan-groined ceiling, about 18ft. square, which covered the lobby at the foot of the great hall staircase, has been restored. The old ceiling to the gateway had so far decayed as to be dangerous to those who entered, and the ribs and cuspings were crumbling away. We find, on examining the new ceiling, that the old one has been conscientiously followed, the ribs and details having been scrupulously reproduced. There appears to be little doubt that this gateway belonged to the age of Cardinal Wolsey or Henry VIII., as on a close inspection of it we find the usual heraldic badges, the Tudor rose, Fleur-de-Lys, portcullis, the initials of Anne Bolyn in the quatrefoils of the panel. The centre forming the keystone is carved as a large Tudor rose of bold proportions, and Mr. Ruddock has carried out this important part of the restoration in a very satisfactory manner. The ribs and tracery are sharply cut, and the ceiling is carried out in Bath stone. The walls of the staircase leading to the great hall have been restored to their original state, the plastering has been removed, and the walls refaced with new red brickwork, in addition to which the ceiling has been repaired and trussed beams introduced across the staircase. The quadrangle which forms the second from the entrance is about 134ft. square; the hall forms the north side. The most important feature in this court is the astronomical clock, said to have been erected in 1540, which has lately undergone renovation, and has been described in the BUILDING NEWS. Its face is a series of concentric circles, having the signs of the Zodiac and various other devices. The eastern front shows traces of Classical work, and it is said that Kent was employed to restore it, the date 1732 appearing. The pseudo-Gothic, or rather Batty Langley details, the window with ogee arch mould, are striking anachronisms, and we should not be sorry to see these unsightly innovations removed.

Passing through to the court known as the Inner or Fountain-court, in which the work of Wolsey and his successors has given place to the fine Classic buildings and cloisters of Wren, we perceive that considerable renovations have been made. On one of the sides the attic has been restored, the new red brickwork of which has been made to harmonise with the time-stained walls. This attic is pierced with square-shaped openings, surrounded by stone architraves, and surmounts the circular or bull's-eye windows, over the lofty range of pedimented windows. From the range of circular openings it is divided by a deep stone string. To the admirer of the Italian revival, this court claims attention, and possesses much that is striking, if not grand. The circular arches forming the arcade of the cloisters are particularly noticeable for their drop arches carved in front, and for the decorative carving round the bull's-eye openings, which latter is a clever conventional adaptation of the flayed lion's skin, the head forming the key-stone. The west side is the Mantegna Gallery. The fountain still remains, but the statuary of Fanelli are absent. The cloisters themselves have been restored, the walls have been refaced with red brick, and the stone pilasters carrying the groining have been rebuilt here and there.

In the Chapel Court, one of the battlemented parapets has been rebuilt, and some brick shafts added, in character with the old. Of the roofs, covering three or four acres, much has been releaded in a substantial manner.

The sanitary arrangements have undergone reconstruction also; we hear that all drains and closets have been cut off from the sewers, and the soil and discharge-pipes have been left open at the top without the addition of any offensive cowls or terminals. A new engine-house has been built in a shrubbery at the north side of the garden-front of the palace, and the architect has successfully endeavoured to make it harmonise in stylo with the later Tudor buildings. It is a square erection of red brick relieved by mullioned windows of stone, covered with a nicely-toned tile roof, out of which springs a ventilator, of good design, constructed on the deflecting-plate principle.

SCULPTURAL DECORATION.

IT is a common reproach that we have no sculpture worthy of the age; and certainly if we look to recent buildings for evidences of the decorative sculptor's art, we are obliged to acknowledge that there is some ground for that opinion. The most obvious defect in decorative work of this kind is that it lacks character. There is no school; but what is done is copied from some old building, or is the crude attempt to carry out a design that has been drawn in outline, but never modelled. If it is a bas-relief, there is a flatness and want of salience to certain figures or groups; if a figure from the round, the material has not been sufficiently considered. These faults spring from the absence of modelling, also the tendency just now to teach our artists from the flat instead of from the round. The outline, important as it is, does not fairly represent the appearance of a design which is raised in relief, much less does it present the isolated figure from the round divested of all background, and subject to the ever-changing effects of light and shade. In works of modelling and sculpture, we find the modern artist sometimes totally forgetful of the material he is using. To take one glaring instance of this, it is not uncommon to find bronze treated in precisely the same way as stone. The substance and durability demanded by the latter material are copied in the bronze statue or group, notwithstanding the very different qualities of the material. In dealing with bronze, the artist is not called upon to give support to limbs or drapery as he would in a brittle fragile material; he can display more *tour de force*, as in a poised figure of Mercury. On the other hand, good outline is more necessary in a bronze than a stone group; the contour is everything in a dark material, which receives no aid from light and shadow half-tints, and gradation of tone. The late Professor Weekes, R.A., has, in his recently-published lectures, inculcated this principle. He says a work of bronze has to depend almost wholly upon what is termed its sky-line; "the idea must be expressed by what we understand by the word silhouette—that is, a marginal line or contour filled up by blank space, with all inner forms omitted. This arises from the dark colour of bronze hiding the inner details, so much so that in certain lights they become, in large works seen from a distance, almost invisible." He goes on to show that many compositions well-suited to marble are quite unfit for bronze, as, for instance, draped figures sitting in chairs, where the outline is obscured or lost. The statue of Havelock, in Trafalgar-square, is condemned for having at its back a tree for the purpose of support. Such subjects as Apollo, Hercules, the embraces of a Cupid and a Psyche, naturally approve themselves to the artist as being suited to bronze more than to marble. Flaxman again has given the sound advice that "attention to the materials of sculpture will naturally lead us to the selection of its legitimate subjects." When much animation is not wanted, where the dominant emotion is a dignified decorum, an embodiment of simplicity or of some virtue, marble or stone seems to be admirably capable of expressing the ideas of the sculptor; but when vigorous action and movement are required, as in the heroic class of compositions, and in dramatic subjects, bronze seems peculiarly appropriate.

We may point to an exceptional class of works in stone, to which it appears to us the above distinction does not apply, though we do not remember anyone has particularly noticed it. We allude to the bas-relief. Here, as the sculptured figures are only raised above the ground of the stone, the fragility of material does not apply, and the most animated composition is compatible with a legitimate use of the material. Let us example the Battles of the Athenians and Amazons, and Persians in the ancient basso-relievos of the temples of Minerva and Theseus at Athens, and other sculpture in the British Museum.

The effect of illumination upon sculptural ornament is another of the means by which the ancient artist has surpassed the modern worker. Not only did he express, by the general lines of the limbs and draperies, the movement of his figures, but he made them telling features in relieving the surface of his stone by the effect of light and shadow. How immeasurably superior in this respect was the work of the Greek sculptor, may be seen by comparing the sculptural decoration on some of our recent buildings, and the architectonic sculptures of the Athenian friezes, as for instance the Panathenaic processions, and the contests of the Centaurs and Lapithæ in the metopes of the Parthenon. Here, it will be found, the Greek sculptor employed artifice to throw out the outlines and features of his figures. The light came from below, or from between the columns, and the features and draperies were so sharply cut as to catch the light, and give expression to the figures. In the metopes, the figures in combat are distinct and clearly defined in outline, there is a breadth of stone between them with this object in view. Does the modern sculptor take these points into his consideration? We think not: it would entail too much labour; more labour than his personal interest in the work warranted. He does not reap the reward—never the praise; it is the contractors.

Sculptural decoration, to be seen at a distance, may be aided by dark grounds or colour, though the latter ought never to become obtrusive. Perhaps a light blue or Pompeian red, of pale tint, is the least objectionable form of figure-relief. There are several conventions that have been employed for the purpose of throwing out friezes and other kinds of sculptured figures; and this late Sir Matthew Digby Wyatt has alluded to these in his "Lectures." One of these is raising the figures so that they may be as much as possible detached from the surface—or alto-relievo, as it is termed—and here the sculptor can counter-sink his design partly, or sink the ground behind it. The same writer says, alluding to this method:—"In such cases, the work may still be regarded as alto-relievo (complete detachment being frequently designated as altissimo-relievo), until one-half in depth is absorbed from back to front. In that case, it reaches a stage which is known as mezzo-relievo, and in all varieties of depth from back to front, extending from half the substance of the rounded parts down towards that flatness which is characteristic of what is known as medallic sculpture, the work remains in the condition of what is known as basso-relievo." Few of our modern sculptors are experts in this kind of relief, which requires a conventional scale to be applied to the various depths of the figures, so that each may preserve a proper relation to the natural scale. In the flatter kinds it may be necessary to resort to artifice, such as to raise the parts which meet the background more than the middle portions of the figures, or to define by sinkings the outline of the composition. Sir C. Eastlake, speaking of bas-reliefs, elucidates a principle of the utmost importance, namely, that as "proportion commands shadow, so flatness commands light"; hence the flattest relief is best in dark situation. To insure distinctness of outlines, another expedient is to abruptly sink the edges of the figures on the ground, thus forming a rectangular projection. Sometimes, indeed, the sculptures of this kind are a little undercut, so as to present a deep line of shadow. In dark situations, an effect of even rotundity in the design may be thus obtained in flat relief.

Extra salience must be given to prominent figures in compositions of this kind; but we have noticed in many recent sculptures that the artist has made all his figures of equal prominence, and thereby the plot of the design is confused, and a bewildering intricacy is the result. Again, how often do we find attitudes in bas-reliefs which conceal parts of the figures, such as a leg or an arm hidden by another. The over-laying of figures must be done with considerable discretion, so that the leading actor is presented in outline with tolerable isolation. There are other expedients to produce relief, depending on the texture or surface of the groundwork and the manner in which the draperies are made to express the natural movement of the figures. In low relief, the tooling of the stone background is of much consequence. To produce half-shade or shadow, the sculptor leaves roughness or toolings on the surface, the effect of which is to give relief to the smoother figures; in fact, in this art of relief, the sculptor has to manipulate his chisel much in the same manner as the painter uses his brush.

We have said enough to show the technical qualities required to produce successful relief decoration in stone or other material, and we hope, before long, to find our art societies encouraging, by competitions and prizes, the architectural sculptor's work, rather than allow it to drift into the unsatisfactory condition of contract-carving, of which our modern public buildings can mainly boast. The architects and sculptors of the Italian Renaissance were skilled as architectural modellers, and the study of refinements such as we have noticed were common, if we can trust Vasari and other authorities of the period. But the works themselves attest the skill, and lead to the conclusion that the rules were not confined to the studios.

BUILDINGS IN SOUTH LONDON.

THE dwellers in the suburbs south of the Thames have not been idle lately in public improvements. Not to mention several estates which have fallen into the hands of the speculative builder within the last two years, we should be omitting to chronicle architectural progress if we did not record the erection of a few buildings of more than ordinary importance. One of the most conspicuous structures barely completed, is a large school known as the Mary Datchelors' School for Girls, a middle-class establishment, at the bottom of Grove-lane, Camberwell. The design is by Mr. Chatfeild Clark, and the work has been carried out in a creditable manner. Externally the building of three stories is of red brick, relieved by stone dressings, and is in a mixed style, Late Gothic windows being freely blended with Renaissance details. There is a prominent centre, the main features of which are the entrance and window above it. These are of stone; the entrance is dignified by fluted columns supporting a broken pediment, in the design of which, by the way, the keystone of the square door-head takes a somewhat undue part, being grotesquely large. The wings have mullion windows, above which are dormer gables; the general effect is bold, and the features well arranged. Ascending the flight of steps to the entrance, and passing through a short vestibule, a main corridor right and left runs from end to end of the front building with a double flight of stone stairs in the centre, on either side of which is a doorway leading into a large hall or schoolroom, about 50 by 40ft., which extends behind at right angles to the main front block. The proportions of this hall, which has a gallery at one end, are imposing. It is well lighted on each side by lofty mullion windows, covered by a roof of varnished deal, constructed with two cants on each side, springing from wooden brackets, and with a flat ceiling below the collar. The ribs or principals divide the roof into compartments, and iron tie-rods are introduced. The hall is heated by hot-water pipes on each side. Below this hall is a large dining-room of the same size. The corridor we have mentioned leads to other rooms, in the wings, devoted to class-rooms, mistresses' apartments; the kitchen forms the basement. The administrative arrangement appears satisfactory, and the dormitories are commodious. The corridor walls are coloured buff, with a dado of dark Pompeian red; the floors are paved. The straight moulded labels or cornices running over the internal doorways look meaningless without a frieze, but the general details are plain and usefully effective.

The vast and increasing population of Lambeth has created a demand for cheap dwellings of a superior class, and perhaps the "Albany" Improved Dwellings in the Albany-road, erected by the enterprise of Messrs. Sutton and Dudley, are equal to the largest experiments of the kind to be found in London. These consist of private houses and model dwellings, and contain, with the dwellings in the New Kent-road, fifteen hundred distinct residences of three, four, and five rooms. The Albany comprise four blocks of dwellings of six stories in height, the rents of which are from 5s. 6d. a week upwards, including all rates and taxes. Upon each story we find three or more tenements, each consisting of a kitchen, sitting and bedrooms. The kitchen has a range with oven and boiler; a sink with water supply enclosed, and a coal-closet; the dust-shoots are provided in each landing. Wash-houses are obtained on the flat roof. Unfortunately, like other buildings of this class, the architectural design has been left to the builder, and the blocks present rather a forbidding monotony in their lines. Their lofty flat roofs and the want of breaks in the façades, the small insignificant entrances, and the meagre details of the windows, might lead the tenant with any sense of taste to a humbler dwelling, or one of the older brick houses in the neighbourhood. Bay windows of three stories in height, with three-light windows above, are introduced throughout the huge flat fronts of stock brick and cement dressings, producing a wearisome sense of repetition. The blocks, however, have provided a better class of apartments than many of the old houses, and so they are nearly all let. A court or area gives light and air to the back rooms; but these areas are too narrow, and it is a pity the same capital has not been spent in providing a smaller number of dwellings two or three stories high with a little more garden room. The new Board School, adjoining these buildings, is another addition to the public schools of the locality, and is carried out in a less expensive manner than some of greater pretensions to style.

A pleasing contrast to the model dwellings of the Albany-road is the newly-erected block of dwellings in the Kennington-road, from the design of Mr. Hoole, architect, an illustration of which appeared in the BUILDING NEWS of last year. Begun about a year ago, it is now a finished pile, and we may without flattery say it is a striking feature in the locality. The work surpasses our expectations of it from the drawings; the colour of the dark red brickwork, almost unrelieved by stone or bands of any kind, is maintained throughout; even the angle octagon to the two roads has a red-tile roof, and the whole relief consists in the outline and design of the detail. The shops are obtained under pointed arches; the spaces above the shops included within the arches form a mezzanine. The brick voussoirs are relieved by being built in two sections, one slightly recessed from the upper, and their lower edges are worked in a kind of dog-tooth pattern. The arches spring from piers built of glazed bricks red and yellow alternately in courses, and immediately rest on stone carved caps. Above a range of connected windows, in a kind of Venetian Gothic framework of brick, are effective and cleverly destroy the monotonous effect the windows would have had if isolated. The upper ledges formed by the projecting architraves serve as a balcony to the top windows. The gabled treatment of the latrines in the centre is made a good feature, but looks rather weak above. A row of small cottages, with tiled gables, face a side road, and are built in characteristic taste, and generally we must attribute much of the success of the design to the thorough way in which the brick details have been executed. Mr. W. Smith, of Harleyford-road, S.E., is the builder. We cannot conclude these notes of new works without noticing that a new neighbourhood has sprung up covering the site of the old Surrey Gardens. Entering the new estate through the old thoroughfare known as Manor-place, we find several new roads have been formed, and blocks of three-storied houses have been built. As a rule, there is little we can call architectural; the houses are of stock brick with bands of red brickwork along the window heads, and this is varied by a white stamped brick. Cement dressings of a vicious kind rather mar the elevations, and we cannot avoid expressing regret that this estate should have been covered by dwellings of such inartistic construction.

ARCHITECTURAL ASSOCIATION.

THE first business meeting of the session was held on Friday evening; the President, Mr. Ernest C. Lee, in the chair. Upwards of fifty nominations for election were read out. Professor T. Hayter Lewis was nominated by the President, seconded by the senior hon. secretary, Mr. R. C. Page, and was elected by acclamation, the usual interval between nomination and election being specially waived. The adoption of the

ANNUAL REPORT

was moved by the President. It expressed satisfaction that the prosperity of the Association in its different branches continues to increase; as testified by the successful results of the work, and the efforts of its members to develop what had now become a recognised society for the professional education of young architects. The numerous opportunities offered for study and improvement during past years had been turned to good account by many, and, judging from the numbers who had attended the classes and the fortnightly meetings, and the merit of the work, the committee felt fully justified in stating that the Association was now in a very healthy condition. During the session papers were read by Messrs. Cole A. Adams, R. L. Cox, Basil Champneys, Robert Walker, W. H. Brewer, W. Dawes, S. W. Kershaw, M.A., E. Ingress Bell, T. Roger Smith, W. Scott, and C. G. Maylard. Visits to buildings of interest were made on alternate Saturday afternoons to the following places:—Bedford Park Estate, church and houses; St. Mary Abbotts' new tower, Merchant Taylors' Hall and buildings, Knightsbridge Barracks, Westminster Abbey, North London Collegiate School for Girls, Bow-street New Police Courts, and Hampton Court Palace. These visits were uniformly well attended. Negotiations are pending by which the Association will receive on loan from the Royal Institute of British Architects, a number of valuable books, many of which duplicate those already in the Association library. Messrs. J. D. Mathews and H. L. Florence, past-Presidents, had been chosen to act as representatives on the Committee of the Royal Institute of British Architects, engaged in preparing a general scheme for an examination for membership of the Institute. References were made to the excursions to Norfolk and the North of Italy. Considerable increased accommodation had been obtained in the library and committee-rooms, and the Association now holds the whole of the second floor of No. 9, Conduit-street, on lease, sub-letting a portion. The premium of five guineas, offered for a design for a title-page for the first volume of the second series of the Sketch-Book, had been awarded to Mr. E. W. Poley. The Birmingham branch continued to work efficiently in connection with the Association, and had availed itself fully of all the privileges of membership. Amongst the honours taken by members of the Association during the past year had been:—At the Royal Academy: F. Baggallay, gold medal; J. Ince, medal of merit in same competition; and R. Gibson, travelling studentship. At the Royal Institute of British Architects: L. Stokes, Pugin travelling studentship; F. Hemings and M. J. Landsell, medals of merit in same competition; E. Harnor, Soane medallion; L. B. Broun, the Tite prize; and G. H. Blagrove, prize essay. In conclusion, the committee strongly urged upon the younger members the importance of devoting a part of their spare time to cultivating their abilities, by joining one, at least, of the classes, which were open to all, and which would be found to be most serviceable aids to their professional progress.

Mr. J. DOUGLASS MATHEWS, in seconding the adoption of this report, referred to the active steps taken by the Association in urging upon the Institute the necessity of imposing a compulsory examination upon all future candidates for admission to the ranks of the latter body. The Association was the nursery not only of the Institute, but of the profession, and it behoved all members to see that the compulsory examination was not a failure. To prevent the possibility of such an unfortunate occurrence he hoped that special classes would be started without delay to aid members in preparing for the examination. He detailed the operations of the special committee appointed by the Institute to consider this matter, and mentioned that, besides the representative members mentioned in the report, the committee included Messrs. Roger Smith, Lacy Ridge, Watson, and other well-known members of the Association. The report having been unanimously adopted, Mr. MATHEWS, as treasurer, moved the adoption of the balance-sheet. This was of a satisfactory character, and showed total expenditure of £603 11s. 4d. The cash in treasurer's hands had been reduced from £124 17s. 8d. to £51 13s. 10d. The arrears of members' subscriptions and rents were estimated at £140; the value of the library furniture, &c., was estimated at £700; and these items, with a few minor ones of credit and liabilities in connection with the prize lists, showed a total balance in favour of the Association of £859 11s. Mr. Mathews congratulated the members on the result of the recent alterations of the premises, and stated that although the rent was now higher than formerly, the Association obtained much better accommodation, and by letting the rooms the ultimate expense was little more, while they possessed a 21 years' lease in place of being yearly tenants. The report was unanimously adopted. The library report was moved by Mr. H. W. PRATT, librarian. It stated that the attendance had been good, especially amongst new members, and an average of 42 volumes were changed each night. Owing to the increase of volumes, which now numbered 1,040, additional bookcases had been necessary. Great inconvenience was occasioned by the neglect to return books at the proper time, no fewer than 45 per cent. of the members taking out books having been fined. This report having been adopted, Mr. L. C. RIDDETT proposed that the reports be printed and circulated amongst the members. Three-quarters of an hour had been spent, and there were nine more reports to be passed, for which fair consideration and discussion was impossible owing to the impatience of members to hear the address of the evening. Messrs. CLARKSON and STANNUS objected to this, on account of the expense involved; while Messrs. FLORENCE, MATHEWS, and others considered that the reports related to a primary work of the Association, and that they ought to be entered in its archives. The promise was made that in future the reports should be published in the "Brown Book," and the consideration of the others were postponed till after Mr. Lee had read his

PRESIDENTIAL ADDRESS.

Having outlined the history of the Association at the recent conversazione, the President said he proposed that evening to deal with the immediate past with the aim of seeing what could be done to increase the usefulness of the organisation. The continued depression in trade had probably affected the Association, for although the members had increased, the classes had scarcely been so well supported as in past years, with the exception of the Class of Construction, where the attendance had been quite exceptional. The general depression ought to be but an incentive to harder work and increased application, and the committee desired to see proofs of a more vigorous spirit in the younger members than was evinced by their predecessors. There was a general lack of energy in the competitions for the Association prizes, many of which had of recent years to be withheld, as the drawings were not up to the standard. It was true that the want the Association first supplied had since been recognised by other bodies, and that various schemes for the education of the youth in architectural offices had been set on foot by South Kensington, the architectural class at the Royal Academy, Schools of Art, University College, the R.I.B.A. Voluntary Examination Class, the Building News Designing Club, and the Architectural Museum Sketch Book. These were not rivals, but co-trustees, for the education of students, and the development of these institutions and the inducements they offered were not enough to account for the falling off in these classes. The Class of Design had been almost eclipsed by the Elementary Class of Design. It seemed that the mass of architectural students in the present day found it much easier to sit down and be taught and crammed, than to work out their own conceptions in a more independent manner. To send designs up to the Building News and obtain notoriety by having them published in its pages, had naturally an infatuation for the youthful mind, and it was not to be wondered at that many should prefer such occasional fame to the more healthy, if outspoken, criticism of their fellow-men. By so doing, students lost more than half the advantages the Class of Design especially afforded; for (added the President) I myself was for many years a member, and consider that in that class I learned how to design, and, more than that, to criticise and receive criticism, and to be able to reason out my own design. In making my drawings I was always put on my mettle to anticipate what the other members of the class would object to, and to have my argument ready to refute them if possible; and this system has, I believe, since been of great use to me in dealing with my clients. He urged the neophyte, by all means, to join the elementary class, and there learn about the past styles of architecture, but when he was thus furnished for the fight, why should he, he asked, Achilles-like, go and sulk in his tent or skulk behind a motto in the Building News? To win the prize in the Class of Design ought to be harder work than to gain any other honour awarded by the Association, not excepting the silver medal; and if the class showed signs of raising itself, he felt sure the reward for the successful competitor would be increased to a sum more worthy of its old establishment. While they were pleased to note the success of the Class of Construction, which numbered more than double the members in all the other classes put together, he would ask: Did their students intend to call themselves surveyors or architects in after-life, or were they to have a new profession of "Building Constructors?" Did they imagine that if they were well up in specifications, were acquainted with the secret of the mason's craft, and could circumvent the wiles of the plumber, that design would come, a Minerva springing ready-made from the brain of the specification-maker ready to conquer the world of Art? He believed that many members joined the Association for one of three reasons: 1st, because many of their friends were members; 2nd, because Mr. So-and-So, to whom they were articled, thought they had better join, for the purpose of improving their present usefulness and for their subsequent good; and 3rd, to attend classes for the specific purpose of self-education and with a determination of going in for hard work; but of the last class he feared there were but few. He invited the younger members to take a more active part in their meetings, but suggested that it would be desirable, first of all, to study the subjects which had already been published as the titles of the papers. Small cliques or inner societies might be formed, meeting at each others' houses, to discuss these questions in private. The Association had not been unsuccessful as a whole during the past session, for the report had shown that most of the prizes offered by the Academy and Institute had been taken by their members. The programme of the coming session included a varied list of papers; six of them were essentially domestic, two were descriptive of the Association tours, and two practical, one was ecclesiastic, and the list was closed with a purely artistic paper, dealing with colour-decoration from a painter's point of view. He would appeal to the members generally to support the Sketch-Book committee in the new series of that important work, remarking that were the Association to cease to exist to-morrow, the twelve volumes of sketches already published would be a lasting monument of its energy and earnestness. Recurring to the prizes offered by the Association, he thought that one reason why more members did not compete was because the rewards were intrinsically inadequate to the labour expected, and a sub-committee would present to the committee of the Association, at their next meeting, a report on the subject, in which it was proposed: 1st, to raise a sum producing annually £20 for founding a travelling studentship, limited to members not more than 23 years of age, and election to which should be based on powers of design as well as draughtsmanship; 2nd, to endeavour to considerably increase the value of the present open prizes. He trusted the members would each support this scheme to the extent of their power. The proposed compulsory architectural examination about to be established by the Institute was heartily commended as a preliminary step towards the issue of an architectural diploma, by which unqualified persons would be prevented from trading in the name of "architect." In conclusion, he said he trusted that during the present session the harmony of the Association, notwithstanding its ponderosity, would be maintained; that in their social connection members would all be ever ready to extend a helping hand to less successful brethren; and in their labours together in that house he hoped they would strive by all means in their power to fulfil the aspirations of their motto, and learn so to order their ways that posterity would at least allow that the architects of the 19th century, whatever else their shortcomings, did, to the utmost of their power, "Design with beauty and build in truth."

Mr. Eales, hon. sec., read in succession the reports of the various classes, which, after a general discussion and protests against the sandwiching of the address between them, were adopted *en masse*. That of the Class of Design spoke of a falling off, owing to other attractions, to the extent of 25 per cent. in attendances and work accomplished. The Elementary Class of Design was more satisfactory, and equal in every respect to the average of the past few years. The Colour Decoration Class was but fairly good, there being a decrease in numbers, attendances, and sketches. The Class of Architectural Science had shown an advance upon the previous year, but the committee, thinking that its popularity and usefulness were diminished by the high-sounding title, had reconstructed it under the name of the Advanced Class of Construction and Practice. The Class of Construction and Practice was the most successful and popular class. There were 109 members, but it was complained that members did not attend regularly, especially those who sent in replies. A Surveying Class had been organised under the instruction of Mr. A. T. Walmesley, C.E., and had been a thorough success. The members visited Hampstead Heath on Saturday afternoons for practical instruction in the use of instruments, and on the following Thursday nights met in class to discuss the work done, and to study the theory of the subject, to examine new and modified instruments, &c. The Sketchbook report stated that a new series was about to be commenced, and that younger men had been put on the committee in order to infuse new blood into the undertaking. Reports were also read as to the Norfolk and Lombardy excursions, conducted respectively by Messrs. Pink and Stannus, and it was recommended that an Italian excursion be organised every two years.

Mr. Lacy W. Ridge proposed a vote of thanks to the President for his practical address of that evening, and at the *conversazione;* and Mr. Blashill, in seconding this, said, as an old Past-President, he was struck with the widening work of the Association, which rendered it necessary for a President who devoted himself, as Mr. Lee had done, to a consideration of the work of the Association, to introduce into his address an ever increasing range of topics. It seemed inevitable that each new occupant of the chair should find a little fault with the younger men for their want of energy in class-work. This was probably well, as a good deal of time was lost by young members before settling into work. Within certain limits, the creation of inner cliques within the Association was desirable, and these might be usefully organised by members for assisting one another to spend short holidays on the Continent, in seeing for themselves celebrated buildings and other modes of life. The proproposed studentship would involve a large expenditure, and its details would need careful consideration in committee, but he would suggest that a grant in aid be made at once by the Association, so that it could be organised next summer.

Mr. S. F. Clarkson, ex-president, said he had put down the number and value of the prizes now offered to architectural students by Association, Institute, and other bodies. Having assessed the value of medals and books, he found that almost £400 was annually distributed in between 30 and 40 premiums, no inconsiderable amount for an industrious student to set before him, as times were with architects, although, of course, this calculation included some second and third prizes. Notwithstanding this, he supported the proposal to establish a studentship, and believed it would be productive of considerable benefit. The vote of thanks was also spoken to by Mr. Riddett, and was carried by acclamation. In acknowledging it, the President said he felt justified in what Mr. Blashill had referred to as fault-finding, as he considered the classes should increase at least commensurately with the growth of the Association, whereas he found that while since about 1875 their numbers had been raised from 600 to 800, the classes had absolutely fewer members, and these attended less frequently than then.

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OLD ST. PAUL'S.*

(*Continued from page* 525.)

THE *Lady Chapel* is mentioned in the middle of the 13th century (f^2); in 1318, by order of the dean, seven tapers burned at the celebrations therein in honour of God, our Lady, and St. Lawrence. These were furnished by offerings to the images of St. Lawrence and John the Baptist in the chapel or that of St. Mary Magdalene on the outside thereof to the east.

An altar of *St. Mary Magdalene* and one of *St. Martha and St. Mary Magdalene*, are mentioned (h^2), as well as *St. Lawrence's Chapel* opposite the *Sacristy*. A chantry at St. Lawrence's altar was founded by dean de St. Marie l'Eglise, 1241-1243, and two deans had chantries in the *Chapel of SS. Stephen and Lawrence* (i^2), the earlier being Geoffrey de Lucy, 1231-41. Another incident connects these chapels with this part of the church. On the south side of the choir, towards the upper end thereof, was a certain oratory, with images of our blessed Saviour, SS. John B., Lawrence, and Mary Magdalene (j^2), the Celestial Hierarchy, and the Joys of the Blessed Virgin on the vault and elsewhere, the Nativity within a glorious tabernacle on the South wall, with images of St. Catherine and St. Margaret. The founder was Canon de Waltham, in 1326.

The *Sacristy* contained an altar, a furnace for baking altar breads, a lavatory for washing altar linen, and three distinct chambers (domus.) The *Treasury* (k^2), with three chambers (domus), for storing the ornaments, jewels, and plate is more than once mentioned, and in the chamber office we may recognise the chamberlain's chequer, who was bursar, collector of revenues, paymaster of stipends, and furnisher of necessaries for divine service.

A range of parcloses divided off the two eastern bays of the new work; the central chapel was that of St. Mary: on the north was *the Chapel of St. George* (l^2), and on the south *the Chapel of St. Dunstan* (m^2) divided from the Lady Chapel by the fine tomb of Henry Lacy, Earl of Lincoln.

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* A paper by Mackenzie E. C. Walcott, B.D., F.S.A., Precentor of Chichester; read before the members of St. Paul's Ecclesiological Society, Nov. 4th, 1880.

Bishop Baldock, as so great a furtherer of that stately building eastward from the quire called the New Work, was buried under a brass in the midst of the Lady Chapel (n^2). At his feet Bishop Braybroke, in 1404 (o^2), was laid under a fair marble stone inlaid with letters made every one of a several piece of brass. Bishop Stokesley, in 1539, was buried afore the altar of our Lady Chapel behind St. Erkenwald's shrine. (p^2) Bishop Eustace de Faulconbridge, who died in 1228, was buried in the south wall of the New Work, and Bishop Wengham was entombed near him. (q^2)

Three other altars occur here; one, close to this spot,

The altar of St. Michael, at which these two bishops founded chantries (r^2); and two at the other end "above the vaults of the western church" [that is, St. Faith] having the same founder Bishop Nigel, or Le Noir (1229-1241), (s^2), and endowed with older chantries by Bishop Richard de Ely or FitzNeale, (1189-98), who was buried under a beautiful tomb (t^2). These were the altars of (u^2)

St. Thomas of Canterbury and *St. Denis*, and Dean de Newport, c. 1260, had a chantry; and they were removed from another site when the apsidal choir of Maurice was rebuilt, and the work of reconstruction eastward led to the translation of several altars and bishops' tombs.

The *Crypt*, of four alleys, and eight bays, extended from the old Norman crypt of Maurice, below the flight of stairs in the upper choir at the entrance of the presbytery, and therefore was loftier than the earlier work into which two doors opened. There Bishop Theodred, in a still more ancient subterranean church, had been buried near the window of the crypt, so that his tomb was visible to the passers-by (v^2), as in two similar instances at Canterbury and St. Neot's. The new *Craodes* or Shraodes were divided by a screen into two parts: the *Chapel of Jesus* on the east, and *St. Faith's Church* on the west; a vestry was formed in one bay of the south aisle, from which a chapel projected.

The *Jesus Guild* † from 1459, every night after Compline sang three Salves "before Jhesu, Our Ladie, and St. Sebastian" (w^2), probably altars with images with those dedications.

We have some interesting particulars connected with the Guild which assembled here; they light up the subject with curious glimpses of ancient life and customs. Their days of assembly were the feasts of the Transfiguration and Name of Jesus. Six waits with banners, painted cognisances embroidered with the sacred monogram, went through all the streets and suburbs of London, playing with their instruments, to give knowledge and warning to the people; the altars were garnished; a cresset light and bonfire burned in the evening before the north door of the Craodes; herbs, and garlands, and modest fare of bread, and some barrels of ale, gladdened the day time after the solemn service sung [Regist. 457-458.] We hear, also, of ringing and tolling of bells, blowing organs, tapers and torches, as became a fraternity which had for its rector the dean.

There was also an altar of *St. Rhadegund*, which had a cross, and iron gate or carol, with a lamp hanging in a floriated crown. It was founded by Bishop Richard (x^2). The dedication is rare, but occurred in the Abbey of Bradsole and Exeter Cathedral.

The matin mass was said daily at 5 a.m. at the altar of *SS. Peter and Paul*, mentioned in 1108-27, or *Altar of the Apostles*, whence it was called the Apostles' Mass, for which in 1559 matins were substituted. The minor canons sang it. In 1229, Dean Pateshull founded a chantry here (y^2).

The inventories tell us of a store of rich vestments, a goodly array of ornaments, and costly trappings, with

> Images of gold standing in sundry stages,
> And more riche tabernacles,
> And with piercèd more pinnacles,
> And more curious portraitures
> And quainte manner of figures of golde work. (z^2).

Having "built up again that ancient and famous monument the church and steeple of St. Paul's" (a^3), we may pass on to revive its inner life.

> They whilan used duly every day
> Their service and their holy things to say:
> At morn and eve beside their anthemes sweet,
> Their Memories, Masses, and their Complines meet. (b^3)

Customs and Rite. The nave was an open walk, and subject to many irreverent and profane abuses. Stones and arrows, launched at cornice-haunting martlet and other birds, harmed images and windows; filthy practices made the door almost inaccessible; beggars and disreputable persons haunted the aisles. Twelve writers for the public service waited employment at certain stations. The sacrists, who were forbidden to wear their hoods in slovenly fashion hanging about their necks, or walk covered in the choir, were required to remove "common women, bearers of merchandise, salemen who occupied the porches, mendicants who claimed certain spots as their own, and minstrels making an unholy noise round the altars of St. Mary and the Rood" (c^3). "The south alley was for usury, the north for simony, and the horse-fair in the midst for all kind of bargains, and the font for ordinary payments of money" (d^3). In the centre "the midst alley was their large censer, reaching from the roof to the ground" (e^3). On Sundays all the City churches sent hither their congregations, at 9 a.m., to hear the Word of God. On Whitsun Monday all the country parishes of the diocese came with cross and banner; on Tuesday the Archdeacon of Middlesex; on Wednesday his brothers of Essex and Colchester, and the rest on the following days, led their people with hymn and praise and procession to offer at the high altar. There were several daily masses, the matin or Apostles' mass, mass of the Blessed Virgin, Missa Familiaris, mass for the dead and benefactors, chapter mass on Saturdays and at meetings of the chapter, sung by minor canons, high mass on Sundays and festivals at the high altar. Besides these were chantry-masses, and the private masses of the dignitaries and canons at the collateral or capitular altars, and the masses of the Guilds, three of which were connected with the cathedral. These collateral altars were served by the canons for private masses; the Benedictines had others of peculiar sanctity at Worcester and Canterbury. A shrine of each saint stood on the respective altars.

The obsequies of the Emperor Ferdinand, Charles IX. of France, and others were held in the presbytery.

The stalls were inscribed with the name of the prebendary and the antiphon of one of the five Psalms, which every occupant was bound to recite daily by the ordinance of Bishop Maurice. The bishop, in great feasts, at matins, and vespers, occupied the dean's stall, but did not wear his pontificials (f^3); two acolytes in albe and amice, holding lighted tapers, stood before him, waiting until he went to cense the altars at the Benedictus and Magnificat (g^3). At each corner of the choir stood two boys of the almonry, and acted in turn as taper-bearers. Vicars were forbidden to hang about the choir doors at Teirce, expecting the arrival of their masters. The habit of a canon in choir was a rochet (colobium), or surplice of linen, worn under a black cope, except when the silk choir-cope was used on festivals after processions, and with a grey "amess." The minor canons wore amesses of black fur called calabre, and lined with minever, to distinguish them from the chaplains and vicars, whose almuce was made of black cloth. A double cap was permitted at matins. On the great festivals four boys, surpliced, sang the versicles at matins and the hours; two priests censed the altars at Benedictus and Magnificat; the procession was made with two cross-bearers, two thuriblers, three deacons and three sub-deacons, and three acolytes; four candles burned on the altar; the choir wore copes at mass; three deacons sang the grail, and three minor canons the Alleluia. As at Chichester, festivals were classed in five orders of dignity or rank. Canons and clerks entered by the two processional doors, which opened from the aisles on the presbytery platform above the choir steps [over which hung the Lenten veil], and there bowed to the altar, and the bishop. They might also come in by the west door, and then bowed to the altar and the dean. The ceremony was repeated in leaving the choir. All stood except during the Psalms at Nocturns, and at Mass when the Lessons, Grail, Alleluia, and Tract were sung. At the Gloria Patri all turned to the altar, and also in the Creed at the Incarnatus, and at its closing clause; and three times in the Gloria in Excelsis, when, as at the Gloria Tibi Domine, they used the sign of the cross.

The order of the Procession on Great Feasts, when the altars extra chorum were censed at the Benedictus and Magnificat, during Matins and Vespers, indicates the position of the Shrine and other monuments. Two canons vested in silk copes left the sacristy, compassed St. Erkenwald's shrine, and proceeded to the Lady-altar and font. Then, separating, one censed the altars on the north, and the other those on the south side, until they met again at the altar of St. John Baptist on the north side; thence they passed through the north door of the presbytery, visiting the tomb of Bishop Roger le Noir in the north aisle, and finally arriving before the high altar. They then passed down the choir as far as the lectern, and returned to their stalls.

The ceremony of the Boy Bishop imitating "Him Whom the Innocents follow whithersoever He goeth," had led to great crowding and disturbance, so that strict decency and order were enforced. The boys personated the bishop, dean, and choral dignitaries, the archdeacon, and residentiary canons. They observed their ancient rite, made out their table of services, and read in chapter. The thuriblers and taper-bearers and servers were furnished by members only of the second and third forms. At Salisbury the canons resigned their stalls to those who personated them, but it was not so here. The bishop was pontifically habited, and sang all the office except the secret of the mass, the rest wore the choral habit; the bishop was attended by two chaplains, two taper-bearers, and five clerks, with censer and chant, in the procession, which was headed by the vergers. Supper was served after the first vespers of St. John for the bishop in the palace, for the dean and four companions in the deanery, for the dignitary and three fellows in the dignitary's manse, and for the canon, with two other boy-guests, in the residentiary house. Supper and dinner were provided on Holy Innocents' Day, after which they met in the parvise, and mounted horses provided by each of the chapter who was personated; the bishop finally giving his benediction.

Another curious local custom was the wearing of garlands of red roses by the canons at the installation of a bishop, and on other occasions; when the reception of a doe and buck was solemnly performed at the steps of the quire by the canons of the cathedral, attired in their sacred vestments, and wearing garlands of flowers on their heads, and the hams of the buck carried on the top of a spear in procession round about the body of the church with a great noise of hornblowers.

Owing to the restricted space on the south side of the cathedral, the cloisters erected on the gardens of the dean and canons were of a peculiar form, being erected in two storeys; in the centre stood the polygonal chapter-house, as in the Benedictine priory of Belvoir, the only other parallel. Below the chapter-house, as at Wells, was an under-croft, apparently used as a sacristy.

The tapers which were offered, burning, before the image of St. Mary in the nave, were extinguished by the chamberlains and bell-ringers, and carried to a room below the chapter-house to be melted [Dugd. 19]. The recovery of the remains of chapter-house and cloisters by Mr. Penrose, are among the most interesting restorations on record.

In the chapter-house the new canon was received before his installation, and invested by the tradition of the Book of the Statutes with a loaf of white commune bread laid upon it [Registrum 25]. The statutes were characterised by a peculiar embodiment of portions of the Rule of Metz for Regular and not Secular Canons, and in parts are word for word with St. Osmund's Use at Sarum, and those of Lincoln, which were founded in their turn on Rouen. Dean Ralph de Diceto built the deanery and chapel [Wharton 203] [Dugd. 7]; the chancellor's house was on the south side of the close [Dugd. 10].

Houses allotted to the dignitaries and prebendaries, and a house, attached to the fabric, in the angle towards the brew-house stood in St. Paul's Yard [atrium] [Registr. 13].

The older residentiaries are found occupying the Earl of Hereford's house in Oldenesse Lane; Dian's Chamber and Rosamund's Bower on Paul's Wharf-hill, where the church peal may have suggested to Shakespeare the ringing of St. Benet's bells. They were fortunately excused from the banqueting and costly expenses, the dancing and singing through street and lane which attended the first year's experience of a new residentiary. A vicar lived with him who did the honours and issued invitations. Every morning at prime he fed the residents' squires and such as listed to come; daily at three refections he entertained two minor canons, two chaplains, four vicars, two boys of the almonry, the vergers and the bell-ringers, who every night woke him, and continued knocking at the door for fear of his oversleeping himself and so missing attendance at matins. A special dinner to his brethren every quarter; two great feasts in the first and last quarter of residence, followed by an entertainment of the choir on the morrow on the remnants, his guests being duly invited in chapter some days beforehand; lesser suppers after compline in Advent, and provision of a minor banquet on ale, wine of Candy and home made, wine red and white, cakes and spices served before a good pie; were easy burdens compared with the reception of the Bishop, the Lord Mayor, the Aldermen, the Sheriffs, Justices and Officers of the City court, in order to maintain the honour and liberties of the church, a good-feeling between the City and the Close, and respect to the administration of the law. It is, therefore, no wonder that residence was evaded as a burden and the highest authorities interposed to enforce it.

The chaplains in 1391 occupied a manse called the Prestc-house, containing a common hall and chambers [Registrum 149]. It was also called the College of St. Peter [Reg. 236-241], and we learn its position from a chance entry 1549-50, Jan. 7. "The house that was sometyme the Peter College nexte the Dene's place in Paulas Cherche Yerde" [Grey Friars' Chron]. Each had his altar: vested in "white surplices they approached it, and there put on the priestly habit" [Registr. 235]. There were at least 55 chantries, some so richly endowed that many a rector and country vicar leaving their benefices [Registr. 142 Fuller Ch. Hist. III., 269, 271]—

> "Ran unto London, unto Saint Pauls,
> To seeken him a chantery for souls."
> —*Chaucer Prol.* 511.

The vicars, for each canon formed the choir, they had their own house and common-table. Some resided with their masters. Their dress was a surplice and cope. [Registrum 234.]

The petty canons, 12 in number, had anciently their habitations in distinct houses, some within the precinct of the church and some without, but in 1367, dined in a common hall which stood on the north side of the church adjoining Pardon Church, Haugh [Dugd. 24]. The house was called Peter Canons. The only cathedral which possessed minor canons was Chichester. The sub-canonici of Hereford were an invention of Laud.

The cemetery had a postern towards West Cheap: the north and south gates of the greater cemetery were opened only for the passage of a bier, on festivals and in Lent. On the south and east sides chains were placed to prevent the passage of vehicles [Registr. 73]. The western part of the close was the Parvise (atrium). In 1191 a great meeting of the king and his council assembled to condemn the Lord Chancellor [Hoveden III., 140]. Here the boys of London, in 1400 [Trokelaw, 352], playing at Scotch and English in their struggle to crown the mock monarch were so carried away by their game that they trod each other to death.

The Pardon churchyard, with its central chapel, resembled the cloisters of Winchester College.

Thomas Moore was buried in the cloisters of the Pardon churchyard, on the north side, in which he rebuilt a beautiful chapel which had been erected by Gilbert Becket, the portreeve, in the time of Stephen. Around the walls was painted the Dance of Machabray, a Dance of Death, commonly called the Dance of Paules. It was destroyed April 10, 1549, by the Duke of Somerset, except the library, which stood over the east alley.

"1548 was pulled doune the chappell, with the chancell house, in Pawlles churchyerde." (Grey Friars' Chron., 57.)

"1549, April 10. Was pulled down the cloister in Pawlles that was callyd the Pardon churchyerd, with the chappell that stode in the myddes." (*Ibid*, 58.)

The eight boys were lodged and boarded in the almonry, and treated with marked kindness. After supper on Innocents' day the new residentiary led one of them (his child, as they called them at Winchester, in election week) to the almonry with torches, dancing and leaping, where the company was entertained with rolls, spices and wine, until another canon arrived with his child. On the Octave the resident had to entertain the lay bishops and all his following, and dismissed them with gifts, sometimes at so late an hour that he was excused matins. On some occasions the boy had to sit on the floor, and not at the residentiary's table, in order to repress any unseemly conceit, or disorderly behaviour in the freer atmosphere of the almonry.

The bell-tower and library are mentioned in the reign of Henry I. The Custor Operis was forbidden to reside in the belfry, which must be distinguished from the Campanilo juxta Chorum, where the birds collected to the sore discomfiture of the services. Chaucer's host swears "by St. Paule's bell."

The south side of the churchyard was claimed in 10 Edward II. by the citizens, as the place of their folkmote, in which the steeple containing their common bell to summon them stood; and also the west side, that with the lord of Baynards' Castle they might view their armour for the defence of the city. The south and north sides had been inclosed by Bishop Beaumeis, and now the King made a grant of walling the rest on account of robberies and murders committed therein (*Stow*, 121).

> 1551, Feb 26. Was hanged at Tower Hylle, Sir Myles Partrygge, the whych played with King Henry the VIII. at Dype, for the grett Belferry that stuode in Pawle's churchyard.—Ibid. 74.

It was on the north side, and had a leaded spire, with a figure of St. Paul on the top, and held the four great Jesus Bells.

There was a hospital founded by Henry de Northampton, in the decanate of Diceto.

On the gates of the palace Felton affixed the bull of excommunication issued by Pius V., and atoned for his temerity with his life.

Dr. Sparrow Simpson has pointed out how we may trace the ancient close by the names of existing streets, three of which took name from the wares vended by limners and text-writers of Paternosters, Ave Marias, and Credos. Sermon Lane, however, is a corruption of Shiremonger's or Sheremoniers Lane, and, possibly, Godliman Street may be added to his list. It has never yet been pointed out that

> "For all souls
> Set in their bederolls,
> Pater noster qui
> With an Ave Maria
> And with the conner of a crede,"

were said, hence their sale here. Moreover, all lay folk, man, woman, and child, were required to say them. (Cardw. Doc. Ann. I. 154.)

The chief church of the capital of England had a formidable rival in the Benedictine monastery of West Minster, so called in distinction to the minster of St. Paul's in the east. Nearer the palace, it absorbed coronations, obsequies, marriages, and visits of state, and I need not spend time in giving a mere outline sketch of the memories of St. Paul's.

We might have seen in imagination the march of history round those sacred walls; or mingled in the royal visits, councils, and acts of State processions forcing their way through the narrow streets, with stalls of stationers, beadmakers, and text-writers, who penetrated even the nave; and across the cemetery, with its groups of mendicants; but we should have turned aside from the scenes round the cross, and the miserable desecration of the nave, related many a time and oft, and never heard without a fresh sense of shame, until the place was purged with fire. I have, however, carefully, and with discretion, refrained from traversing the historic ground already described so beautifully by Dean Milman, nor have I ventured to trespass on the architectural domain of Mr. Penrose and Mr. Ferrey, or the minuter details supplied by the local researches of Dr. Simpson. I have simply endeavoured to build again the fallen stones from among the rubbish, and to revive, what Stowe might well have more fully described in quaint old prose, rivalling the sublime verse of Milton when alluding to the church so familiar to his boyhood, he wrote in lines seldom applied, as is their due, to their real subject, St. Paul's, London.

Under the shadow of the new dome, I dare only say that, wantonly, a golden opportunity was lost to

> "rebuild
> The great Cathedral of St. Paul's with porphyry,
> And clap so bright a spire upon't, shall make
> The seaman afar off wonder what new
> And never-setting star heaven hath erected
> To make the day eternal in this island."
> (*Shirley—Honoria and Mammon, Act II. Sc.* 1.)

REFERENCES.

f^2, Dugd., 19. g^2, Dugd., 20. h^2, Dugd., 41. i^2, Leland Coll., II., 261. j^2, Dugd., 29. k^2, Registr., 223. l^2, Registr, 277. m^2, Dugd., 35. n^2, Dugd, 28. o^2, Wharton, 143; Godwin, 150. p^2, Wriothesley, I., 106. q^2, Godwin, 144, 147. r^2, Registr., 13, 182; Dugd., 28, 29; Wharton, 83, 96. s^2, Reg., 182; Dugd., 24, 29, 39. t^2. Wharton, 71. u^2, Wharton, 209. v^2, Wharton, 30. w^2, Leland Collect, I., 111. x^2, Dugd., 626; Registr., 458. y^2, Jewell, II., 630; Dugd., 7, 25, 27; Pilkington, 541; Machyn, 212; Wharton, 206. z^2, Chaucer; a^3, Remembr., 327. b^3, Spenser. c^3, Registr, 72, 79. d^3, Pilkington, 541. e^3, Pilkington, 540; My Trad. and Customs. f^3, Leland Coll., II., 355; Registr., 31. g^3, Registr., 80.

CHIPS.

At a ratepayers' meeting held at Bingley, in the West Riding, on Wednesday week, it was decided almost unanimously that the improvement commissioners be empowered to promote a bill in Parliament for the construction of waterworks, and for other improvements in the town of Bingley. The estimated cost of the waterworks scheme is £55,500.

The local board of Barkisland, near Halifax have appointed Mr. Ralph Rawstron, as surveyor.

The Whitby harbour commissioners on Wednesday week received a letter from Mr. Sandeman, C.E., of Newcastle, the successful competitor for the new harbour, agreeing to the alterations in his plans suggested by the referee, Mr. Messant, of the Tyne Commission. It was decided that detailed plans be made out and forwarded to the Public Works Loan Commissioners.

The parish-church of Blakeney, Gloucestershire, was reopened on Thursday week after restoration, including reseating, increased lighting by gas-standards, and decoration.

A large cotton-mill at Lockhill, near Sowerby-bridge, has just been rebuilt for Messrs. J. Wood and Son, after destruction by fire, from the plans, and under the superintendence, of Messrs. Utley and Gray, of Halifax. It is five stories in height, and measures 144ft. by 109ft., and 72ft. in height. Mr. C. H. Hebblethwaite, of Halifax, was the clerk of works, and the undertaking has been carried out by local contractors, that for masonry being taken by Mr. Thomas Parr, of Greetland, and that for carpentery and joinery by Mr. John Greenwood, of Ripponden.

A new pulpit in St. Nicholas' parish-church Great Yarmouth, has just been completed by the erection of five statues, carved by Flemish artists. It is proposed, as the next step in the restoration of this great church, to remove the children's gallery, which is in a bad state of repair.

During the congress of the British Archæological Association at Devizes in August last, the remains of a Roman villa were uncovered in a field at Bromham. It was decided to make further explorations of the site, and these were commenced last week under the personal superintendence of Mr. George R. N. Wright, F.S.A., of London, general congress secretary.

The memorial-stone of the Cobden Working Men's Club and Institute in Kensal-road, N.W., was laid by Lord Lyttelton on Saturday. The street frontage is of deep red and white brick. The building contains, on the ground-floor, a library, reading-room, smoking-room, and refreshment bar, and on the first-floor a large hall for meetings. Messrs. Pennington and Brigden are the architects, and the club are their own builders.

Our paragraph last week, on p. xv., respecting the reopening of Chapel Field, Norwich, was incorrect in two or three particulars. Mr. Daynes is a member of the city council, and not the city surveyor, who is Mr. W. Lake. The manufacturers of the iron pavilion were Messrs. Barnard, Bishop, and Barnard, of Norwich—not Barnard, Bishop, and *Bolton*.

Mr. H. I. Newton, architect, 27, Great George-street, Westminster, has been appointed architect and surveyor to the Incorporated Society of Licensed Victuallers. There were nearly 60 candidates for the appointment.

At a recent examination held by the Sanitary Institute of Great Britain, 9, Conduit-street, W., seven candidates were present, and certificates were awarded to H. P. Boulnois, M.Inst.C.E., W. K. Burton, A. Harland, C. Innes, M.Inst.C.E., who passed the examination for local surveyors; and a second certificate was awarded to A. Harland, who also passed examination for inspector of nuisances.

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ILLUSTRATIONS.

DETAILS, RAWDON HOUSE, HERTS.—ALMSHOUSES, SPRINGFIELD, ESSEX.—COTTAGE RESIDENCE AT MAIDSTONE.—ST. PETER'S CHURCH, PLYMOUTH.—COMMERCIAL SALE ROOM BUILDINGS, LIVERPOOL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE STAIRCASE, RAWDON HOUSE, HERTS.

The carved balustrading here is naturally treated much more broadly than the work in the "Oak room," and is almost more suggestive of a stone than an oak staircase. Any apparant stiffness in the design is softened in execution by an avoidance of rigidly straight lines in detail, though the main lines are true enough—this is particularly noticeable on the newel-posts. The balustrading to second flight of stairs is carved with grotesque panels of Scripture subjects. The animals on the newel-posts suffered mutilation some few years ago, when the house had the misfortune to be used as a ladies' school. The perspective view of the house as restored by Messrs. Ernest George and Peto, was exhibited at the Academy and illustrated on July 2nd. During the progress of the restorations, by the permission of H. R. Ricardo, Esq., I was enabled to make on the spot measured drawings of some of the fine old work about the house.—John B. Gass.

ALMSHOUSES, SPRINGFIELD, ESSEX.

These alms-houses have been erected by two ladies as a memorial, from the designs of Mr. Joseph Clarke, F.S.A. They are built of red brick, flint walls, and timbered gables, with an open porch provided with seats in front, leading to each almshouse—the roofs are tiled and the rooms are fitted with the usual conveniences to make the last days of the old people happy and comfortable.

COTTAGE RESIDENCE, MAIDSTONE.

This is the first of a group of houses being erected on the Manor House estate. It contains, besides the accommodation shown on the plan, five bed-rooms, dressing-room, bath-room and box-room, with housemaid's and linen closets, &c. The walls are of red brick with dressings of Dumfries stone, the half-timber work being of oak. The house has been built for the owner of the estate, Frederick Scudamore, Esq., at a cost of £1,200, from the designs of Mr. Hubert Bensted

ST. PETER'S CHURCH, PLYMOUTH.

The building that has been known by this name for some 40 years was originally built for Rev. John Hawker, as a kind of Free church. The building was secured to the Church of England shortly after Mr. Hawker's death. In 1848, the Rev. Geo. R. Prynne was appointed to the new parish by the late bishop, Dr. Philpotts. In 1849, a sacrarium was added to the building, and choir stalls and screen, arranged from designs of Mr. Geo. E. Street, R.A. Although all that could be done was done to improve the original ugly edifice, the want of a better and more spacious building has long been felt, and recently some liberal donations have justified the commencement of the work. The new St. Peter's will, in the main, be cruciform in shape. A characteristic of Devonshire churches has been followed in putting barrel roofs to both aisles and nave. The one fault, want of height, usually so conspicuous, has been avoided by raising the nave-roof to the height of 60ft., and thus allowing space for mural decoration over nave arcade and clerestory above. By special request, the sanctuary and present vestries had to be retained. The retention of these portions, and at the same time working them into the new design, so as to get pleasing harmony and grouping, has been one of the principal difficulties with which the architect had to contend. The sacrarium being low, and the fault of the site being want of length, it was thought wise to keep the sacrarium, as such, entire, and the choir is therefore placed under nave-roof; the continuity of the roof being thus unbroken, more apparent length is obtained. The two arches on either side of choir will be filled in with an open traceried stone screen. The chief entrance, under a massive western tower, has a tympanum, on which will be a representation of "The Majesty," with adoring angels on either side. The tower is to be about 125ft. to top of parapet, and will be capped with a lead-covered roof, cresting, and cross. The south double transept will, as it were, form the nave to the small apsidal-ended chapel. A graceful flèche, surmounting the roof, will indicate on the exterior the limits of chancel, and serve as a bell-turret. The flèche will also be used as a means of ventilation, the various ventilators in nave roof communicating with it. The stone used for the exterior facing, as well as the interior ashlar, will be the local limestone, better known as "Devonshire marble." The effect of this stone internally is very beautiful. Corsham Down stone will be used for all soft stone internal work; Beer stone being used for tracery, window and door-jambs, &c.; and Doulting stone being retained for all external strings and weathering. The church will be heated with Mr. Grundy's hot-air apparatus. The present outlay will amount to over £10,000, but the total cost when completed will probably be about £14,000. The foundation-stone was laid by the Earl of Devon, April 1st, 1880. The present contract is to be completed by August, 1881. The architect is Mr. Geo. H. Fellowes-Prynne, of 11, Adams-street, Strand, W.C.; the builder is Mr. Alfred Guy, of London.

COMMERCIAL SALE-ROOM BUILDINGS, LIVERPOOL.

This building, erected for the sale of fruit and provisions, comprises a sale-room built in the form of an amphitheatre, with gallery round three sides, over 40ft. square, occupying the S.E. angle of the site; the frontages to the N. and W. being adapted for offices occupied by the fruit-brokers. The basement is used for storing the samples of fruit, the samples being projected into the sale-room by means of hydraulic lifts. The fittings of the sale-room are of oak. The external face of the building is erected with a base of Shap granite. The dressings of Cefn stone, the plain surfaces of the walls with specially made Ruabon brick 2in. thick. The walls of staircase and landing are lined with marble. The works have been carried out by Messrs. Haigh and Co., contractors, under the directions of the architect, Mr. J. F. Doyle, and Mr. Samuel Gunning, clerk of works. The hydraulic lifts, of which there are five, are from the well-known works of Sir William Armstrong and Co., Newcastle-on-Tyne.

◆

A new Wesleyan church at Greenwich was dedicated on Wednesday week. It is situate opposite the railway station, and is in style a free treatment of 13th century Gothic. It consists of nave 85ft. by 45ft., with semi-octagonal chancel 20ft. by 18ft., and shallow quasi-transepts, and a gallery surrounds three sides of the building. The nave roof is open, with hammer-beam trusses, while the chancel has a plastered waggon ceiling. The principal elevation is of Kentish rag stone, with Bath stone dressings. The heating is upon Grundy's hot-air system. Nearly 1,000 sittings are provided. Mr. T. Lewis Banks, of Finsbury Circus, is the architect, and Messrs. Kirk and Randall, of Woolwich, are the builders.

Devonport has decided to adopt the Public Libraries Act.

THE DRAINAGE OF NEW HOUSES.

The drainage of new houses is a matter which at present is largely left to the tender care of the bricklayer. Though stoneware pipes are used, they are not unfrequently laid imperfectly, with a bad fall, and with joints defectively luted. An examination of the drains laid down to a large number of new houses in the metropolis would reveal many startling irregularities. Many of the drains would be found level, and not a few with a fall the wrong way. Such a glaring inconsistency is not always due to carelessness or wanton mischief, as some suppose, but to the settlement of the ground near the house. A recently-built mansion, according to the evidence given before the late Sanitary Section, was actually discovered with its drains quite level underneath the servants' rooms in the basement, the consequence of which was that beneath the floors the sewage had accumulated, giving rise to unpleasant smells. Again, to save expense, the builder often makes use of old barrel-drains, which, forming a large cesspool under the house, give rise to the most deadly gases. Another of the prevailing mistakes is the employment of large drain-pipes, which, by preventing the quick passage of the sewage, gives more opportunity for the accumulation of noxious gases beneath the house, and the saturation of the soil. Drains are also very insecurely jointed as a rule; we have noticed pipes with clay-luting, a good deal of which had dropped, allowing escape of both the liquid and the gaseous poison. The value of encasing under-house drains with concrete, by filling up the trenches, is unfortunately unheeded in the building of ordinary houses, and the use of bell-traps continues, notwithstanding the advice of all sanitary authorities. Ventilating pipes are still the exception in houses of the middle-class stamp, and disconnection of waste-pipe, overflow of cisterns, &c., from the soil-pipe system, is very rarely carried out.

With regard to the closets, the D-trap is not an extinct contrivance yet, though its gradual abandonment is almost certain, and there are few sanitary engineers who allow it to remain. The "pan" closet, even more objectionable, still finds customers. Into the question of trapped or trapless closets we will not enter here; the merits of both have been lately discussed in our pages, but we venture to say that no trap is perfect unless the drain is also ventilated or disconnected. Dip-traps still largely exist between the house and sewer, and in many cases they act as cesspools. It is, perhaps, useless to lament the tardiness with which improvements are made in buildings intended to be let as soon as built, and until such a measure as Mr. Cresswell's, for the inspection and classification of dwellings, is made law, we fear sanitary sermons will not be heeded. Architects can exercise some authority in specifying, and seeing that they obtain good drainage, but there is unfortunately, a large class of builders who are satisfied with old arrangements, and who need the exercise of some outside authority. In the mean time, we venture to call attention to the rules issued by some local boards, and to inquire how far the suggestions carried into effect in some towns can be enforced in the districts of the metropolis.

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CHIPS.

The church of St. Stephen's, Castle Hill, Ealing, has just been enlarged, by a new south aisle, south transept, organ-chamber (with choir-vestry under), and south porch, giving an addition of 224 sittings to the church. The work has been carried out from the designs and under the superintendence of Mr. Rovedino, architect, of 19, Craven-street, Strand, the builder being Mr. Nye, of Ealing.

A new school-church, at Bauk Quay, Warrington, was opened last week. The cost was £800. Mr. W. Owen is the architect, and Messrs. John Collier and Son the builders.

The Foresters' new Hall, in the High Street, Canterbury, was opened on Monday week. The hall has been erected under the superintendence of Mr. J. E. Wiltshier, who had the contract, from designs by Mr. John Cowell, architect. Its dimensions are 68ft. in length by 32ft. wide, and a height of 21ft. The total cost of the purchase of the property, and the erection and furnishing of the new building, will be about £3,000.

The parish-church of Edburton, West Sussex, was reopened last week, after restoration. The work has been carried out by Mr. Irish, of Lavaut, from the plans of Mr. R. Norman Shaw, R.A.

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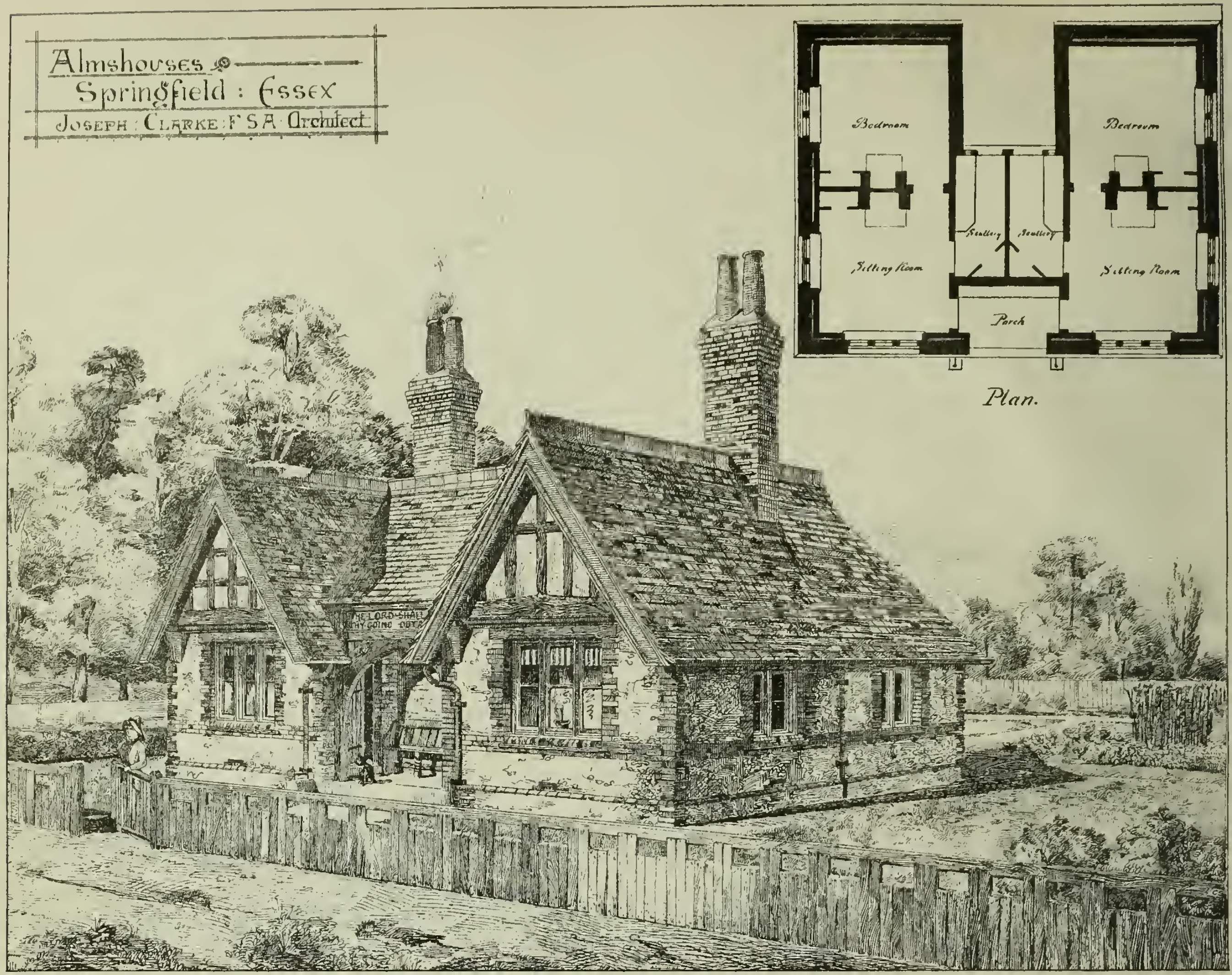
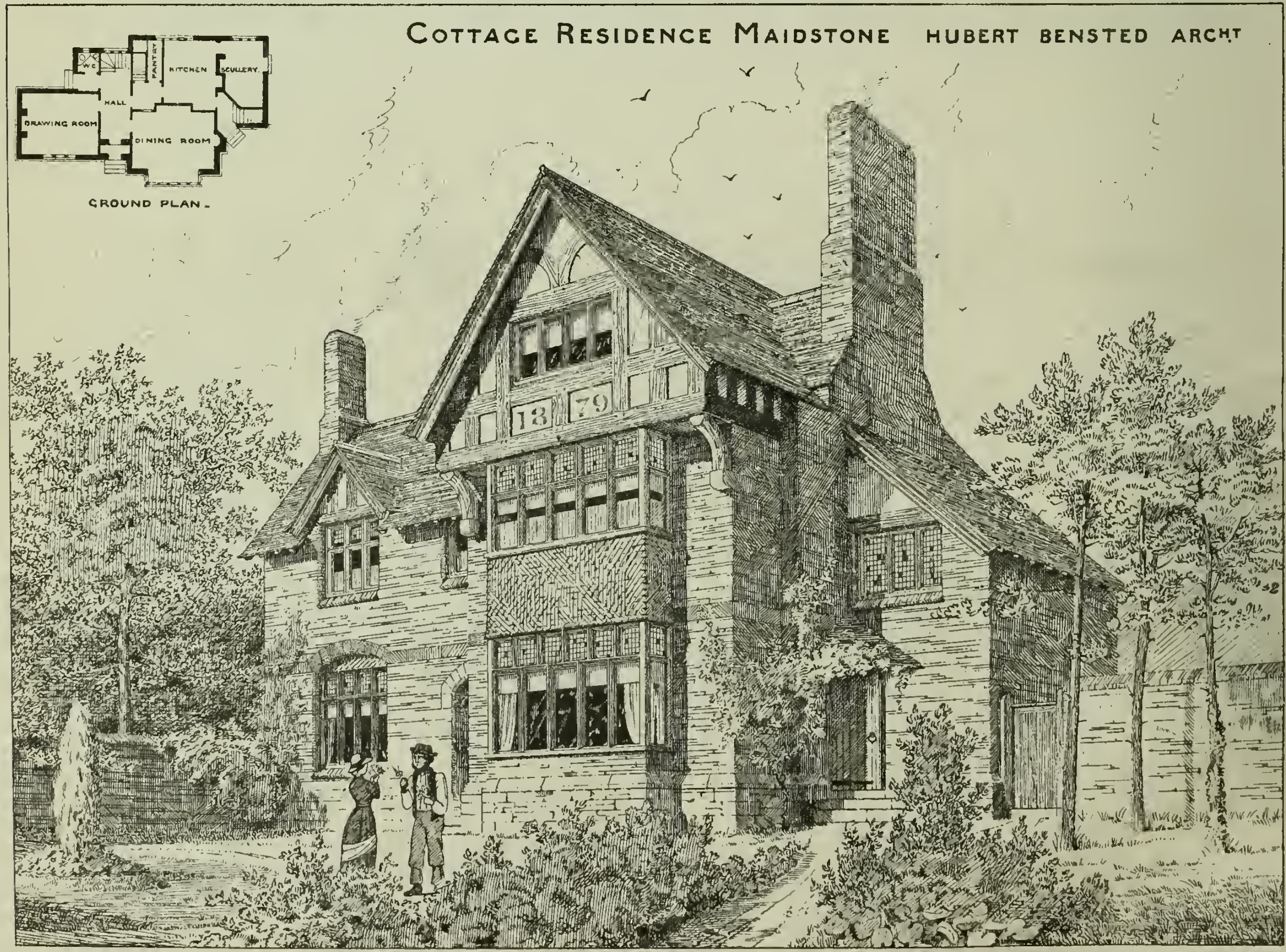


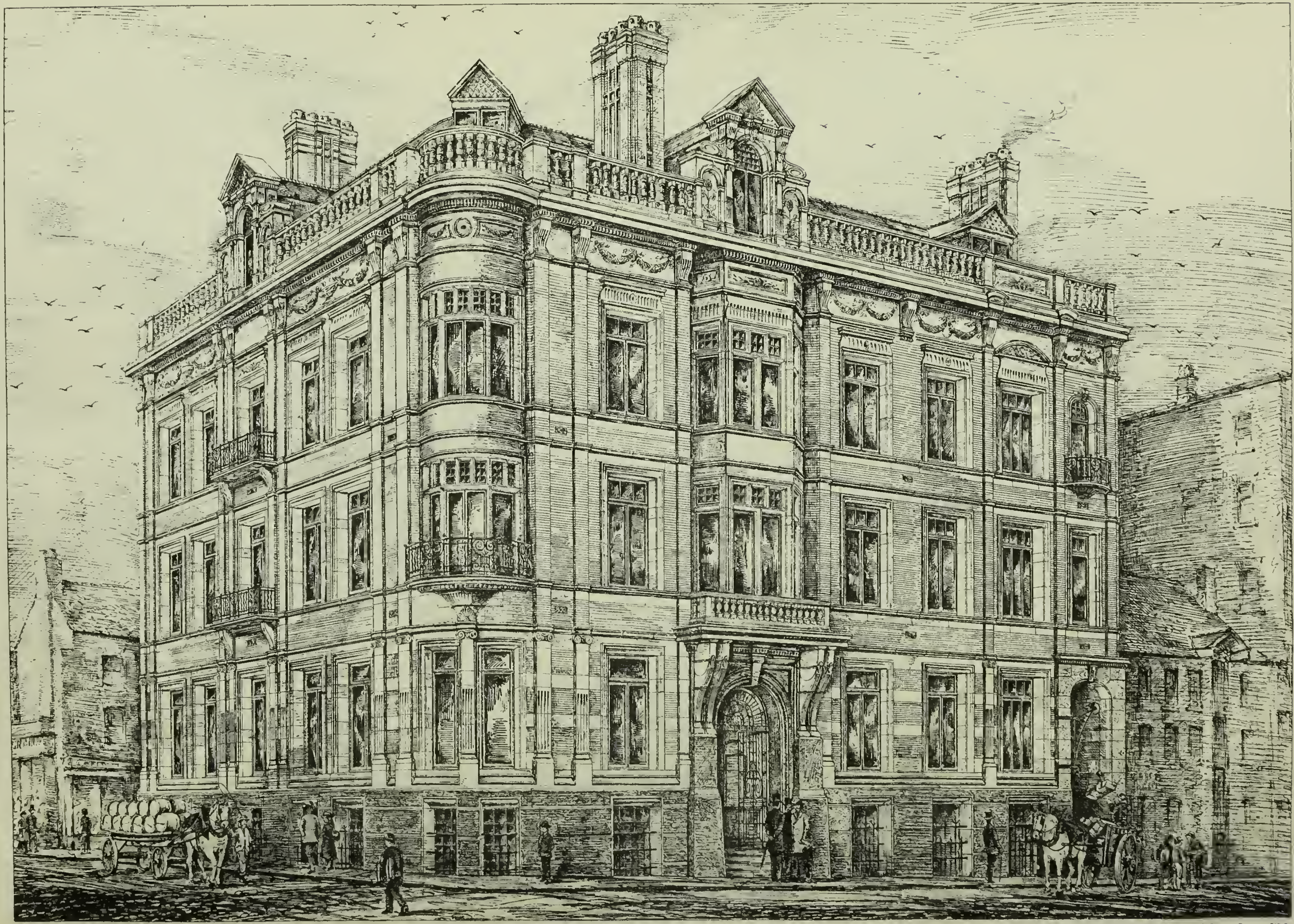
Almshouses
Springfield : Essex
JOSEPH : CLARKE : F S A Architect



COTTAGE RESIDENCE MAIDSTONE HUBERT BENSTED ARCHT

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

LIBRARY



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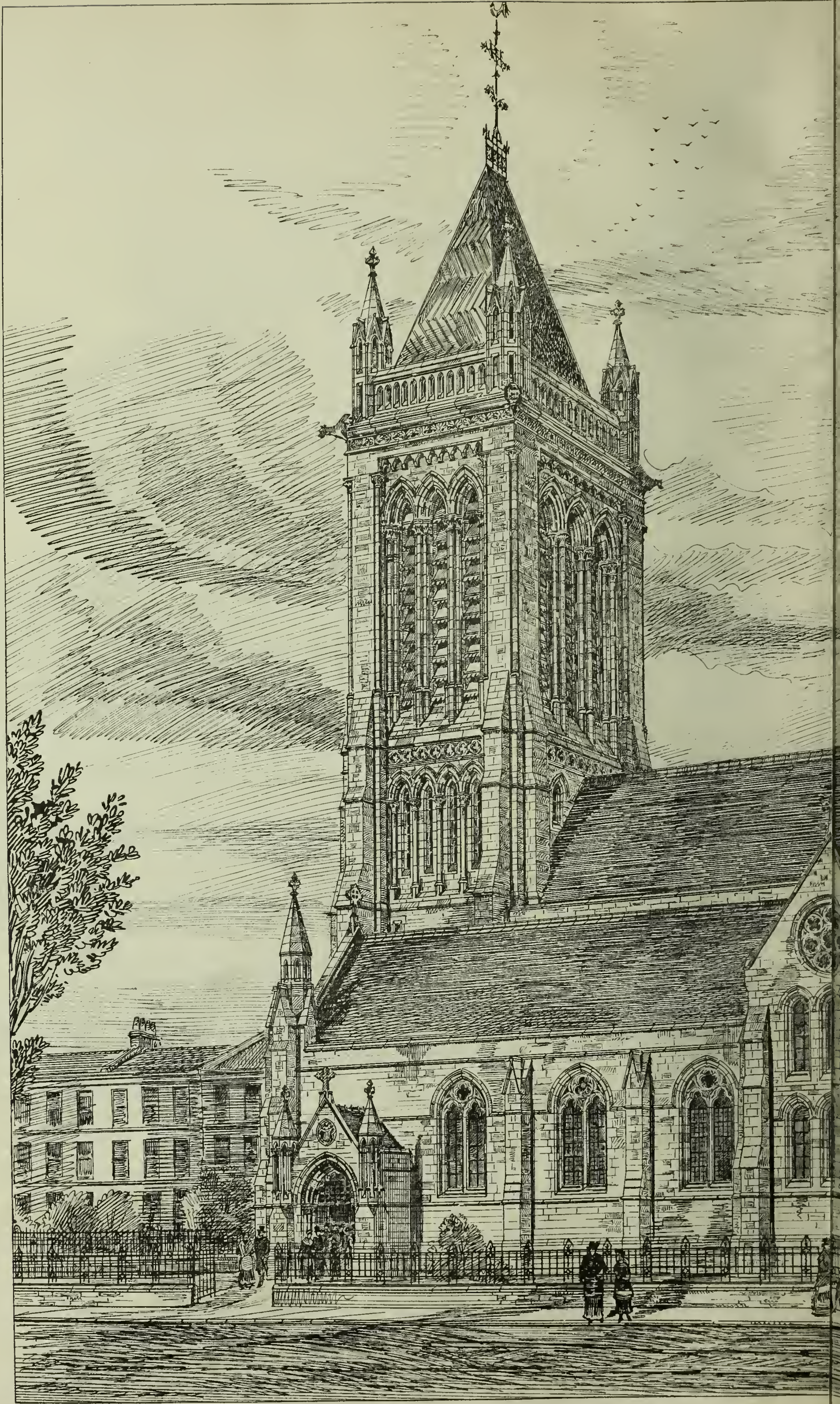
COMMERCIAL SALE ROOM BUILDINGS, LIVERPOOL.

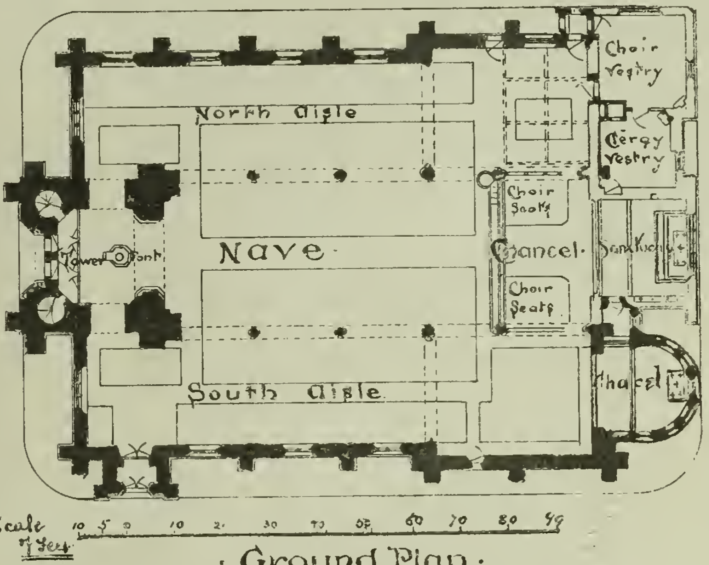
JAMES F DOYLE, ARCHITECT



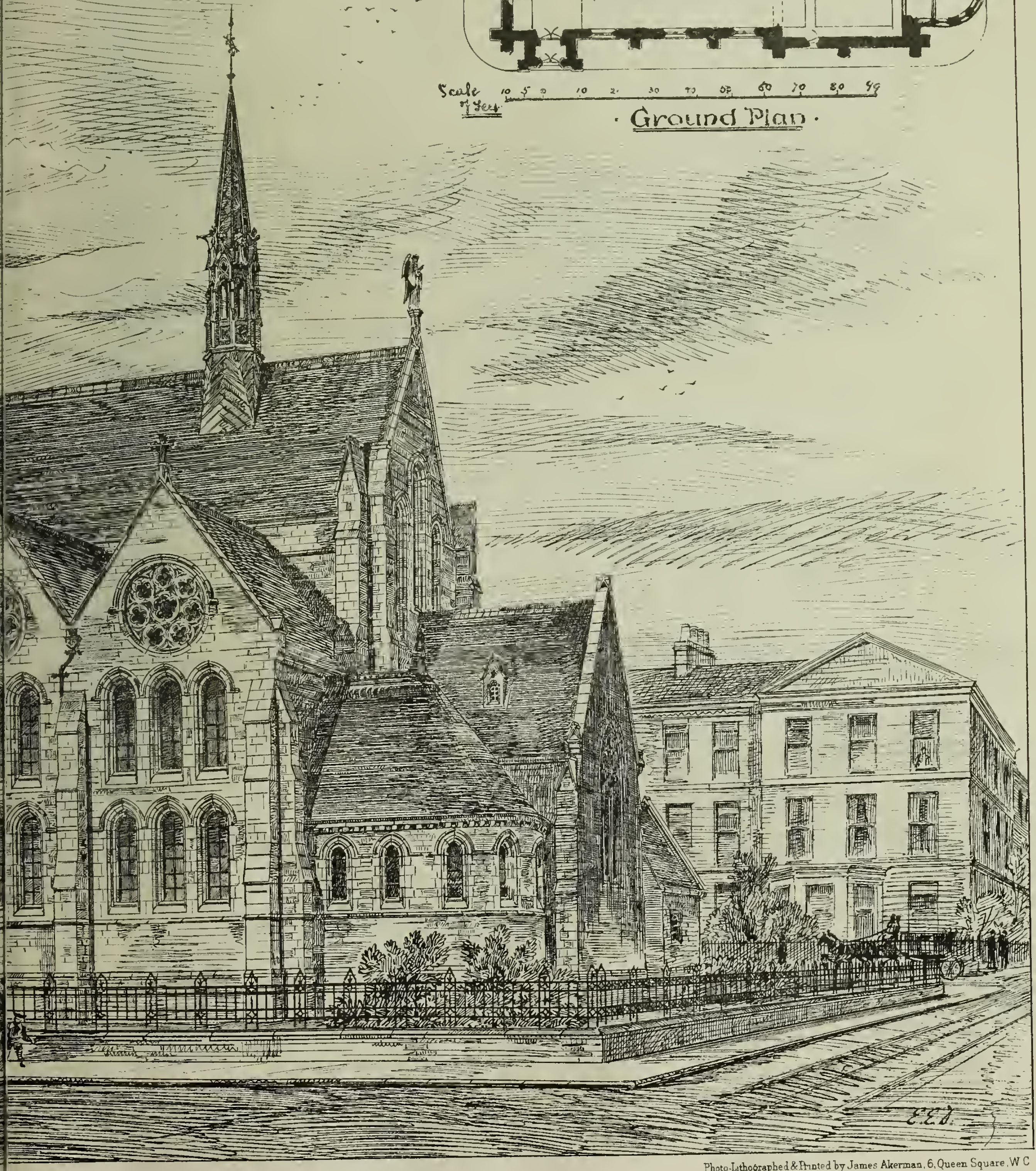
CHURCH OF ST PETER· PLYMOUTH

GEO. H. FELLOWES PRYNNE ARCHITECT

THE SANCTUARY WAS ERECTED FROM THE DESIGNS OF
Mr C.E. STREET R.A.



· Ground Plan ·



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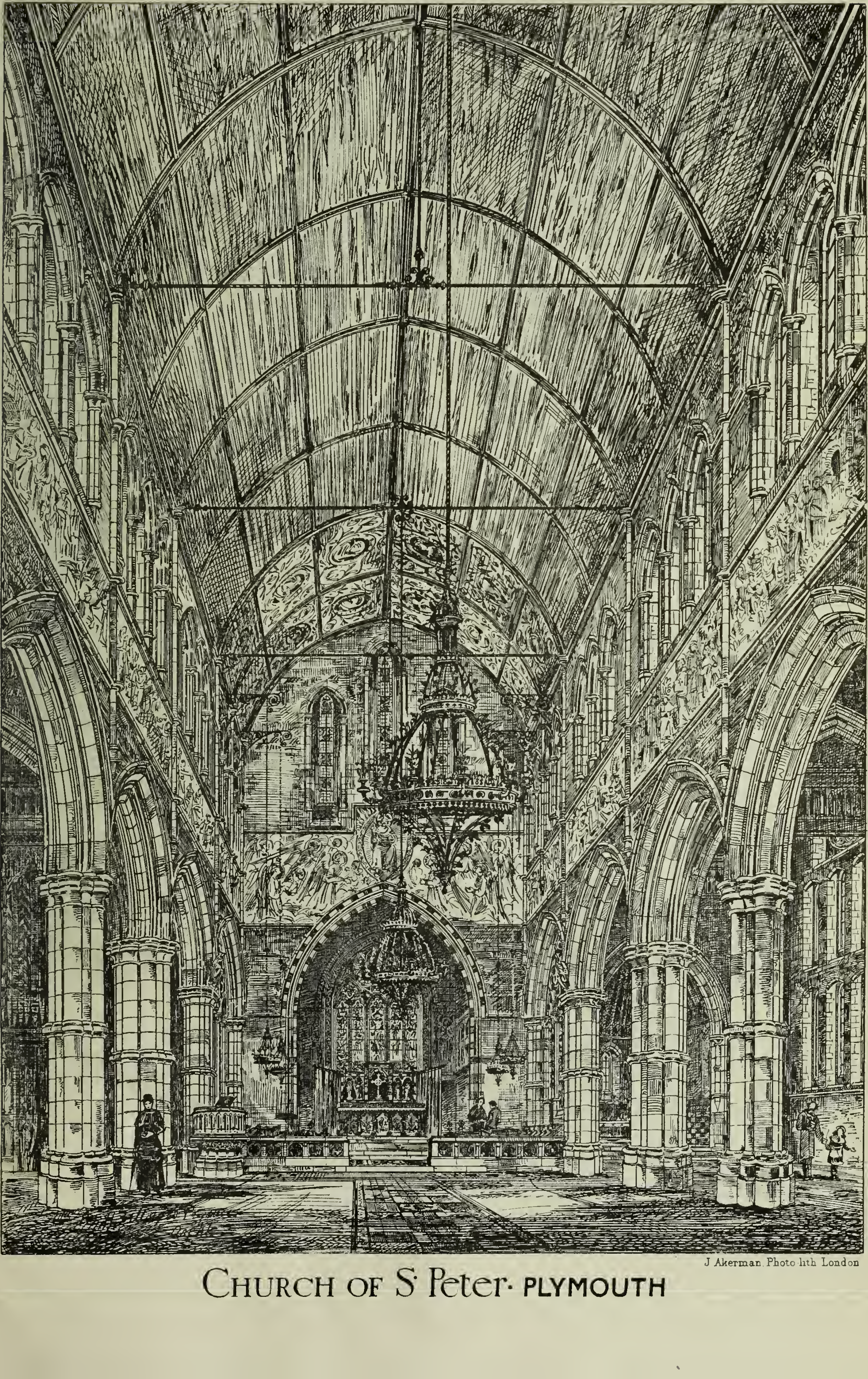
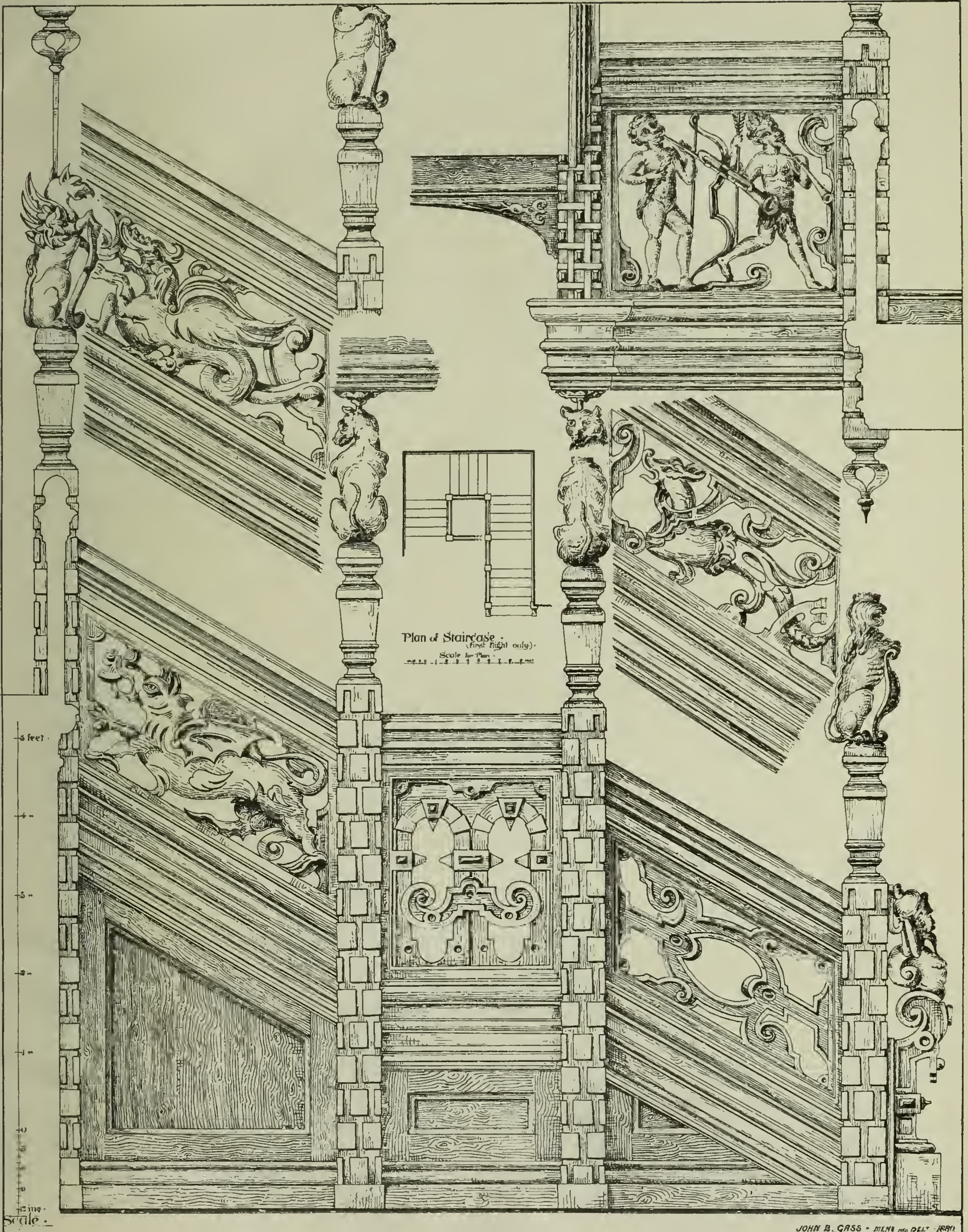


J Akerman. Photo lith London

CHURCH OF ST PETER· PLYMOUTH

THE BUILDING NEWS, NOV. 12 1880.



Rawdon House · Herts · Balustrading to Staircase · Oak · Date 1622 ·

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C

PRACTICAL GEOMETRY AND PROJECTION.*

WE possess several treatises on Practical Geometry, many of a useful kind, but in the larger number of them the requirements of the drawing-office and the workshop do not form a recognised place. The courses of study in the Science and Art Department, and the various schools of engineering, demand text-books which shall teach principles and show their relation to the practical pursuits of engineers, architects, and artisans; and of late years we have noticed an increased importance given to these matters. In the preparation of working drawings, the value of a practical knowledge of projection cannot be overrated, and the workman and artist, in whatever branch of art, ought to be familiar with methods of geometrical construction, if they intend to become intelligent adapters or economisers of material. Messrs. Collins, Sons, and Company, the well-known publishers of an advanced science series, have just brought out a text-book for students who desire to gain a knowledge of practical geometry that shall be useful to them in the drawing-office or the workshop. Mr. Henry Angel, author of an elementary treatise on plane and solid geometry, has undertaken the task, and the result is a useful addition to the small stock of text-books which treat of these subjects. The problems given have been those which many years of teaching have dictated, and they are progressive, and lead the student from the simplest to the most elaborate propositions. They have been arranged, moreover, to cover the courses pursued at the Royal School of Mines, the Royal Military Academy, and the Engineering College at Cooper's-hill. Part I. treats of plane geometry, and Part II. of solid geometry, or orthographical projection. The problems in the first part include all the chief methods; proofs are given of the leading ones, and exercises for the pupil follow at the end of each chapter. In this part will be found problems in the proportional division of straight lines, the use and construction of scales, as the diagonal scale, scale of chords, sector, &c. To construct parallelograms and triangles equal in area to other figures of the same kind, and to divide triangles and polygons into any number of proportional parts, are useful in land surveying and other arts, but are unknown to a large number of our draughtsmen and artificers. This part of the treatise might have contained a few problems relating to building construction, such as the construction of curves for mouldings, arches, but we find a paucity of examples of this kind. The second part of the book is by far the most important to the artist and workman. The student is first initiated into the principles of projection by an explanation of the co-ordinate planes assumed in defining the points, lines, and planes of a solid. These initial elements are discussed at some length, but not more than their importance requires, for it is one of the first acquisitions of any student engaged in architecture or engineering to comprehend with clearness the intersection of lines and planes. Until this knowledge is acquired no satisfactory progress can be made, for solid geometry is not a study that can be dipped into here and there, as every problem depends upon a previous definition. Some of the solutions, as that "to draw the projections of a straight line of given inclination contained by a given plane," are rather tedious, the diagrams too complicated to enlist the student's attention, and we could have wished a little less prolixity. Half the lines might have been saved with advantage. In the earlier steps we consider brevity desirable, and the diagrams should rather indicate the simplest principles of construction. Problems involving the use of a variable plane of projection contain many useful cases to the architectural draughtsman in roofing. After the projection of simple solids, the projection of flat and curved surfaces intersected by planes is considered, and these are of the greatest value to the student of architecture. Not less important in value are the problems on the interpenetration of solids. Many blunders in draughtsmanship arise from ignorance of, or imperfect acquaintance with, the principles of these. The lines of interpenetration of cylinders, those of cones and cylinders, of spheres and cones, and also of prisms, are of immense use to the draughtsman, and we are not underrating the ability of the average artistic draughtsman when we say he has usually very imperfect knowledge of these rules. The second volume of examples furnishes accurate constructions of these problems drawn to a large scale; for instance, in Plate LII., the method of determining the interpenetration of a vertical pyramid with a triangular prism in a horizontal position is given—one of the most useful cases that can arise in roofing. In the working details of mouldings and masons' work, the methods of obtaining the interpenetrating lines of prisms, of cylinders, and of curved solids with rectilinear ones are in constant requisition. Chapter XV. furnishes the student with several elementary problems in the projection of shadows which will be found useful, and a chapter on isometric projection follows, comprising a clear statement of this useful form of delineation. These problems are well illustrated in the atlas of plates, where several shaded examples are found of the stock pyramids and prisms, cylinders and cones. A few illustrations of the shadows cast on roofs by chimneys, towers, and spires would have been more useful. There are 80 plates in all in the second volume, and these are well drawn and neatly engraved, and will be found a considerable aid to the student. The lettering to some of the wood-engraved diagrams needs revision. We have pleasure in saying that the volumes, together, form one of the most comprehensive treatises on practical geometry and projection that have been published, and its author has spared no labour to make intelligible to the beginner every step of the subject.

A complete text-book,* treating of the simpler problems of plane geometry has been published by William Collins and Co. It is a new and revised edition of the treatise by E. S. Burchett, lecturer on the subject at the National Art Training School, South Kensington, published a few years ago, and will be found of use to students preparing for an elementary examination, and the extended "second-grade examinations." The elements of orthographic projection have been added to the work as an appendix, and is a good introduction to the more advanced text-book published by the same firm we have just noticed. Mr. Burchett's work is well printed and full of plates, and the solutions are printed on the page facing each plate of diagrams; the advantage of which is that the problem can be studied in one opening of the book. Parts 1 and 2 deal with the elementary problems, and these are very fully illustrated under various sections. The bisection of lines and angles, raising perpendiculars, drawing parallels, division of lines into any number of parts, the construction of triangles, squares, and polygons, take up a large portion, after which curves are treated in which section all the problems of finding curves by points and other data are given. Among these problems are to be found methods for describing ellipses from foci and through given points, parabolas, conchoid curves, Ionic volutes, cycloids, trochoids, &c. The fourth section, on Circles, is very fully treated, after which problems are given for inscribing figures, and those having reference to areas. The descriptions are short, and the letters of reference clear. Part 3, on Applied Geometry, will be found of general use to designers and decorative artists. The methods of covering surfaces with geometric figures, such as equilateral triangles and other forms are useful, and the principles for the elaboration of the most intricate patterns depending on series of triangles, squares, &c., are shown by clearly-drawn illustrations. Greek and Roman mouldings are described, and various geometrical bases of Gothic tracery. The various forms of tracery based on the circle and the polygons are self evident applications of geometry, and the work proceeds from the elements to combinations of form.

The use of scales is another valuable application of geometrical principles, and three plates are set apart to exemplify the construction of plain scales, diagonal scales, French measures of length. These are fairly elucidated, and form one of the most useful portions of Mr. Burchett's treatise. In the greater number of books on practical geometry, scales are not treated with the fulness they deserve, as, however simple their construction may be, very few people, even with a fair education, can read them quickly.

The appendix on Projection enters into the elementary cases of showing in projection solids such as pyramids, cubes, from such data as the angle of one edge or face to the vertical or horizontal plane. The method of drawing sections of solids is also clearly explained, and will be found of service to the beginner. The work is confined to the consideration of plane figures and solids, and does not enter into the more advanced problems of descriptive geometry; but the student will find every important construction in practical geometry illustrated, and the practical architect and artist may consult the work with advantage, in many cases where the memory has failed. Such a problem as that to prolong the arc of a circle when the centre is inaccessible (plate XXXI.), or the division of a line in a given ratio, is apt to be forgotten; but by the aid of clearly-drawn diagrams, they are readily recalled to the memory. We fear there is a great deal of hard mechanical labour undertaken by draughtsmen and young architects which might be saved by a study of the elements of geometry. As a handy text-book to the student of architecture and its allied arts, Mr. Burchett's treatise will be welcome. Upwards of 70 well-engraved plates of constructions are given, and a list of those required for passing in the second grade is prefixed to the volume.

WINDOWS AND FIREPLACES.

IN planning rooms, the relation between the door and the fireplace has to be considered, so that the one may not interfere with the effect to be derived from the other. A door on the same side as the fireplace is often undesirable—it creates a direct draught, and interferes with the space immediately round the fire. A doorway on the side opposite the fire is a frequent arrangement, but it is better a little on one side, not directly opposite the fire. Perhaps the best position of all is where the doorway is placed in a side wall. It is not possible, however, to lay down a hard-and-fast rule, as so much depends on plan, the aspect of the house, and other considerations. With regard to windows, the aspect of the house should be the main thing to observe, and it would not be practicable to follow all the ideas written and preached on the subject. Thus, in one book the author says: "Windows should, if possible, be arranged so as to take advantage of the wind, and secure a thorough blow through." Now this rule, admirable in hospital-wards, would not be very desirable in sitting-rooms; for the windows would have to be placed on opposite or adjacent walls, an impossibility in most houses. Imagine a sitting-room with windows in opposite walls; there would be no privacy in such a room; everybody could be seen from one side or the other, and such rooms are only tolerable in summer time or when a conservatory is attached to them. Another advice is more practicable, and that is that all windows should extend well up to the ceiling. Many modern houses are built with window-heads several feet below the ceiling, and no means of outlet exist for the escape of the heated or vitiated air in the reservoir or space above the window. In rooms where gas is burnt, the need of ceiling ventilation is most important, but even in expensive houses it is not provided. An easily made observation may convince any one of the value of having outlets in ceilings below which gas-lights are burnt. Let any one mount a table in a room that has been lighted with gas, and observe the warm, suffocating air—the products of combustion above the lights which cannot escape, but gradually cool and fall to be rebreathed.

The ordinary open fire has this great fault, that it admits more air into the flue than is necessary for combustion. As it warms by radiation, and as the heat diminishes as the square of the distance, an object 10ft. from the fire only gets one-hundredth of the heat which near objects do. But as people will sooner tolerate draughts and smoky rooms than put up with close stoves, it is of some importance to inquire into the best forms of open grates. We have recently advocated the construction of certain stoves, depending on a shallow fire made of fire-brick, with splayed sides, with no apertures below, so that the incandescent fuel is exposed to the room. Messrs. Barnard, Bishop, and Barnards' "Parson's Grate" fulfils these conditions; and some others may be mentioned, such as the Manchester ventilating grates. The common grate utilises only about 20 per cent. of the coal, and the room may register 70 degrees on one side and only 50 degrees on the other side. Fuel is lost by being converted into smoke and the fresh air is warmed only after it reaches the throat of the chimney. But those who build might obviate a good deal of this waste, if they could be brought to understand a few of the leading facts of the phenomena of warming. One thing to remember is that we can avoid draught by admitting the cold air near or below the fireplace, so that it will not require to come across the room and chill everybody who sits in its passage. Or the inlets may be introduced in opposite walls on both sides of the fireplace, by which the currents may meet and produce a more equable effect. We consider there is yet wanted a cheap grate for tenements, on the principle of supplying its own air and radiating the heat into the room. The smoke nuisance, if it is ever to be abated, must be by the adoption of an open grate that will throw out all the heat, and reduce the quantity of fuel burnt; meanwhile, if intelligent stoking and fire-making were taught in our schools, a considerable advance would be made in that direction.

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* Practical Plane Geometry and Projection for Science Classes and Schools. By HENRY ANGEL, Certificated Science Teacher, &c. 2 Vols. London and Glasgow: William Collins, Sons, and Company.

* Practical Plane Geometry. By E. S. BURCHETT, Lecturer on Geometrical and Perspective Drawing, South Kensington, &c. London and Glasgow: W. Collins, Sons, and Co.

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VENTILATION OR DRAUGHT.

IN many of the systems of ventilation no account is taken of the proper admixture of the incoming fresh air with the air in the apartment; and there may be the remarkable anomaly that while a current of air is passing through the room an occupant in one particular part or corner is receiving no benefit from the change. We have had practical verifications of this condition of imperfect ventilation in examining large rooms where a system of ventilation has been applied. It is very necessary that the whole body of air in a room should be in a constant state of circulation, that the air coming in shall be well mixed, producing uniform temperature and composition. To produce this evenness in the air it is necessary that the entrance and exit openings should be small and well divided and placed on opposite sides of the room. Ellison's conical apertures answer this purpose well. When the openings are large and near each other a current of air will be found to go straight through from one to the other. Large volumes of cold air naturally have an initial force, and take a long time to subdivide or mix, especially when aided by the presence of a fire. If we have a room with a fireplace at each end and one opening in the ceiling for the egress of foul air, a very opposite state of things takes place to what the ordinary theorist would expect. The outlet becomes an inlet through which a column of cold air enters, first falling to the ground and then dividing into two streams whose points of exit are the fireplaces, and this action will continue so long as the upper opening is the only means of inlet; but directly openings are made at the floor-level of sufficient capacity, the currents are altered entirely, streams of fresh air traverse the lower strata of the room to the fireplaces, or, becoming warm, gradually ascend and mix with the air of the room, while the upper opening serves its true purpose as an exit.

A very instructive experiment elucidating the effects of impartial ventilation was made in a French hospital some time ago. The ward had beds placed as usual next the outer walls, and below these the fresh air entered, while in the ceiling in centre of ward were openings for the outlet of vitiated air. Careful observations were made in the ward by instrumental means to test the movement of the air in different parts of the room, and the records made showed that the streams of cold fresh air, as they entered below the beds, took an upward oblique direction to the outlet in the ceiling, leaving spaces of comparatively stagnant air over the beds and in the centre of the ward-floor. It will be seen the advantage of this ventilation was but slight to those of the patients who were still breathing the air confined between the heads of their beds and the ceiling. The remedy for this state of things would be by a more distributed number of inlets with openings above the heads of the beds.

Another important principle has to be borne in mind by those who seek to ventilate so as to secure a gradual change of air throughout a room. A large supply of air cannot be obtained in a room of small cubic space. If it is sought to be done there is draught, as a quick movement air at 50° is intolerable. It is found from experience that a change of air in a room at the rate of five times per hour renders it cold and draughty, and, to secure comfort, a change of about three times an hour is desirable. So that an architect in designing a room for assembly purposes, whether a concert-room, a lecture-room, or a hospital ward, must bear in mind the unit of cubic space for each individual. If the place is small a quicker change of air becomes desirable, entailing with it draught or a passage of colder air than is agreeable to the body. A room of one thousand feet cubic capacity ought to have the air changed not more frequently than four times an hour, which would allow a space of nearly 800 cubic feet per head. The readiest way for an architect to give the necessary cubic allowance is to make his rooms a trifle higher, which is also frequently less expensive than to give a larger area.

A well-known sanitary authority, Dr. Russell, of Edinburgh, advocates the connection of both inlets and outlets with the space above the heads of occupants, which he calls a mixing chamber, into which fresh air can be brought to be mixed and warmed. This theory might be well carried out by the vertical tube or Tobin ventilator, which may be made to open into the strata of air just above the head. Others propose the inlets should be near the ceilings, so as to allow gentle diffusion and descent through the upper strata of air, and this position is better for ventilation in winter time, if we desire to avoid contact with rapid currents of cold air. Vertical pipes or flues opening below the windows, built in walls, or in casings with deflecting apertures, appear to meet all that is needed; and we would mention, among others, Shillito and Shorland's arrangements, Sheringham's valve, Jenning's air inlet as methods easily applied for the purpose of directing currents of air upwards to different classes of buildings. With respect to the outlets for large rooms, nothing is better than foul-air flues at the side of chimney-flues, with stoneware pipes connecting near or at the ceiling, with valves such as Crossley's cloth valve, or Boyle's flap valves. Other noiseless modifications of Arnott's valve we have previously described in the BUILDING NEWS, and there are some outlets, such as Weaver's, depending upon a sensitive balanced valve.

There is another matter upon which the ventilation of a house largely depends, and the architect has quite neglected it among the more pressing physical properties of his materials. It has been pointed out by Pettenkofer, and other experimentalists, that different substances allow the passage of air through them at certain rates, and that the walls of our our houses allow of a kind of transpiration to go on through them. The architect of course cannot very often dictate the material of his walls; he has to build with the most convenient material the locality affords him; but he can always regulate the thickness of his walls, and thus he might avert the evil of a cold house. It is well known that wind blowing against a wall of thin porous brickwork will quickly reduce the temperature of the room; and a house with a wet aspect will always be cold and damp unless the walls are built solidly of stone or constructed with a cavity. But solid brick walls can be battened or lined inside, and it is imperative on the careful builder that he should provide means to check the too-rapid transmission of heat or cold and moisture. Provided there is good ventilation, impervious walls are the most desirable. There is one objection to them, namely, the condensation of moisture on their inner surface, due to their being good conductors of heat; but this may be largely prevented by hollow construction, or by the use of a lining of cork,—a method that has been attended with success in some of our ironclads. A porous wall does not altogether absorb the watery vapour in the air, as some believe; but being a bad conductor, it does not condense the moisture inside.

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The New North U.P. Church at Perth, built from the designs of Mr. T. L. Watson, of Glasgow, at a cost of £7,000, was opened for worship on Sunday.

ARCHÆOLOGICAL.

A ROMAN TOWN IN HUNGARY.—The ruins of the ancient Aquineum of the Romans, the important Danubian town, have been found and partly excavated at Old Buda, one of the outer suburbs of Budapest. The archæological societies of Hungary have for years been engaged in the pursuit of seeking the tomb of Arpar, the founder of the Hungarian Empire. No tomb has as yet been discovered, but this fruitless search has led to a discovery of less national, but much more universal interest. Mr. de Torma has seen his efforts crowned by disovering in the course of this autumn, in Old Buda, the remains of the amphitheatre of Aquineum, and soon afterwards of a chapel of Nemesis, as well as of an aqueduct of considerable dimensions. Hundreds of workmen are now engaged in excavating these lofty remains of bygone times, and every day results in new and interesting discoveries. Of the amphitheatre itself, enough has been uncovered to give an idea of the large and noble proportions of the edifice. It consists of a double range of walls, built in a half-circle, whose inner, oval part formed the arena; whilst the outer, more elevated one, contained three ranges of seats for the spectators, those seats being separated by raylike walls. The inner part of the amphitheatre measures about fifty mètres, less than that of the Colosseum of Rome, and more than that of the Theatre of Verona. Judging by the proportions of this cirque, Aquineum must have had about 100,000 inhabitants. The entrances and galleries of the amphitheatre are still well preserved; not so the arena itself, which has been submerged by the damp soil. Several chapels leaning to the western side of the amphitheatre, as well as stone seats with inscriptions, have been discovered, but the most valuable of these smaller discoveries is a large stone, whose inscription gives a diminutive history of the town itself:—"Deæ Dianæ Nemesi Augustæ, honoribus C. Tuli Victorini equo publico, ædili II. curuli et T. Flavio Luciano quinquennali II. curali, pontificibus, quinquennalibus, colonniæ Aquinei, Pupilius Hylatianus Antestis numini eiusdem deæ posuit V. Kalendas Julias, Æmiliano et Raso Consulibus." So Aquineum was a Roman colony; its inhabitants enjoyed the rights of Roman citizens, and delivered judgment after the rules of the "jus Romanum." So much says this stone which Pupilius Hylatianus Antestis deposited at the feet of the statue of Diana. On the square before the amphitheatre a chapel of Nemesis has been excavated, with the statues yet in place, and frescoes with well-preserved colours, which, unfortunately, crumbled to dust on the mere touch of the hand. The largest of these statues is wonderfully well preserved. At its feet was found a sacrificial vessel with bones, and not far from it the mutilated head of the goddess Nemesis. This goddess, whose name is to be read on almost every stone of Aquineum, seems to have been the tutelar deity of the town. Cold days having set in, the excavations will soon be suspended till next spring, when they will be resumed with energy.

YORK.—A few days ago the workmen employed in digging the foundation of a new wing to the Roman Catholic convent at York, came upon a large statue of sandstone, nearly life-size, two small Roman altars, and a third block of stone, which would appear from its inscription to have been also an altar. The neck of the statue was, unfortunately, severed in raising it to the surface, and its feet also are gone, but otherwise it is tolerably perfect. The face and head are fine, and the first impression of those who saw it when brought to light was that it represented a Roman patrician. The inscription, so far as it can be deciphered, runs—"C. JULIUS CRESCENTIUS (or CRESCENS), MATRIBUS DOMESTICIS VOTUM SOLVIT MERITO LIBENS A.U.C., 1050." The altar on which this inscription is rudely cut is 17in. in height by 8in. in width. The whole is of smooth, polished stone, fluted, and coloured at the sides. The second altar, like the figure, is of sandstone, in height 12¼in., by 7in. wide, and on it nothing can be deciphered except the word "ARTI," probably the last four letters of the word "Marti," implying that the altar was dedicated to the god Mars. The third stone is of lesser dimensions, being only 10½in. high, by 5in. wide, and 3½in. deep. Its inscription is scarcely legible. Canon Raine pronounces the figure to be that of the god Mars, and the sandstone pedestal to be an altar belonging to it, the God of War being represented in the dress of a Roman warrior under the Empire. It is considered that these relics belong to the third century of the Christian era.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Dorset Antiquarian Field Club.—The session of this society was brought to a close on Wednesday week by a meeting at Weymouth. The first place visited was the Roman pavement at Preston, originally uncovered in 1871, which is still in an excellent state of preservation, the tesseræ being firm and compact, and the colours very distinct. Professor Buckman gave an address in which he stated that the villa of which this formed the floor was not of the first class, for there were no arrangements for warming the room; it appeared to have been a bath, and further research ought to reveal several others in the immediate neighbourhood. These tesselated pavements were the work of Roman ladies who occupied their time in arranging the pieces of tiles in much the same manner as our ladies did with Berlin work. "The Roman bridge," an ashlar stone structure in good preservation, was next visited, and was pronounced by Professor Buckman to have no marks identifying it with the Roman period. The works of the Weymouth Water Company were then inspected under the guidance of Mr. G. Crickmay, jun., the son of the engineer, who said the supply gained by tapping the chalk, was sufficient to meet the wants of a town 8 times the size of Weymouth; the yield had varied during the past ten years from 110,000 to 224,000 gallons per hour.

SCHOOLS OF ART.

Metropolitan Drawing Classes. — The Queen's Prize, awarded by the Science and Art Department to the successful students of the Metropolitan Drawing Classes, under the instruction of Mr. Walter Busbridge, were presented last week at the Guildhall, by Prince Leopold. The object of the Classes is to prepare working men for advancement in their respective trades. The subjects for instruction are solid geometry, machine drawing, and building construction. The fees for the whole course of seven months are 13s. 6d. for working men who make not less than 20 attendances and attend the May examination, including registration and examination fees, certificates, &c.; and £2 2s. for those not attending examinations, and middle-class students—persons who receive above £200 per annum. Notwithstanding the great increase in the difficulties of the examination, the success of the students had been altogether satisfactory. Of the 952 students who attended the 16 classes at work during the year, under the instruction of Mr. Busbridge, in the metropolitan area, 684 were successful at the May examination, and 158 obtained Queen's prizes.

Sheffield School of Art. — The annual meeting of the subscribers to the School of Art was held on Monday, Mr. M. E. Hadfield, the president, in the chair. The Head Master's report stated that the total number of students attending during the year was 350, a decrease of seven from the previous year. The work for the past year sent to South Kensington in April for examination made a total of 2,289 works, being a decrease of 423 from last year. The decrease was in the number of elementary drawings, the works sent up in the advanced stages being more numerous than in any previous year during the past seven years. The prizes awarded to these works had been—39 third grade prizes, 10 local free studentships, and in the national competition, 10 national medals and prizes. These numbers showed an increase of 10 third grade prizes, and of one free studentship, and a decrease of two national prizes, compared with last year. In the results of the second and third grade examinations an improvement over last year was shown. In closing his report Mr. Cox expressed regret that it should be the last he should have the privilege of preparing.

The annual Fine Art and Industrial Exhibition at Stockton-on-Tees was opened by Mr. Pease, M.P., on Monday. The number of exhibits is 584.

COMPETITIONS.

Gloucester.—The committee of the proposed Centenary Memorial Church in honour of Robert Raikes, the founder of Sunday schools, received upwards of 200 applications from architects for particulars of the competition, and of these 40 have sent in designs under mottoes. The drawings have been opened and examined by the committee this week.

Newtown Church, Exeter.—The Exeter Church Extension Society have selected Mr. C. Medley Fulford, A.R.I.B.A., The Close, Exeter, as architect for the proposed Church in Newtown. Seven sets of designs were sent in under motto by the Exeter architects, to whom the competition was confined, and they were all submitted to Mr. Robson, architect, of London, who reported strongly in favour of Mr. Fulford's design, bearing the motto of "Laus Deo," as worthy of the first place, and Mr. Webb second. It is proposed to proceed with a portion of the work if funds will not admit of the whole being carried out at present. The church is to be erected behind the Board Schools at an estimated cost of about £6,000, and will accommodate 800 adults.

Pontefract.—The Corporation of Pontefract have been contemplating erecting a new Assembly Room, or Town Hall for now several years past, and having advertised for plans, offering a premium of £50 and £25 for the two best, they have received some sixty sets of designs. In the new erection to be built provision is to be made for a new post-office, county court accommodation, borough offices, and other conveniences, besides a large room to seat 700 or 800 persons. The old moot or town hall is not to be disturbed. A local paper says, "There is a great objection to the site fixed upon even in the council, as well as amongst the ratepayers generally, and it remains to be seen as to whether or not the new town hall scheme will become a reality." That's comforting for the competing architects to start with!

Sewage Disposal Scheme for Norwood.—The lease of the Norwood Sewage Farm having nearly expired, the Croydon Board of Health recently invited schemes from engineers for the future disposal of the sewage of Norwood. Messrs. Bailey-Denton, Baldwin Latham, Lundie, and Fuchus competed, and the Board have resolved to adopt the scheme of Mr. Baldwin Latham, formerly engineer to the rural sanitary authority of Croydon. This scheme provides that the sewage shall be taken to Beddington farm by gravitation, and there dealt with by irrigation—the same process as is at present in use in regard to the Croydon sewage. Mr. Latham estimates the cost of his scheme at £26,000, and besides this between £4,000 and £5,000 will have to be expended on the Beddington farm to prepare it for receiving the additional sewage.

CHIPS.

Last week the restored northern aisle of St. Chad's Church, Stafford, was reconsecrated. The work has been done by Mr. W. Moss, under the direction of Mr. R. Griffiths, who adopted the design of the late Sir Gilbert Scott in every particular except that he carried the aisle a little further back than Sir Gilbert intended to do. The total cost of the restoration has been about £480.

The foundation-stone of a new Board-school at Newcastle, Staffordshire, was laid on Saturday. The schools will be in three departments, to accommodate 400 boys, 350 girls, and 250 infants, and will be constructed of brick work, in Queen Anne, the main walls being faced with dark bricks, relieved by red brick dressings and terra-cotta panels, the roofs covered with brindled tile surmounted by bell turret. The ventilation has been well studied, the fresh air being admitted by Ellison's conical ventilators underneath the windows, and the foul air extracted by means of wooden troughs constructed above the ceilings and connected to Boyle's air-pump ventilators. The plans have been prepared by Messrs. Chapman and Suape, of Newcastle, and were selected in open competition; and the contract has been undertaken by Mr. Gallimore, of Newcastle (the present Mayor), for the sum of £3,887. The total cost, including purchase of site, architects' commission, and all other expenses, will be £5,000, or £5 per head.

A coffee-tavern in High-street, Walsingham, Norfolk, was opened on the 4th inst. It has been built by Mr. E. Harold, builder, of Walsingham, from plans by Mr. Charles Beck, of Back-chambers, Norwich.

Building Intelligence.

Blackburn.—The new imbecile-wards at the Blackburn union workhouse, which were commenced in May, 1879, have now been completed. The building consists of two wings in the form of parallelograms, and are appropriated by the female and male-wards, with connecting corridors and administrative block in centre, and recreation grounds and sheds behind. Each ward consists of four large day-rooms, bathroom, and closets on the ground-floor, and two separate dormitories and work-room on the first-floor, with accommodation for about 190 imbeciles. The administrative block consists of male and female nurses' rooms, and the usual offices for culinary dispensation. The buildings throughout are faced with pierpoints from Haslingden Grane; the inside linings and walls are built up to 5ft. 6in. high with white glazed bricks, from Messrs. Cliff and Sons, Wortley, near Leeds, the rest of the walls of local bricks. The whole of the works, from base upwards, have been satisfactorily carried out by Mr. Thos. Fawcett, joiner and builder, at a cost of slightly ever £10,000. The excavations and foundation walling have been performed by the inmates of the workhouse, and the whole of the buildings have been executed from the designs, and under the superintendence, of Mr. James Aspinall, architect, Blackburn.

Bramfield.—A mansion in the Queen Anne style has just been completed for Miss Tatlock, on a site formerly occupied by a farmhouse at Bramfield, near Halesworth, Suffolk. The house is square on plan, facing the four points of the compass, and is built of specially-made Halesworth red bricks, with the deep pitched-roof, stacked chimney-shafts, gables, and dormers, and the many string-courses, mouldings, and cut brick pediments characteristic of the style adopted. A broad terrace is provided on the south and west sides, and on the north an open and half-timbered porch opens into the vestibule, and thence into the great hall, 55ft. by 26ft. 6in. This apartment is floored with oak in parquetry work, and has a dado of oak with walnut panels; to the right is a cloakroom, to the left the grand staircase, a third entry communicating with the servants' quarters. The drawing-room measures 30ft. by 19ft., exclusive of a circular bay at the south end, and a wide bay on the west side; it is 14ft. high. The flooring is in parquetry, of oak, ash and walnut, laid in an interlacing pattern. The verandah into which this opens is laid with Indian mosaics. On the opposite side of the hall is a morning-room, and next this the dining apartment, 30ft. by 19ft., which is furnished in dark pollard oak. To the east are the servants' apartments, including large kitchen, butler's pantry, servants' hall, and offices. The upper part of the building is planned as bedrooms. Mr. E. F. Bisshopp, of Ipswich, was the architect, and specially designed the fittings and furniture, which were chiefly supplied by Messrs. Meadows and Bennett, of Ipswich. Mr. R. Girling, of Ipswich, was the contractor. Mr. Ebner, of London, executed the parquetry, which was laid by Italian workmen, and the mosaics laid by Hungarian workmen. The wood carving is by Mr. Groom, of Ipswich.

Broad Hinton.—The Church of St. Peter ad Vincula, at Broad Hinton, was reopened last Monday week, after restoration. The architect employed was Mr. Ponting, of Marlborough, and the builder Mr. Barrett, of Swindon. The most difficult part of the work was making good the tower, one leg of which, so to speak, had to be taken away, the building meantime being supported by wooden shores. The chancel-arch, which was very small, and not thought to be the original arch, was removed, and a wider and higher one, of Early English design, was substituted, the old arch being used in forming the organ chamber. A Saxon window was discovered during the alterations.

Carlisle. — New Board-schools at Denton Holme were opened on Wednesday week, by Mr. R. Ferguson, M.P. They will accommodate 310 infants in a central block, and 220 boys in one wing and 250 girls in the other. The principal room in infants' school is 67ft. by 30ft., and there are three class-rooms, each about 25ft. by 22ft., and a teachers' room. The other schoolrooms are 67ft. by 22ft., and there are three girls' and two boys' class-rooms, each 23ft. by 18ft., with movable partitions. The floors are composed of a layer of concrete, 6in. thick, on which are laid wood blocks, 13in. by 13½in., and the roofs are panelled with wooden ribs and distempered interspaces, the principals being of pitch-pine. There are two playgrounds, each laid with cement, by Mr. R. M. Ormerod, on a principle which he has developed; sheds and gymnastic apparatus are provided. The schools are built of Kingstown machine-made bricks, with Howrigg's white stone dressings, and the roofs are covered with green slates from Coniston. The heating is by Boyd's hot-air ventilating grates, and the ventilation upon Westmoreland's patent exhaust system. The site cost 6s. 6d. per yard, in all, £1,178 2s. 6d. The cost has been, for buildings, £4,663 4s.; about £7 per head. Mr. Birkett, of Carlisle, was the architect, and Mr. Dodd the clerk of works. The bricklaying and masonry contracts were taken by Messrs. C. and J. Armstrong, at £2,194 14s.; the desks and fittings, and carpenter's work generally, by Messrs. Batey and Forster, of Carlisle; the slating by Mr. Irving; plumbing by Mrs. Johnson; and smith's work by Mr. John Wharton.

Castle Howard.—We noticed briefly in our last number some of the works executed here during the last few years; but, independently of the castle itself, a large amount of work has been done to the other important buildings which form parts of the great group. The mausoleum, one of the first—and by no means the least important—of Nicholas Hawksmoor's works after his separation from Vanbrugh, was in such a dilapidated state a short time ago as to cause serious anxiety for its safety. This structure has been thoroughly restored from roof to basement, though extreme care has been taken to remove as little of the old work as possible. Standing, as it does, in a very exposed position, great trouble was experienced from the constant growth of weeds in the joints of the stone terrace-walks which surround it; but these interstices were all plugged with sheet-lead about two years ago, since which time they have been entirely free from vegetation. The "Temple of Diana," an architectural gem in its way, has also been restored, and with equal care. In delicacy of detail this is, perhaps, the most refined portion of the whole group. The exterior is richly moulded and carved; the walls of the interior are composed of scagliola and inlaid marbles, the floor of floriated and scroll designs set in mosaic. Nor has the spirit of renovation been confined to the castle and its appurtenances alone. In every village on the estate the low-roofed, unwholesome cottages are being gradually eliminated, giving place to others, well-planned, with good airy rooms and picturesque appearance; and the same may be said of the new farmsteads at present built, and in course of construction. With the exception of the private chapel, mentioned in our last, the whole of the work has been carried out under the personal superintendence of Mr. Charles Ware, the resident surveyor. The interior of the chapel was entrusted to Messrs. Austin and Johnson.

Metropolitan Board of Works.—On Friday this Board received a deputation from the Vestry of Camberwell, who presented a memorial asking the Board to take over Peckham-rye, Goose-green, and Nunhead-common. The petition was referred to the works committee for consideration, as was a second one from inhabitants of Peckham as to Peckham-rye. Permission was granted to the Vestry of Rotherhithe to borrow £2,700 to defray the cost of granite cube repairing, and one-half the net cost, estimated at £6,875, was voted to the City Commissioners of Sewers for proposed improvements in Silk-street, Chapel-street, Upper Thames-street, Pancras-lane, and Little Bridge-street in the City. A debate was resumed on the petition of the Kyrle Society, praying the Board to take over Lincoln's-inn-fields and maintain them as an open space for the public benefit. It was decided to reply that the Board are not prepared to accede to the request at the present time.

London.—The Court of Common Council of the City of London, on Thursday week, were recommended by a committee to accept the tender of Messrs. John Mowlem and Co., at £74,438, for the superstructure of the City of London School, on the Victoria Embankment. In reply to inquiries, it was stated that the architects, Messrs. Davis and Emmanuel, had exceeded the original estimates by £15,000 or £16,000, but this arose from the determination by the committee to substitute stone for red brick on both the frontages, to make the building fireproof, and to cover the walls of the court with white glazed bricks. The whole cost would be about 10d. per cube foot. Mr. Shaw complained that the original proposal in the competition was, that the school should not cost more than £50,000, whereas, with the foundations and superstructure, it would cost £84,000, without fittings. The tender was then accepted. At the same meeting it was resolved to apply to Parliament for power to raise £500,000, on the security of the rates, for artisans' dwellings improvement schemes. The sum of £280 was voted for filling with stained glass, "in the highest style of art," the east window in the Lady-chapel of St. Alban's Abbey, which window is about to be restored at the cost of the Court of Common Council.

CHIPS.

The *Biograph* for the current month is strong in architectural biography. It contains sketches of the careers of Messrs. T. R. Smith, C. J. Phipps, J. Whichcord, and William White. There is also a biography of Mr. H. S. Marks, R.A.

A course of lectures is about to be delivered, under the auspices of the Trades Guild of Learning, at the hall of the Society of Arts, in John-street, Adelphi. The first of these will be given to-morrow (Saturday) evening, by Mr. William Morris, his subject being: "Hints on House Decoration."

A new pavilion was opened in the public park at Wigan last week. It has been built at a cost of £1,800, from the designs of Mr. Maclean, of Derby, under whose directions the grounds have been laid out.

A Local Government Board inquiry was held at Lowestoft on Friday, before Mr. Morgan, with reference to an application from the improvement commissioners for sanction to borrow £6,000 for works of sewerage. The town surveyor, Mr. R. H. Inch, explained the plans of the proposed works. These were opposed on behalf of Messrs. Lucas Brothers, contractors, the largest ratepayers in Lowestoft, by Mr. Law, C.E. (of the firm of Bazalgette and Law), who urged that the sewer should be one-third larger, and that the estimates of Mr. Inch were 50 per cent. too low for the works as proposed; South Lowestoft ought to have been included in the scheme. In this he was supported by other professional witnesses.

The memorial-stone of a Wesleyan school at Nechell's Park-road, Birmingham, was laid last week. The total cost of the schools when complete will be £750. The architect is Mr. Ewen Harper, of 27, Bennett's-hill, Birmingham, and the builder, Mr. Wm. Stafford, of Birmingham.

An inquiry was held at Wyke Regis, Dorset, on Wednesday week, before Captain Hildyard, R.E., on behalf of the Local Government, with respect to an application from the Weymouth rural sanitary authority to constitute a special drainage district of a portion of the parish of Wyke, and to borrow £1,750 for works of sewerage and water supply. It is proposed to lay sewers in place of the present open ditches for the conveyance of the sewage to the sea. So much opposition was aroused by statements as to the unhealty state of the village, that the inspector threatened to abruptly close the nquiry.

At St. George's Chapel, Windsor, the upper portion of the scaffolding erected some months since for the repairs of the west front has been struck, and the work of refacing with Oxford stone, which is being carried out under the supervision of Mr. Nutt, clerk of works to the Dean and Chapter, is nearly completed. The masonry, which is greatly exposed, had become very much decayed, and to protect the new work the faces of the stones have been dressed with a composition which is expected to have a preservative effect.

The prizes and certificates gained by students in the Folkestone Science and Art classes, conducted by Mr. Ullyett, were distributed by Sir E. W. Watkin, M.P., at the Town-hall, Folkestone, on Monday night.

At special meetings of the Town Council of Stockton-on-Tees and the Local Board of South Stockton, held on Monday, formal votes of approval were passed in favour of the proposed application to Parliament for sanction to construct a new bridge across the river Tees, at an estimated cost of £35,000.

Sewer-works have just been completed in Brixton-road for the vestry of Lambeth. The work was carried out by Mr. Mayo, contractor, under the supervision of the surveyor to the vestry, at a cost of £1,100.

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Student. (Todhunter's or Hamblin Smith's or Longman's "Textbook of Science.")—M. B. (Address the Secretary.)—Sceptical. (We have heard nothing of the invention. The report is evidently very much mixed up, as is generally the case.)—S. H. C. (You can probably get a copy at Batsford's, 52, High Holborn, if it is still in print.)—M. B., Bedford. (The Institute examinations, and those of the Institute of Surveyors. Address the Secretary of each for particulars.)—J. C. (All particulars will be given by the Secretary of the R.I.B.A.)

"BUILDING NEWS" DESIGNING CLUB.

Drawings Received.—Will, Boy Bill, Domus, Reginald, K. in circle, B. J.

The Mechanics of Brackets.—Several printer's blunders occur in this article on p. 541. 1. The figure has been inverted. The wall line A C should be vertical, and not horizontal. 2. At line 26 from bottom of 1st column omit the comma between W and tan. θ. 3. At line 7 from top of 2nd column, for "cost" read "cos. θ." 4. At line 34 from top of 2nd column, for "great" read "greater."

Correspondence.

TRAPLESS DRAINS AND WATER-CLOSETS.

To the Editor of the Building News.

Sir,—Surely Mr. Foster is "reckoning without his host," when he says that "*no* closet, if the supply was properly arranged by a competent man, with water-waste preventing cisterns, would ever be deficient of water, no matter from what source the supply to the house was derived."

I believe mine to be the simplest and most secure waste preventer yet invented; but even supposing it to be fitted in the best manner, and by the most competent and careful of workmen, I am quite at a loss to see how I can insure, for instance, an idle servant, or even an industrious one, always keeping a sufficient quantity of water pumped up into a cistern, or its never running short from other reasons, in the absence of a "constant service."

This possibility of running short of water, and consequent danger of derangement, getting the side of the plug plastered perhaps with a bit of paper, is quite enough to make me content with the trapped hopper basin. Moreover, I cannot see how a bad gas or smell would be so likely to pass into the house through a trapped basin as it is to pass through the plug, especially under these circumstances. And supposing the soil-pipe in either case to be properly ventilated, the water in the trap is surely not so likely to absorb the gas as the gas would be in its rapid passage upwards or downwards, as the case may be, to absorb some of the moisture. It is not as though the water were subjected to contact with stagnant or confined gas under pressure.—I am, &c.,

William White, F.S.A.

Wimpole-street, W.

Sir,—My experience of plugged closets is similar to that of your correspondents, viz., that they are liable to leak under the slightest obstruction, besides having disadvantages when slops are, as in many houses, thrown down the closet; such cannot be said of those with basin and siphon trap wholly of earthenware, when in addition to the soil-pipe being carried up of full size for ventilation, a smaller pipe is taken from top of the trap. I have never experienced any difficulty when a siphon trap has been placed between the house-drain and sewer as closely as possible to the latter, provided there is an air inlet close to and on the house side of trap, and the soil-drain properly laid to empty after each discharge, the slop and soil-drains being connected with the house-drain by a Y junction, and the former flushed with some such arrangement as a flush tank, and provided with a second ventilating pipe.—I am, &c.

W. Barns Kinsey, C.E.

Sir,—At p. 514 Mr. G. A. Foster says:—"A water-trap fixed between the house and the sewer is perfectly useless, the gases from the sewer being either forced through under pressure or absorbed by the water on the sewer side, and discharged on the house side of it." Now in general practice, and especially with ventilated drain-traps, the notions above expressed are in part untrue, and in part exaggerated imagination; in fact, as I stated in this journal about two years ago, "a sanitary scarecrow."

The water in the trap prevents the passage of gases to any harmful extent, and, further, entirely prevents the passage of rats and particulate contagia, which important use Mr. Foster appears to be entirely ignorant of. See Professor Tyndall's experiments, p. 99, Vol. XXVII., of the *Proceedings* of the Royal Society (London). Although small pieces of paper may fly up a soil-pipe, especially in the day time,—just as likely as not, at night, in fact, more likely, they would fly into the house if there was a hole in the soil-pipe, or the valve of closet was open, to let them.

In regard to Mr. Foster's remarks at p. 545, a soil-pipe acting as a ventilator for the sewer, and with an air-pipe at its foot; may generally have a current up its interior; but let an opening be made in the soil-pipe upon which the draught of the fires can act, and then the fires and chimneys will pull part of their air supply out of the soil-pipe, and so vitiate the air of the house.

As to Mr. Foster's assertion that: "No closet, if the supply was properly arranged by a competent man, with water-waste preventing cisterns, would ever be deficient of water, no matter from what source the supply to the house was derived." The statement is all nonsense. At Cambuslang, where I have been residing since May last, the water supply has been cut off for twenty-two hours out of the twenty-four for the last two months, owing to the long-continued dry weather; consequently many houses—my own amongst the number—have had no water for the closets except what was put down by hand, so the sooner Mr. Foster's "competent man" is here the better. At Greenock and Dumbarton, and I suppose many other places I know not of, the water-supply will also be deficient, so Mr. Foster's "waste-preventing cisterns" are of little or no use.

It is a plug-valve closet that is in my house; but as there is a lead siphon trap underneath I have no fear of any bad gases from the soil-pipe coming through the water; but had there been no lead trap, as with the "trapless closets," then I would require to fix down the closet-valve and prevent the closet being used, lest some of the children especially should be poisoned.

I should also be afraid of the sewer-gases, &c., were it not that I got the landlord to put in one of my ventilating drain-traps, which I presented him with, between the house and the sewer. Owing to the want of sufficient water both drains and sewer must be foul, but with no holes in the soil-pipe the water-traps keep the house safe.

Mr. Foster says of the soil-pipe under his "trapless closet" that holes in it "would be external and not internal." That is a mistake, as a foot or more of pipe might be between the wall and the turnup of the soil-pipe, and a hole large enough for a man's hand to get into might be eaten by a rat, e.g., or an open joint might occur, or a hole made by a nail, &c.

I have Mr. Slagg's book, but, unfortunately for Mr. Foster, Mr. Slagg shows both a plug and a trap! I give no opinion here upon Mr. Slagg's proposed alteration of Jenning's closet.

Instead of quoting from a book so far back as 1876, Mr. Foster might have quoted from, say, Mr. Baldwin Latham's "Sanitary Engineering," of A.D. 1878, or, newer still, from Mr. S. S. Hillyer's "The Plumber and Sanitary Houses," published in October, 1880. I will excuse him for not referring to the latter, but he ought to have referred to the former if he wished to go in for "the truth, the whole truth, and nothing but the truth." Mr. Latham, at p. 510, condemns "the ancient device of a trapless closet," and says:—"The water-trap does prevent direct communication between sewers and houses . . . . and washes or filters any sewer air that may pass the trap." Mr. Hellyer, at pp. 148, 215, &c., strongly condemns trapless closets, and speaks of "the stinking way" in which they may allow bad air to pass into the house.

Mr. Foster says it would be "as well for Mr. Buchan to examine and test before declaiming against anything of which he has had no practical experience." Now that remark is somewhat curious. I fear it is, however, only "drawing the bow at a venture," for it strikes me that as regards sanitary appliances and their applications in houses it would be difficult to get a party who had "examined and tested" more than myself, during the last six years especially.

If any one wishes to fit up trapless closets so as to be as safe as possible for the inmates, let him turn back to the Building News for January 31st, 1879, and there see the plan illustrated and described by me. If Mr. Foster can really improve upon my plan there published, let him favour us with a drawing; only any plan is bad which allows the sewer-air to pass into the house if the valve is open, and such is also opposed to the regulations of the Local Government Board, and should not be allowed.

May I ask who the "competent judges" are who condemn traps? I know of none. Mr. Foster seems to have been reading the experiments made by Dr. Fergus about gases passing through water; but it so happens that Dr. Fergus has a trap between his own house and the sewer, and when I was last working at his house a trap at each closet and sink, &c. Mr. Foster says traps should be "perfect," or they are of little real value. I fear none of us will see perfection till we get to heaven, and there it is supposed no traps will be needed.—I am, &c.,

W. P. Buchan, Sanitary Engineer.

TESTING PORTLAND CEMENT.

Sir,—From the descriptions of the various methods of testing Portland cement in your issues of October 29 and November 4, it appears to me, however possible it may be to get over the discrepancies by means of similar conditions, yet there is one factor which the present system of testing does not touch, and that is, the various rates of crystallisation possessed by different samples of cement, and it is my object to show that it is possible to test this factor. There are several known appliances used in scientific research which might be used for this end. It will, however, suffice to mention one.

Suppose all the cements to be tested be moulded in the shape of long cylinders $\frac{1}{4}$in. diameter and 1ft. long, at the same time, by running, just as beads on a cornice are run, then after seven days' immersion in water, these samples are supposed to be tested in the following manner:—The cement-cylinder is firmly fixed at one end, a stress weight (part of which is a vibrating tuning-fork with an index bristle attached) is suspended over the other end in such wise that the energy of the stress weight can be applied to the free end of the cement-cylinder without concussion. When this event takes place, a smoked disc of plate glass, in rapid revolution, is supposed to be in such a position, that at every vibration of the tuning-fork, the bristle touches the smoked surface.

Again, when the stress weight is removed from the free end of the cement-cylinder, another rotating disc of smoked glass is supposed to be placed in position so that the bristle again touches the smoked surface. Now, we are supposed to have two graphic representations of a bending strain, giving (say in 1-1000th of a second) the velocity and magnitude of the strain. These graphic representations will be in the form of a dotted spiral line, and if need be, photographic transfers can be made of them. An examination of these representations will correctly indicate, not only the relative strengths of each sample of cement, but also give the percentage of growth from the plastic to the crystalline formation in each, because the velocity of a strain is influenced by the amount of elasticity in the sample, or in other words, its plasticity.

It also appears to me a more scientific method of testing fine grinding might be adopted, and that would consist in observing the capacity of the cement powder, which could be contained in a given cylinder, under a defined stress; or the stress necessary to force the powder into a given capacity. For example: suppose the specific gravity of the Portland cement be first known, and that then one pound weight of it be placed in a cylindrical mould, say 4in. diameter, and that a very accurately fitting piston be placed on the top of the powder, and be subjected to a given stress, it will follow that the finer the powder the larger will its capacity be in the cylinder, and consequently, the position of the piston, say in 1-1000th of an inch, would indicate this capacity. Furthermore, it might be found easier to increase the stress on the powder until it reached a standard capacity, and it would be found the finer the powder the greater the stress required, and the measurement of the stress would be the indication of this fineness.—I am, &c.,

Parkstone, Dorset, Nov. 8. A. C. P.

OUR RAILWAY BRIDGES.

Sir,—My attention has this day been called to a letter signed "F." in your edition of Nov. 5, stating that a bridge between Leek and Rudyard, on the North Staffordshire Railway, is in a dangerous state. The whole of the bridges on this line, excepting such as are under repair, are in very good condition indeed, and no bridge between Leek and Rudyard is, or has been, in a dangerous state.

The one probably referred to by your correspondent has had the planking renewed; and he being a very superficial observer, has judged the bridge to be insecure because of a few decayed planks; whereas in these repairs it was found quite unnecessary to renew any of the main timbers supporting the bridge.—I am, &c.,

W. H. Stubbs, Engineer.

North Staffordshire Railway and Trent and
Mersey Navigation Engineer's Office,
Stoke-upon-Trent, Nov. 9.

A WONDERFUL STOVE.

Sir,—I have seen "a wonderful stove" as mentioned by Mr. Burges, and by careful inspection satisfied myself that it did do all that it proposed to do. The inventor, Mr. Samuel Russell, is a friend of mine, by whom many other valuable and ingenious inventions have been brought to perfection, but most of which have been burked by the apparently almost insurmountable difficulty of getting a good thing taken up by the trade.

Mr. Russell's admirable locks, the handles of which can't come off, have, however, been at last taken up by Messrs. Archibald Smith, and I have used them to everyone's satisfaction in the banking premises I have just completed for the North and South Wales Bank at Birkenhead.

I was most anxious to use in the same building some of his grates, and entreated to be able to do so. But as no manufacturer had been found by him to take them up hitherto I was baffled. I hope my more persistent friend Mr. Burges may succeed, and introduce them to the profession.—I am, &c.,

JOHN P. SEDDON.

1, Queen Anne's Gate, Westminster, Nov. 5.

CHIPS.

The new district church of St. Paul, in the hamlet of Bentley, South Weald, Essex, was consecrated by the Bishop of St. Alban's on Wednesday week. The style is Early English. The materials used are flint facings with dressings of Westwood stone, and for all internal work, Corsham stone. Sittings are provided for 250 persons, and the cost of church and adjoining parsonage has been about £10,000. Mr. Ernest C. Lee, P.A.A., is the architect, and Mr. Hammond, of Romford, the builder; the carving is by Mr. Earp, of Kennington, and the stained glass by Messrs. Clayton and Bell. We illustrated the church, by a perspective sketch from N.E., on May 7th of the present year.

A stained-glass window is about to be placed in Lichfield cathedral, to the memory of officers and men of the 80th regiment killed in South Africa.

New lines of tramway from the Piccadilly, Manchester, to Rusholme, Stretford, Old Trafford and Oldham, were opened for traffic last week.

An inquiry was held at Kidderminster on Friday week before Mr. Arnold Taylor, inspector, into an application to the Local Government Board by the town council for sanction to a loan of £3,000 for works of sewage disposal. Mr. Taylor intimated at the close of the inquiry that he should recommend the application.

The town-council of Cardiff accepted on Monday the offer of Mr. G. B. Marks, to paint and present to the town a portrait of Mr. Peter Price, architect, to be placed in the new free library, of which Mr. Price was the originator.

The Archbishop of Dublin held his visitation of the clergy of Kildare in the newly-restored south transept of St. Brigid's Cathedral, at Kildare. The work of restoration in this cathedral has been for many years in progress, from the designs of Mr. G. E. Street, R.A.; the central tower and south transept are completed, the north transept and nave are being roofed in, and the operations are approaching completion.

The Dublin Corporation received on Monday a letter from Mr. A. Montgomery Moore, tendering for the South City paving, and offering, if his tender were accepted, to abandon an action he has brought against the corporation in reference to previous tenders made by him. It was proposed that the letter be marked "read," and suffered to lie on the table, and a personal discussion ensued, the Lord Mayor explaining the circumstances under which the previous tenders for the South paving were abandoned after the acceptance of that of Messrs. Spaight and fresh ones invited. In the end, the offer was referred to a committee of the whole corporation.

The parish-church of Seavington, near Ilminster, has been reopened after restoration. The church has been reseated, new pulpit and desk erected, and the walls repaired, and two fresh windows opened out. The chancel has also been restored, a new roof placed over it, with closed-boarded ceiling, and new paving laid down. Mr. Hall was the architect, and Messrs. Vaux and Parkhouse, of Leavington, were the builders.

Christ Church, Folkestone, has recently been much improved by the addition of a clerestory to the nave, and by the entire remodelling of the roof. The arcades being formed of too slight construction to bear the weight of a masonry story on them, it was determined to construct the addition in timber. The additions have been carried out by Mr. Brooks, of Folkestone, from designs of Mr. A. R. Barker, of 11, Buckingham-street, Strand, Mr. Burgess Reeves, of Folkestone, acting as clerk of the works.

The church of St. Mary the Virgin, Barnet, has recently been enlarged, by the restoration of its chancel. The work has been carried out by Messrs. Vernon and Ewens, from the designs of Mr. A. R. Barker, of 11, Buckingham-street, Strand.

Intercommunication.

QUESTIONS.

[6290.]—**Surveyor's Charges for Quantities.**—Will some of your readers kindly tell me the following query:—Where a quantity surveyor has been engaged to take off quantities by a builder, and the latter is not successful in getting the job for which the quantities were taken out, can the surveyor recover the usual commission, or does any custom exist by which the builder is entitled to the surveyor's services at a less charge?—ENQUIRER.

[6291.]—**Rain-Water Tank.**—I am arranging an underground storage tank to take the rainfall of 25 squares (measured horizontally) of slate roofing. Our rainfall may be averaged at 30in. annually, which gives approximately, 37,500 gallons a year. I wish to draw out 100 gallons every day. What proportion of the whole yearly rainfall should I provide in the capacity of my tank, and how should it be calculated?—R.

[6292.] — **Honours Building.** — "Rivington's Notes," Part III., gives the materials only for Honours Examination in building construction. What is the best work for the other subjects, viz., solving simple problems in theory of construction, safe dimensions of beams subjected to dead loads, to trace the stresses in roof trusses, &c., conditions necessary to stability in ordinary and retaining walls. The books recommended, too, have no reference to trigonometry? Also recommend work on modern styles, which would help to design buildings from given conditions.—STRAINED.

[6293.]—**Gable.**—A client of mine bought a house, one gable of which is built up to a neighbour's garden. The rain drives through the said gable, and the owner of the garden refuses to allow my client to enter his property so that repairs can be effected. Can we demand admittance into the adjoining property to make good the gable, and, if so, can we cover with slate or cement, providing we do not let it project beyond the footing course on the garden side? A trustworthy reply will be appreciated.—LUX.

REPLIES.

[6282.] — **Commission.** — A fair commission for "W. J." to charge for preparing plans, specifications, quantities, detail drawings, would be 4½ to 5 per cent. on the estimate. It is a general rule to charge for the drawings and specification and procuring tenders about 4¼ per cent., reserving 1¼ per cent. for superintendence. In fact, he has done quite three-fourths of the work, but it would have been more satisfactory to agree to take a certain sum which shall cover all labour in case of the building falling through.—G. H. G.

[6283.]—**Horseshoe Arch.**—What connection, except in form, there is between a horseshoe arch and a smith's forge it is difficult to see, but the idea is suggestive at any rate, and J. M. Sturgess may find examples of such arches in many large towns. If of stone, there is no difficulty in forming one, nor is there any if stucco is to be used, but a brick arch of that form would be best constructed of purpose-made bricks, properly set out to a template, or the inverted springings of the arch might be of stone or terra-cotta cast of the size from the impost to the level joints of the arch.—G. H. G.

[6283.]—**Horseshoe Arch.**—An example of an arch to a blacksmith's forge, built in the form of a horseshoe, may be seen in the small village of Tinwell, Rutland.—DERWENT E. NEWMAN.

[6283.]—**Horseshoe Arch.**—Lord Powerscourt built some years ago a very pretty forge with a horseshoe arch as entrance, at the picturesque village of Enniskerry, Co. Wicklow. and recently Lord Brabazon has copied the idea on his estate, close to Rathdrum, Co. Wicklow.—F. W.

[6283.]—**Horseshoe Arch.**—At Ford, in Northumberland, near the border town of Coldstream, there is a blacksmith's shop, with an entrance formed by a well-executed stone arch, of the "shape and pattern" of a horseshoe.—STUDENT.

[6283.]—**Horseshoe Arch.**—At Trentham Hall, Staffs., the seat of the Duke of Sutherland, the entrance to the smith's shop is a stone arch in the shape of a horseshoe, studded with nails, designed, I believe, by the late Sir Charles Barry.—STAFFS.

[6284.]—**Liability for Quantities.**—If the contract was signed with the knowledge implied by the notice attached to the quantities, the contractor cannot obtain redress for errors of quantities from the architect; but I believe the contractor can require the name of the surveyor.—G.

[6286.]—**Warming Rooms.**—One of the simplest modes of warming a room is to have a small stove, preferably earthenware, fixed in a convenient position. Doulton's radiating tile stove, which is cased in fireclay and decorated with faïence, is a recent improvement, and it is said to be quite free from smell. Another stove, cylindrical in shape, and made of terra-cotta, into which a fire-box is introduced, is simple and effective. It is best, if possible, to bring an air-pipe from the outside.—G. H. G.

[6286.]—**Warming Rooms.**—If "Alpha" would adopt the Shorland patent back to his firegrate, and conduct the warm air generated by it to his room without a fire, as I have done in mine, he will find no difficulty in warming it without injury to health. I found on testing the other day that the inflow of warm air to my room without a fire was 102° Fah., although it is two stories higher than where the warm air is generated. I have had these Shorland backs in use for upwards of four years, and find them most excellent for warming staircases and rooms not convenient to have fires in them.—J. SIMPSON, Sunny Side, Ashbourne, Derbyshire.

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Works of water-supply are about to be undertaken by the local board of Leyland, near Manchester, from the plans of Mr. A. de Rance, C.E.

STAINED GLASS.

CRAWLEY.—Mr. John Davis, of Wyle Cop, Shrewsbury, has just completed a set of stained-glass windows, intended to be placed in Crawley Church, Sussex, which has recently been restored. A short time ago he sent for the same church a large quantity of stained glass for the chancel window, which consists of three lights, in the centre of which is the Crucifixion, with a figure on each side representing the Virgin Mary and St. John, with ornamented quarry work as a background, and richly ornamented borders. Those now about to be sent are for the aisle, and consist of 13 compartments, each one containing some Scriptural subject.

STATUES, MEMORIALS, &c.

PARIS.—The Municipal Council of Paris, at its last sitting, voted the sum of 725,000 francs for statuary and carving at the new Hôtel de Ville. The sculptors who are to execute the work were also chosen. These works consist of 106 statues of celebrated persons born in Paris, which are to be placed in the niches in the façade, three monumental chimneypieces, two marble statues in the great salle à manger, four groups in stone in the préfet's staircase, and caryatides, tympana, medallions, &c.

WATER SUPPLY AND SANITARY MATTERS.

SYDENHAM, OXON.—Important drainage works have lately been completed at the Vicarage, Sydenham, for the Rev. J. G. Heisch, from the plans of Mr. W. Barns Kinsey, C.E., Southwark-street, London, having for their object the prevention of pollution of the village brook, which is a tributary of the Thame, and forms the water supply of a portion of the village. The rain-water from the roofs has been stored after passing through a percolator, the surplus and surface waters alone going to the brook. The slop-water and sewage, after the solids have been separated by a novel mechanical arrangement before decomposition has commenced, is utilised by sub-irrigating a portion of the glebe cultivated as garden-ground. A simple form of ash-closet has been erected to serve as a model for those of the cottages, and it has been found that the fine dust from the screened ashes of one ordinary cottage fire, applied once in the day, will deodorise and form the excrement of the previous day into a portable manure, a fixed ash-screen and shallow water-tight pit being alone required. The drains are all laid with glazed pipes and Stanford's patent joints, in straight lines, with inspection-openings at every change of direction, and with a "Field's" self-acting flush-tank at the head, have been found to run empty with a fall of 1 in 120. The sub-soil is gault, but no inconvenience has been experienced during the late heavy rains. Ventilation is provided for by air-inlets at the outfalls, and by ventilating pipes carried up at the heads of the drains, a steady current of air having been found to traverse their entire length without regard to the direction of the wind. The arrangement has been designed with a view of testing the possibility of dealing with the sewage and slop-water of villages and country mansions at a low cost, and more particularly to abolish wasting cesspools, which, from their proximity to the shallow wells, have been, to an extent, the cause of a high death-rate in the village.

LEGAL INTELLIGENCE.

AN ARCHITECT'S CHARGES.—At Wakefield County Court, on Tuesday week, before Mr. W. T. Greenhow, judge, A. Himerton, architect, Horbury, and formerly of Wakefield, sued Ash and Co., maltsters, Birdbush, Agbrigg, for £3 4s., his fees for plans and making measurements and calculations for the building of a 45-quarter maltkin. Plaintiff stated that he received instructions for preparing plans for a 75-quarter and a 45-quarter maltkin, his remuneration to be at the rate of 2½ per cent. on the outlay. The larger kiln was carried out, but he had never been able to find out what was the cost of the erection. The 45-quarter kiln was abandoned, and it was in respect to consultations and attendance regarding this kiln that the action was brought. For the defence it was contended that it was never the intention of the defendants to erect more than one kiln, which was to occupy the site of an old one already in existence, at the time when plaintiff was first called in for consultation in July, 1876. He attended several times to take preliminary measurements and consult Messrs. Ash as to the probable cost of building, and the defendants then agreed to erect a 75-quarter kiln according to the patent of Mr. Free, of Manningtree, Essex. Two of the defendants, along with the plaintiff, went down to Essex to view the patent in operation, and plaintiff then drew out the plans and specifications for the kiln, which was carried out from those plans. £45 was deposited with him before the work was begun, and he had also received some moneys since. His Honour considered that plaintiff was not entitled to a verdict, as he had not prepared plans for the 45-quarter kiln in respect to which he was seeking to recover, and nothing definite appeared at any time to have been decided about it. He would, therefore, direct judgment to be entered for defendants.

Architects' Certificates. — Schulte and Another v. Hopkins and Others.—This case, tried in the Queen's Bench Division, before Justices Manisty and Bowen, on Tuesday, raised a question of considerable importance as to the conclusiveness of a certificate given by an architect, engineer, surveyor, or inspector, under a great mercantile contract. The plaintiffs are merchants at Hamburg, and the defendants are ironmasters at Middlesborough, in Yorkshire. In February, 1873, a contract was entered into between the parties for the sale by the defendants to the plaintiffs of 2,000 tons of wrought-iron rails, the price being £11 15s. per ton, and the price to be paid on inspector's certificate for such delivery of the iron. The contract was made subject to the condition that the whole of the rails should be subject to inspection, and every facility be given to the inspector for carrying out his instructions. By the contract, one per cent. of the rails was to be tested. After the delivery by the defendants of all the rails contracted for, the inspector, who was the engineer of the railway for which the rails were intended, and who acted in the inspection of the rails with the sanction and acquiescence of the plaintiffs, gave to the defendants a certificate that the rails were made in accordance with the contract. It was admitted for the purposes of the case that a considerable portion of the rails were not according to contract, owing partly to defects which could have been ascertained by inspection and testing, and partly to defects which could not have been ascertained either by inspection or testing. The defendants contended that the inspector's certificate was binding and conclusive on both parties, and precluded the plaintiffs from saying that the rails were not according to contract. The plaintiffs contended that, in spite of the certificate, the defendants were liable to the plaintiffs for the breach of the contract in not delivering rails according to contract, which, for the purposes of the case, was admitted to be the fact. The Court, after a long argument, gave judgment in favour of the plaintiffs, the buyers, on the ground that the contract did not expressly make the certificate final and conclusive.

The Unsanitary Dwellings in London.—Last week at the Guildhall, before Alderman Sir T. Gabriel and Mr. Alderman Nottage, several adjourned summonses were heard concerning the sanitary condition of certain houses in Ely-court, Holborn. The summonses were issued at the instance of Dr. W. S. Saunders, the medical officer of health for the City, on behalf of the Commissioners of Sewers, against the freeholders, leaseholders, and occupiers of eight houses in the court, to show cause why they should not be pulled down, as they were in such an unwholesome state as to be utterly unfit for human habitation. After a long discussion the Alderman adjourned the summons relating to No. 7 *sine die;* that relating to No. 11 to January 7th; and with respect to Nos. 8, 9, 10, and 12, made an order that these should be pulled down within six weeks.

Our Office Table.

At a general meeting of the South London Working Men's College, held on Tuesday evening, at the Horns Assembly Rooms, Kennington, under the presidency of Professor Tyndall, F.R.S., Mr. Wyke Bayliss gave a lecture on "The Study of Poetry and Art." The lecturer said art was not for the artist alone, but for all men, and helped to raise them from the pursuit of baser pleasures to the realisation of what is beautiful and true. Art was a message from the King to His children about the beautiful. Having traced the history of art from the earliest times, through the Classical and Mediæval periods, Mr. Bayliss pointed out that twice had this message of the beautiful been interpreted to the world by master minds—first, by the Greek, who fashioned the cold and senseless marble into every phase of beauty and life of which the human form is capable; secondly, by the Christian, in pictures of the saints and the representation of the passionate love of the religion of Christ. It might be added that the modern school of art had found a new life in the study of nature in all her varied aspects. Professor Tyndall expressed the gratification with which he had listened to Mr. Bayliss and watched the faces of those before him. The human mind was still intent upon the mastery of the hidden laws and principles which govern the various processes of nature. But man was not only endowed with knowledge and intellect, he was influenced by emotions, and here art, poetry, painting, architecture stepped in with their magic influences. Wisdom and understanding must go hand in hand with knowledge, and the emotions must influence the moral tone of man. Science, poetry, art combined to make man better and more complete.

The restoration of the Tay Bridge was last week before the directors of the North British Railway Company. Mr. Barlow, C.E., London, who was some months ago requested to prepare plans for the work, was in attendance. Though there are some details still requiring adjustment, the general features of the bridge were approved. It is proposed that the bridge shall be of sufficient breadth to admit of a double line of rails being laid, the extension being made on the west side of the old structure, where the bed of the river has been tested by means of boring by Mr. Barlow's assistants, with, as it is stated, the most satisfactory results. Another important respect in which the new structure will differ from the old is in the character of the piers. In regard to these, the only question has been as to whether they should be of malleable iron or brick; and it has now been determined that the latter material shall be used, so that in this matter the original designs, in which, it will be remembered, the specification was for brick, will be reverted to. The height will also be altered, by being lowered 11ft. In the arrangement of the girders, the old plan will be followed of laying the rails partly along the lower and partly along the upper booms, but a new feature will be the erection of a strong iron parapet along each side of the bridge.

A memorial to the Home Secretary on the subject of the Artisans' Dwellings Act was adopted at a conference of delegates from Metropolitan Vestries and District Boards held at St. Martin's Vestry, last week. The views expressed in the memorial were adverse to that Act, which, in the opinion of the Conference, should not be put in force until the provisions of Mr. M'Cullagh Torrens's Act had been exhausted by the local authorities throughout the metropolis. It was also urged that the cost of any operations under the Act should be borne by the parties interested and not by the ratepayers. A request is to be made to the Home Secretary to direct an exhaustive inquiry into the working of the Acts in question, and to give the delegates an interview on the subject.

Mr. Joseph Lucas, F.G.S., F.M.S., has published a pamphlet on the London Water Supply entitled "What the Ratepayers really want the Government to do." His conclusions are (1) That the Villager pays for quality; (2) That London has not yet spent enough money on Water to obtain a good article; (3) That London can well afford to go further afield in search of pure water; (4) That London does not know where to go for it; (5) That the Government ought to make a proper survey of the sources of supply, not only for London, but in the interest of the nation at large; (6) That when proper sources have been thus found, London still has a large margin left before spending so much on Water, in proportion to rateable value, as has actually been disbursed by many of our poorest villages.

On Saturday last, Mr. J. Gallimore, the Mayor of Newcastle-under-Lyme, entertained at dinner, in the Town Hall, the whole of the workmen employed by him in every branch of his extensive business as a builder. Mr. Gallimore presided, and, dinner over, Mr. H. Wilkes, one of the foremen, rose and said he thought they should at least be allowed to give the health of their respected and honoured employer. The proposition was heartily applauded, and the toast as heartily drunk. In response Mr. Gallimore said he had lately attended banquets of various kinds, and at none had he enjoyed himself more than on that occasion, because he was sure it truly represented the kindly feeling entertained by himself for his workmen, and by them towards him. Whatever success he had achieved in the trade—and, without boasting, he felt with their present machinery and appliances they stood second to none in the district—he had been enabled to accomplish it through his efforts being readily, ably, and faithfully seconded by his men. He trusted they would all be able to go on together and attain still greater success. He would do his best to obtain them work, and he hoped they would continue to enable him to get through it so as to win credit and give satisfaction. Some singing by the men heightened the enjoyment of the evening.

The annual meeting of the Lancashire and Cheshire branch of the Association of Municipal and Sanitary Engineers was held at Salford last Friday. The members assembled at eleven o'clock, and proceeded to Mode Wheel, where they were shown the concrete sewage tanks now in course of formation by Mr. Arthur Jacob, the borough engineer. Mr. Jacob explained the development of the drainage system of Salford, described the construction of the intercepting sewer from Broughton to Mode Wheel, and the nature of the works at the latter place. The works were commenced two years ago, and it is expected that another year will suffice to see them in full operation. The plans in the first instance were prepared by Mr. Alfred Fowler, late borough engineer, but they have since undergone considerable modification at the hands of the present engineer, Mr. Jacob, under whose supervision the works are now being constructed. A meeting for the transaction of business was subsequently held in one of the offices adjoining the Mode Wheel Works, under the presidency of Mr. A. Morant (president), borough surveyor of Leeds. Mr. R. Vawser, C.E., of Manchester, was re-elected district honorary secretary. In the afternoon a few of the members visited the Health Committee's depôt at Holt Town.

The announcements for the coming winter art season do not reveal any remarkable novelty. The old masters will again appear at the Royal Academy, and a special feature will be the series of designs by Flaxman which are to be lent by the authorities at University College. At the Grosvenor Gallery the usual water-colour drawings will embrace a representative collection of the modern French school, while the room that has upon previous occasions been devoted to studies in black and white will this year contain some specimens of decorative design by Mr. Burne Jones, Mr. Walter Crane, and other artists. Some of the smaller exhibitions have already opened their doors. The Fine Art Society has this year hit upon material that is likely to attract considerable attention. The work of Bewick, the wood engraver, holds an important place in the history of English illustrative design. His original drawings are shown side by side with impressions from the engraved blocks.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your Glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes, L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker. 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Ointment should be well rubbed upon the pit of the stomach and region of the heart in that particular form of indigestion which gives rise to palpitation, shortness of breath, and a suffocating sensation. Every distressing symptom soon yields, digestion becomes easy, the spirits light, and good health returns.

MEETINGS FOR THE ENSUING WEEK.

Saturday (to-morrow.)—Society of Arts. "Hints on House Decoration." By William Morris. 8 p.m.

Monday.—Royal Institute of British Architects. "Barracks." By E. Ingress Bell.

Wednesday.—Society of Arts. President's opening address. By J. Bramwell. 8 p.m.
British Archæological Association, "The Martin Tower, Tower of London." By C. H. Compton, and "Remains of a Roman Wall, Tower of London." By E. P. Loftus Brock, F.S.A. 8 p.m.

Thursday.—St. Paul's Ecclesiological Society. "Ecclesiastical Colours." By Rev. J. B. Powell, M.A. 7.30 p.m.

Friday. — Architectural Association. "The Use of Cements." By Gilbert R. Redgrave. 7.30 p.m.

CINDER-SIFTING ASH CLOSETS.
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TENDERS.

*** Correspondents would in all cases oblige by giving the addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Aylesbury.—For building additional cells at the head-quarters police station, and alterations to the deputy chief constable's residence, for Her Majesty's Justices of the Peace. Mr. W. F. Taylor, county surveyor, Aylesbury. Quantities supplied :—

Green, W. Y.	£407	9	11
Green, T.	389	4	0
Mayne and Son	364	0	0
Cooper, Geo.*	349	17	0

*For additional height of cells as required by Secretary of State, £40 3s. 0d. (accepted).

Ayr.—For the following works of decoration and furnishing at the new town-hall, for the corporation of Ayr :—

For painting and decorating :—
Wilcock, W., Ayr (accepted) ... £246 12 5
For stained-glass windows :—
Keir and Co., Glasgow (accepted) ... £233 3 6
For ironmongery :—
M'Gloch and Co., Glasgow (accepted) £101 7 0

Birmingham.—For the erection of three-story workshops, &c. Mr. Ewen Harper, architect. Quantities supplied by the architect :—

Dowse	£983	0	0
Rowbotham	939	0	0
Price	899	0	0
Hyde	874	0	0

Birmingham.—For the erection of a villa at Penns, near Birmingham. Quantities supplied by Mr. Ewe Harper :—

Taylor	£1,750	0	0
Smith and Son	1,350	0	0
Hands	1,295	0	0
Rowbotham	1,249	0	0

Brownhills, near Walsall.—For the erection of new public offices, assembly-room, and surveyor's residence, for the Brownhills local board. Mr. J. Siddalls, architect. Quantities supplied by the architect :—

Cresswell, T. and E., Walsall Wood (accepted) £2,700

Dartford.—Revised tenders for a new classroom at St. Alban's-road school, for the Deptford School Board :—

Gumbell, W.	£245	0	0
Waller, T.	234	0	0
Waite, W. (accepted)	134	15	0

Exeter.—For house in Polsloe-road, Exeter, for Mr. J. Sampson. Mr. E. H. Harbottle, A.R.I.B.A., architect, County Chambers, Exeter :—

Gibbard, J. R., Exeter	£1,304	16	0
Crocker, R. J., Bristol	1,300	0	0
Luscombe and Son, Exeter	1,250	0	0
Bowden, Barnstaple (accepted)	1,200	0	0
Gibson, W., Exeter	1,120	0	0

Ealing.—For new dormitory, &c., Ealing House, Girls' Industrial Home, for Mr. W. Williams, and the committee. Mr. E. P. Loftus Brock, F.S.A., architect :—

Grover, F. (accepted in part) ... £1,195 0 0

Green Lanes.—For the erection of houses at Stanley-road, Harringay New Park, Green Lanes, for Mr. G. Barter. Mr. W. Sckham Witherington, architect, 79, Mark-lane :—

For five houses :—			
Whale	£2,335	0	0
Taylor and Parfitt	1,990	0	0
Partridge and Henderson	1,545	0	0
Coney, Liverpool-road	1,490	0	0
For ten houses :—			
Whale	4,640	0	0
Taylor and Parfitt	3,780	0	0
Partridge and Henderson	3,000	0	0
Coney	2,940	0	0

Highbury.—For making up Highbury quadrant, for the vestry of St. Mary, Islington :—

Williamson, H.	£1,250	0	0
Rutty, G. G.	1,050	0	0
Walker, A.	985	0	0
Jackson, F. A. and Son	945	0	0
Irons, W.	913	0	0
Bell, J., Wood-green (accepted)	737	0	0

Hednesford.—For alterations and additions to West Hill Schools, for the Cannock School Board. Mr. Benjamin Baker, architect, Willenhall. Quantities by the architect :—

Butler, Darlaston	£2,379	10	0
Tildesley, Willenhall	2,190	0	0
Punfield, Willenhall	2,173	0	0
Watton and Sons, Tamworth	2,163	16	8
Whittome, Stafford	2,149	0	0
Lovatt, Wolverhampton	2,100	0	0
Jones and Sons, Sedgley	2,095	0	0
Grosvenor, Stafford	2,070	0	0
Bedford, Wolverhampton	2,050	0	0
Bennett, Birmingham	2,033	0	0
Bradney & Co., Wolverhampton	1,995	0	0
Barton, Hednesford	1,994	0	0
Teece, Darlaston	1,927	0	0
Guest, Stourbridge (accepted)	1,825	0	0
Tracey, Stafford	1,801	0	0

Hoxton.—For alterations to "White Hart" public-house, Hoxton-street, for Mr. E. J. Rose. Messrs. Wilson, Son, and Aldwinckle, architects :—

Marr	£1,795	0	0
Hearle	1,775	0	0
Cocks	1,770	0	0
Andrews	1,757	0	0
Shurmur (accepted)	1,638	0	0
Palmer	1,497	0	0

Hull.—Accepted tenders for shops and warehouse, Bridge-street, Hull. Messrs. W. Botterill and Son, architects. Quantities not supplied. Iron columns, girders, &c., and all ironmongery supplied to contractors free of cost by the proprietor :—

Excavators and bricklayers :—
Drury and Harper, Hull.
Stonemason :—
Sweeting, F., Hull.
Carpenter and joiner :—
Lison, W., Hull.
Plumber, &c. :—
Halliday, J., Hull.
Slater :—
Hunter, E., Hull.
Painter :—
Lowthrop, E. J., Hull.
Total amount £1,331 2 0

Lanark.—For the construction of a reservoir at Lochlyoch, for the police commissioners. Mr. Watson, waterworks engineer :—
Wilson, W., Bothwell (accepted) £1,885 8 2

Launceston.—For the erection of municipal buildings, for the town council :—
Conglon, C. (accepted) £1,265 0 0

Llantrissant.—For the restoration of Llantrissant Church, Mon. Mr. E. A. Lansdowne, architect, Newport, Mon. :—

Howard, E., Cardiff	£680	0	0
Jones and Son, Newport	547	0	0
Linton, J., Newport	520	0	0
Richards, Newport	490	0	0
White, Abergavenny	488	0	0
Burgoyne, Blaenavon	475	0	0
Morgan and Evans, Pontypool	459	0	0
Giles, E., Pontrilas	455	0	0
Blackburne, Newport	433	0	0

Lewes.—For surveyor's office at White Hill, for the borough commissioners :—
Knight, J. (accepted) £43 10 0
[Lowest of eight tenders, of which the highest was £60.]

London.—For the superstructure of the City of London Schools, for the Court of Common Council. Messrs. Davis and Emanuel, architects :—

Mowlem, J. and Co. (accepted) ... £76,438 0 0
[Lowest but one of 14 tenders, of which the lowest and one other did not comply with the conditions.]

London.—For additions and alterations to No. 87, Tottenham Court-road, for Messrs. Menegilli and Co. Mr. Charles Sewell, architect :—

Bolding and Son	£849	0	0
Stimpson and Co.	848	0	0
Pack, Bros.	716	0	0
Neighbour and Scott	617	0	0

London.—For additions to premises, Love-lane, City. Messrs. Ford and Hesketh, architects :—

Simpson and Sons	£22,891	0	0
Colls and Sons	20,604	0	0
Scrivener and Co.	20,535	0	0
Kirk and Randall	20,467	0	0
McLachlan and Sons	20,249	0	0
Shaw, G.	20,243	0	0
Perry and Co.	20,182	0	0
Adamson and Sons	19,988	0	0
Peto, Bros.	19,707	0	0
Brass, W.	19,531	0	0
Conder, R.	19,390	0	0
Lawrance, E.	18,896	0	0

London.—For alterations to "Weavers' Arms" public-house, London-wall, for Mr. Sheen. Messrs. Drury and Lovejoy, architects :—

Hockley	£449	0	0
Marr	408	0	0
Shurmur (accepted)	396	0	0

London.—For foundation, &c., of proposed new building, Thames Embankment, for S. Parry, Esq. Messrs. Fowler and Hill, architects :—

Kellet and Bentley	£3,689	0	0
Killingback, C.	3,596	0	0
Batch, J.	3,354	0	0
Cooke, B.	2,700	0	0
Dickinson, C.	2,688	0	0
Crockett, W.	2,558	0	0
Kirk and Randall	2,519	0	0
Reddin, E.	2,460	0	0
Bell, J.	2,354	0	0
Ford, J. and Co.	2,339	0	0
Prout, W.	2,195	0	0
Cardus, J. (accepted)	1,979	0	0

Lower Norwood.—For the erection of a villa at Lower Norwood, Surrey, for Mr. G. Shrewsbury. Mr. E. T. Shrewsbury, architect. Quantities supplied :—

Woodbridge	£989	0	0
Goad	965	0	0
Silver	940	0	0
Crabb and Son	933	0	0
Jenkins	925	0	0
Bowyer, T. & C.	877	0	0
Pack, Bros.	849	0	0
Taylor (accepted)	846	0	0

Marylebone, W.—For laying the grounds of the new infirmary, including wood-paving for the same, for the Marylebone board of guardians :—
Wall, Bros. (accepted) £2,431 0 0

Newark-on-Trent.—For alterations and additions to building, and converting same into two residences, for Mr. Thos. Hunt, Eldon-street, Newark, Notts. Mr. R. W. G. Hayward, architect and surveyor, 6, Bar Gate, Newark. Part material provided by proprietor :—

Dobney, Newark	£198	0	0
Crossland, Newark	197	10	0
Lane, Newark	160	0	0
Cosham, Newark (accepted)	149	0	0

Poplar, E.—For paving and making-up new roads, for the Poplar district board of works :—

For Reeve's-road :—
Knight, D. £462 0 0
For Tibbatts-road :—
Knight, D. 322 0 0
[Lowest tenders received for either.]

Richmond.—For erection of public baths, Richmond, Surrey. Messrs. Geo. Elkington and Son, architects, 95, Cannon-street, E.C. Contract No. 1. builder's work :—

Perry and Co.	£7,280	0	0
Crockett, W.	7,223	0	0
Drake, T. and F.	6,995	0	0
Reynolds and Co.	6,850	0	0
Prout, W.	6,797	0	0
Higgs, F.	6,750	0	0
Julian and Co.	6,650	0	0
Bowyer, J. and Co.	6,478	0	0
Priestley, R. W.	6,440	0	0
Sweet and Loder	6,346	0	0
Osborne, J. J.	6,327	0	0
Augood, J.	6,300	0	0
Battley, R. J.	6,273	0	0
Beale, W. J.	6,090	0	0
Watson, W.	5,880	0	0
Pack, Bros.	5,593	0	0
Bull, Bros. and Cooper	5,493	0	0
Lucas, J. M.	4,228	5	3
Contract No. 2. Engineer's work :—			
Clarke, F. J.	2,068	0	0
Fraser and Fraser	1,872	0	0
Benham and Sons	1,735	0	0
Rosser and Russell	1,699	0	0
Reynolds and Co.	1,600	0	0
Fraser, W. J. and Co.	1,580	0	0
May, J. and F.	1,550	0	0
Goddard and Massey	1,494	0	0
Hamilton, Wood, and Co.	1,388	0	0
Bradford, T. and Co.	1,369	0	0
Chadderton Ironworks Co.	1,150	0	0

St. Martin-in-the-Fields.—For alterations and additions to almshouses at Bayham-street, Camden Town. Mr. Henry Jacques, architect. Quantities supplied :—

Shaw	£5,850	0	0
Mowlem and Co.	5,714	0	0
Manley	5,557	0	0
Laing and Son	5,435	0	0
Rider and Son	5,380	0	0
Howard and Dorrell	5,280	0	0
Dove, Bros.	5,155	0	0
Adamson	4,975	0	0
Wall, C.	4,950	0	0
Clemence	4,947	0	0
Toms, Camden Town (accepted)	4,459	0	0

Streatham.—For the erection of residence, Streatham Park, Surrey, for W. L. Hooper, Esq. Messrs. Osborn and Russell, architects :—

Boweyer	£2,595	0	0
Brown	2,569	0	0
Wontner, Smith, and Co.	2,479	0	0
Woodward	2,404	0	0
Jarrett	2,396	0	0
Tongue	2,360	0	0
Sabey and Son	2,329	0	0
Barnes	2,300	0	0
Jerrard	2,298	0	0

Upton.—For two cottages at Upton, Essex. Mr. J. Moore Smith, architect, 121, Bishopsgate-street, Cornhill, E.C., and at Stratford :—

Waterman	£639	0	0
Webb, J.	579	0	0
North, Bros.	565	0	0
Baxter, J.	540	0	0
Martin, W. H.	539	0	0
Brown, H., Stratford (accepted)	525	0	0

Wolverhampton.—For the construction of a sluice at the lake, for the town council :—
Norman and Co. (accepted) £86 10 0

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THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 19, 1880.

IS ART THE IMITATION OF NATURE?

It will soon be a generation ago—as the chronologist reckons generations—since the world first heard the oracular statement that "Art is the expression of man's delight in God's work." The announcement at once captivated people of all sorts and kinds. The well-meaning religious classes were impressed with the seeming piety of the assertion; while the literary and cultivated class were overpowered by the brilliancy of the style in which it was set forth. Only those persons—few and far between at that time—who happened to know something about art from their own personal study of it, hesitated to give their assent. They were in a hopeless minority, and the world went its way without them. If, as they said, no previous art could be found which was simply the expression of men's delight in Nature, then it was quite time, the majority thought, to make new forms of art which should be. They set about it; and the result will long remain to nauseate every beholder. In architecture, we are at last escaping from it; but it may make the escape more sure if we look back at the reasoning which misled so many, and consider calmly how much of truth and how much of falsehood there has been in it from the first.

It must be allowed at starting, indeed, that the persuasiveness of this, as of Mr. Ruskin's assertions generally, does not lie chiefly in the reasons he gives for them. When the so-called electro-biologist tells his "subject" that the water he is drinking is champagne, or that the umbrella he holds is a red-hot poker, the instantaneous belief he produces is not the result of argument. It is produced, Dr. Carpenter tells us, because the mind of the biologised subject is entirely dormant: because he is powerfully impressed by the authoritative tone of the operator; and because, having suffered himself to become a mere thinking automaton, he is given up to the domination of any idea which may be strongly suggested to him. So it has been with a multitude of Mr. Ruskin's readers. His first condition for operating on them is that they should submit their minds and wills to his; and this done, he can give them an ardent relish for ditch-water, and a deadly fear of something harmless as a gingham umbrella. The man who can do all this by the mere fascination of style is, doubtless, an extraordinary one; but the mental benefit to his followers is little greater than that which accrues to the "subjects" of the professional mesmerist. A mere conscious following of rules, as Mr. Ruskin himself sees clearly enough, will never make anyone an artist, even were the rules unalterably true and universally applicable. Every real artist, from the greatest to the least, does his work as seems good to himself. Done thus, it is natural, organic, homogeneous, which it never can be if he tries to do it only as shall seem good to someone else. It may be high or low, strong or weak; but if it shows forth the worker's personality, it will fill a place in the world which would else be empty. All individuality is valued, sooner or later; the only worthless thing is copyism of others. If, therefore, it were as certain as it is questionable that art is the expression of men's delight in Nature, to make the statement would help no one to be an artist. It would only urge one set of people to self-examination, and another to self-deception. The one class would be always asking themselves, "Is this line or this colour found in Nature?" and if not, would be forbidding themselves its use, in spite of a clear perception that it was the right thing for the place. The other class, feeling an honest pleasure in natural objects, would delude themselves at once into the belief that they were real artists, though, all the while, art might be as impossible to them as Nature was delightful. Art is a living thing, and all these books which attempt to dissect it and tell us what it is composed of, do not bring us nearer by a moment or an inch to the making it live again.

But though, for the practical worker, a true account of the laws by which he ought to work might have little help in it, a false statement of them may have much hindrance; and it is, therefore, worth considering how far this particular definition is borne out by facts. The definition, as Mr. Ruskin and his followers understand it, amounts to this: that all good art is an imitation of Nature. And they not simply mean—what may very often be true—that the works of man have to be designed on the same principles as the works of Nature. This, in many cases, they must be, without any wish for imitation at all. When, for instance, an engineer builds a factory chimney widest at the base, and tapering upwards, he does not do it in imitation of a pine-tree or an oak-tree, although they do the same; it is simply that the pine-tree and the chimney both have to stand against storms and tempests, and that this is the best way of making them stand. The works of Nature and the works of man have to exist amongst similar mechanical conditions, and the best way of dealing with the conditions having long ago been found out, so to speak, by Nature, men coming later, must often either seem to imitate Nature, or must put up, for the sake of not imitating her, with some other way which is quite inferior. This simple fact is at the bottom of an immense number of the so-called imitations on which Mr. Ruskin and his disciples rely so confidently. It explains a great part of what Mr. Garbett, in that singular mixture of suggestive thought and incredible paradox which makes up his work on "Design," has called "generalised imitation." But this—the mechanical necessity by which Nature and man, working in the same world, and contending in each individual work with the same general forces, are alike constrained—does not, as we are quite ready to admit, by any means exhaust the subject. No one can deny, or wish to deny, the large part which the intentional copying of Nature has played in many architectural systems. But what we do deny is, that this copy is essential to art; that no art is good which refuses to copy Nature; and above all, that the art is highest which copies Nature most closely. Three propositions more flatly negatived by the past, and more fraught with mischief to the future, could scarcely be put forward.

Mr. Ruskin's method is to take some architectural form, and placing beside it a natural form bearing some general resemblance to it, to assume at once that the one owes its beauty to being a copy of the other. The first thought which strikes his readers, as soon as calm reflection leaves them capable of thought, is that the variety of nature, even as we see it in this one world, is so nearly infinite, that it is difficult to devise any simple form which Nature, somewhere or other, has not devised before us. But how does this afford the slightest proof that the having been done before is the cause of its beauty? An architect, we will say, invents a new type of conventional foliage, like nothing that grows between the Equator and the Poles. Not being imitated from Nature, Mr. Ruskin and his followers are bound to visit it with their severest condemnation. But now suppose that some geologist finds in the coal-measures or elsewhere the same identical type in a fossil fern; the form which, a moment before, was "hateful, horrible, not to be borne," becomes at once beautiful, noble, and precious. What sort of principle is this, which condemns the same thing to-day and applauds it to-morrow? It is a trick little better than that by which sensational review writers judge of architecture—by ascertaining, namely, which buildings are old, and which are new—and then smothering the former with unintelligent praise, and the latter with unintelligent abuse. Again, though Nature offers to our view here and there almost every possible variety of line and curve, and since, therefore, it often approaches a mathematical impossibility to use forms which she has not used already, it is worth notice that the highest styles of architecture use most the forms which Nature uses least—straight lines and circular curves. The columns in a Greek temple, it is true, have varying curvatures in their entasis; but all the other main lines are straight, or have subtle corrections intended to make them look straighter than straightness itself. The tracery in an Early Gothic church may, or may not, have been suggested by leaves and flowers; but every line of it, in the best examples, is circular or straight; though Nature hardly exhibits a straight line save in the distant horizon at sea, and hardly a circle save in the sun or moon above it. It is not styles in vigour and purity, but styles in the last stage of debasement and decay, that come nearest to nature in their use of lines. The decaying Greek introduced the closest imitation of foliage; the decaying Gothic substituted ogee curves for straight lines and circles; and the decaying Renaissance, in its Rococo and other forms, like Nature herself, nearly got rid of them altogether. It would not be difficult, in short, to give plausible reasons for reversing Mr. Ruskin's assertion, and for avowing that the more closely an architectural style keeps to Nature, the more surely it has arrived at the period of disease and dissolution.

We have no wish, however, to utter so hard a saying as that the architect should avoid imitating Nature. Our purpose is rather to propose a "working hypothesis" which may be tested by its application to the past and its adaptability to the future. It is briefly this: that the indispensable part of art is *arrangement*, and that the things arranged may be either natural objects, copies of natural objects, invented forms, copies of invented forms, or mixtures of these in various proportions. To arrange natural objects with a view to making an artistic whole, is a form of art, but a low one. Savages do it with shells and feathers, and bedding-out gardeners with geraniums and calceolarias. To arrange copies of natural objects so as to make an artistic whole, is a higher thing, but by no means the highest. Still, a great degree of skill may be employed in making the copies, and this skill is what the public in general mistake for art. As regards form, however, a photographic camera would have done it better; and even as regards colour also, it may, perhaps, do it better some day. This, such as it is, is the art of most modern painters and sculptors, and, as far as feeble naturalistic carving could make it so, has been the art of some minor architects also. The art which both invents noble objects and also arranges them is the highest of all, and though it comes out in the best periods of architecture more unmistakably than anywhere else, it characterises equally the greatest works of poetry, of painting, and of sculpture. By its constitution, indeed, architecture, like music, may be said to be a creative art, while the three just named are mainly representative arts. But the supreme masters of them, scorning to be content with the mere copying of Nature, and ever striving to invent something superior to Nature, have made them creative too: and by their creation rather than by their copyism, have gained for themselves an everlasting name. Homer and Milton did not describe the men they saw around them; Phidias and Raphael did not carve and paint their everyday contemporaries; it was because they created something nobler than the work-a-day world that this very world refuses to forget them. And in architecture this is truest of all. The ages in which architecture seems to have been inspired were those in which it copied least and created most. There is no close copying of Nature in the Transitional and First Pointed styles: this came later, when the inspiration was fading, and when there was soon to be an end to the glory and the dream. The fourth species of art—that which arranges copies of invented forms, or, in other words, copies of human work—occurs at nearly all periods, mixed with the other species in various proportions. In representations of drapery, for instance, it plays a very important part in painting and sculpture, and a part which does not seem to have been at all uncongenial even to the greatest artists in those departments. In poems, from the "Iliad" downwards, descriptions of human work are only less frequent than descriptions of human nature; while, in architecture, from the best and purest, down to the latest and most degraded styles, human workmanship is the one and only thing that never ceases to be copied. Mr. Ruskin, indeed, in summing up the history of Gothic art, tells us, in effect, that there was "progress as long as men copied God's work, and decline as soon as they copied their own." To contradict such a pietistic utterance looks half-irreverent: but truth is never irreverent: and the truth is, that men copied human work as much in the first and purest Gothic period as they did in the last and feeblest one. What is every jamb-shaft of an Early English doorway, but a copy, for ornament's sake, of that human invention, the column? What is every canopy, but a copy of that other human invention, the gable? What is the head of every light in the earliest tracery windows, but a copy of that third human invention, the arch? and would the architecture have been better had this been—as in Late German work it sometimes is—a copy of two interlacing boughs instead? What is the ornament which covers the south spire at Chartres, both spires at Coutances, and a multitude of spires and pinnacles elsewhere, but an imitation of roofing-tiles? We might fill pages with a list of the human works which are copied as ornaments in Romanesque and Early English buildings: and a consideration of the whole subject would probably show that the vice of the later styles did not lie so much in copying human works for ornament, as in copying masonry details for woodwork, and outside details—like buttresses and pinnacles—for inside decoration.

If, then, we take Mr. Ruskin's assertion to mean that true art consists in the accurate copying of Nature, it may safely be said that a more misleading doctrine was never set forth with equal eloquence. The mere copying of Nature is, in strictness, not art at all. Art comes in when natural facts are condensed, generalised, and arranged; and still more when great inventions—not in Nature, and yet after the manner of Nature—are grouped into a noble whole. The imitation of Nature which is traceable in the highest work is not such a crude and childish thing as the tracing-off a leaf-edge, or a mountain profile, and making it into a moulding or a vase. It is a working in the spirit of Nature, and the filling our work with the highest thing in nature—life. The earliest and purest part of every great style is full of life. Even where its ornament is a suggestion of nature—as in foliage-carving—it does not copy, and is not meant to copy, any one natural form. But it has all the life of nature, and often more by far than Nature is apt to show us. It seems growing as we look at it, and ready to push upwards, rather than to sink under, the features it supports. It is the same with human and animal sculpture, both Gothic and Greek, in the early times. But soon there comes a cry for something more natural, more commonplace, more on the general level. The sculptor yields to it, and finds ease and popularity united. Instead of inventing architectural foliage, he copies natural foliage; he gives up striving at life, which is hard, and carves grapes and strawberry leaves, which are popular and pretty. He knows himself to have sunk, though the crowd assures him he has risen; and while he and his style go on the downward road together, it is amidst a universal chorus that the true and only end of art is to make the closest possible copy of Nature.

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CONTRACT WORK AND LOW TENDERS.

A GLANCE at the weekly lists of tenders leads to the pretty safe assumption that the lowest tenderer is the successful competitor. Cheapness is still the consideration which rules in building, over all others; but, unfortunately, this cheapness is bought dearly. Everyone who builds nowadays, appears to adopt the maxim of getting as much as he can for his money, rather than the more moderate and reasonable course of *reducing* his requirements to the least he can do with. He wants the most expensive luxuries, but he is willing only to pay the price of the cheapest labour in the market, and herein, we take it, lies the root of the modern contract system.

In old times, when the workman never aspired to become a master of all trades, or to combine them all into one, like a "contractor," each trade found a separate existence; it asserted itself in the building, and really formed a separate contract. The old work we now so fondly imitate was done in this manner; each artificer had a personal interest in the building. Then the bricklayer was not a roving tradesman going from one locality to another in quest of work, and endeavouring to obtain the shortest hours and the highest wages, but a workman who could always obtain a fair wage for his skilled labour. There was very little "scamping," and no cheap tendering. So it was with the carpenter, the joiner, the mason, the smith, and the plasterer. We are not saying it is the workman's fault: he cannot help himself nor the age; he is in the hands of those of his craft who have given up work, who think it is more respectable to take a middle position and become agents between employer and employed than to work themselves. Contracts for a "lump" sum have been found convenient, and hence has sprung up the "contractor," who prefers to buy the labour of others in the cheapest market, and to sell it in the dearest. This individual's position is no fault of his own; he simply supplies a demand, and the evil must be sought nearer its source—the desire for cheapness on the part of the client. Again, that workman is most thought of who can turn his hand to a variety of labour, not him who feels a pride in his skill as an artist. The acceptance of the lowest tender has created this state of things; it is the tender, not the work, that is regarded by the bulk of those who employ labour; on the other hand, the average workman estimates the value of his work by the price he can get for it, not by the time and thought expended on it, nor even by the old scale of prices, which were based on the cost of materials and workmanship with a fair profit. How seldom a tradesman or builder, for example, when he is asked to give a tender, will go to the trouble of finding the quantity of material, the number of bricks, and their cost per thousand, the cost of sand and lime, and the quantity required to cover a certain area of wall; he will content himself with a rough and ready mode of measurement, based on the time it will take to do work of the kind. In the carpenter's work, he will seldom ascertain the cost of timber per foot cube from the prime cost at the timber-yard, adding the sawing and carting, but he will roughly estimate by the "square" for the floors and roofing. The result of all this is plain. Workmanship, in such hands, must deteriorate, for it has lost its original significance.

Architects have shared the degeneration. They seek and accept work on the same footing, and competition—or at least the abuse of competition—among them has opened the door to a large class of men who manufacture designs for others. We talk about art; but, after all, there is not much of it left after the cheapest design has been accepted and the lowest tender carried out. The architect smothers his design with ornament to make it successful, while the builder has to reap a profit upon a tender which is frequently insufficient to erect the bare carcase. Can we wonder at the result, after this double process of cheapening? Then the payment of the professional architect is an artful device to secure quantity rather than quality. If he can add a few thousands in decorative accessories, so much better is he paid; but in the same degree the contractor suffers, or, more generally, the building itself. Low tenders will always be accepted; but the architects who profess allegiance to the by-laws of the Institute might set a higher standard by adopting a rule to the effect that they decline to accept any tender which is more than a certain percentage below their own protecting estimate. If architects would use more discretion, and refuse to accept a tender which they know must either ruin the contractor or entail increased trouble or bad work, they would be helping a reform that would improve their own position by lessening their responsibilities and promoting the value of their own designs, not for the amount of work, but for its excellence. If they ceased to employ workmen for their tenders instead of for their work, they would be inaugurating a new system of labour by giving back to the artificer the interest in his skill he is now deprived of. No man will do good work at a loss, and it is the duty of the profession to strengthen the hands of the working artist, so as to make him feel that the interests of architect and artificer are identical. If manufacturers and large employers of labour were also to adopt a co-operative scheme, by which the workman might derive some profit from the increase of the business, as some fair proportion of the profits, we might expect to see a return to the spirit of true art, and a step made towards the rectification of the limits which now divide labour from capital. It may be contended that contract work relieves the architect of a great amount of attention to details; but the experience of those who have supervised low contract work is disappointing. A skilful joiner, for instance, under the old system will relieve the architect of an immense amount of labour; but, under the contract or lump system, the responsibility is shared with a dozen other workmen, or rests entirely upon the contractor, who has no direct personal interest in another man's labour. At present each man's work is another's profit, the artificer is reduced to a mere tool, and the only chance of his success is the renouncement of his art for the gains to be derived on the barter of the work of others. This is a traffic in labour of which the result is bad work and dissatisfaction to all concerned.

THE ENGINEERING EXHIBITION AT ISLINGTON

THE Exhibition of Engineering, opened last Monday, at the Agricultural Hall, Islington, is a good step towards the promotion of a popular interest in engineering appliances. Taking first a few objects of more particular value to the architect and builder, we find several exhibits of worth. In the main avenue, we observe, near the entrance, " Munn's Exhaust Ventilators and Smoke Cowl," manufactured by J. Mc Haffie and Co., of Glasgow, in which an arrangement of plates or louvres, placed horizontally, secure the object of creating an up-current. The inventor claims superiority over those cowls which have vertical louvres, and which are alleged to act only when the wind blows horizontally; and the present invention is said to answer equally upon chimneys obstructed by higher buildings, or when the wind sweeps down over an obstruction, as a roof. The specimens show a somewhat heavy projecting head, octagonal, hexagonal, or circular in shape, made of galvanised-iron, painted. Near them we find a rather clever adaptation of the lattice principle, by Maryon and Co., Bickerton-road, N. It is a self-acting shutter for shop or private windows, and can be easily pulled up or down by the aid of a counterweight. A conspicuous stall in the middle avenue is occupied by Messrs. Moser and Sons, of High-street, Borough, who send samples of iron and steel, and a large assortment of engineers' tools. Messrs. Moser's chief exhibit is the H.P. Nugget, an iron possessing great tensile strength and ductility. We saw some fine wire made from it, drawn from No. 14 to No. 35 gauge, without annealing. The specimens of cast-steel welded to iron, the planing and drilling machines, vices, and lifting-jacks, forges, and a host of other mechanical tools, are well worth inspection for quality and workmanship. Another striking stall in the main avenue is that occupied by Messrs. Boyle and Sons, of Holborn Viaduct and Glasgow. We find an assortment of Messrs. Boyle's patent "Self-acting Air-pump Ventilators" in several patterns, an apparatus too well-known by our readers to need description. The square and circular forms shown are admirably suitable, and do not mimic mere architectural features, though they can be adapted to suit any style of building. One is a large Gothic ventilator in the form of a turret or flêche ; but they are made of all sizes, suitable for large churches, halls, schools, dwelling-houses, billiard-rooms, hospitals, warehouses, varying in price from £150 to £3 10s. Specimens also of soil-pipe ventilators are exhibited. One 10in., for 3 to 4in. soil-pipes ; double-action soil-pipe ventilators, chimney-cowls for preventing blow-down, smoke-extractors, &c., is displayed, and Boyle's system of sanitation can be intelligibly explained by the models exhibited. The " inlet" shown in the form of a small pilaster of wood or iron 6½ by 3in. in the aperture, and 5ft. 8in. high, with valve for regulating supply, for the admission of air in buildings, will commend itself to all architects ; it is in fact the application of what is known as " Tobin's system," and the upright tube may either be concealed or shown, to suit any style of internal decoration. There are various other sanitary appliances, which it would be impossible for us to mention here, though we strongly recommend a visit to stand No. 24. Messrs. S. & E. Ransome and Co., of Essex-street, Strand, have a large display of hoists, self-sustaining rope-pulleys, and other useful mechanical aids to the builder and contractor, and we must not pass by Samuelson and Co.'s moulding machine, which may be seen in operation, the advantages of which are that, by the perpendicular raising of the pattern plates, accuracy of casting is insured, and mending of the mould avoided. Messrs. Smeaton and Sons have a large collection of their " Eddystone closet with trapped overflow," and their new " plug-valve closet," made of one piece of earthenware. The cast-lead Eclipse trap is a decided improvement on the old D-trap, and in truth combines the advantages of the clean-flushing action common to the siphon-trap, but does not siphon out as the latter is apt to do. We see also a good bath with shower combined.

Those who are engaged in solving the important question of smoke-prevention will do well to inspect Mr. A. C. Engert's ingenious models of apparatus adapted for furnaces, by which means the ordinary furnace can be fitted with a kind of hood or shutterregulating the admission of cold air, and thereby preventing smoke. Various kinds of stoves for heating are exhibited ; we may ospecially draw attention to Messrs. Ewart and Sons' (Euston-road) " Crown Instantaneous Water Heater," by which boiling water can be quickly obtained for domestic purposes, their " Amethysta or pure air-stove," smoke-preventer, baths, &c. ; and Mr. Harry Hunt's anthracite-coal stove, for halls and dwelling-rooms, a very attractive looking stove, with open fire. It is an American invention, and is called the " Crown Jewel." The smallest stove (No. 21), consumes 37lb. of anthracite coal in 24 hours, and there is said to be no unpleasant smell. Other exibits in the same class are Webster and Co.'s gas-stove, and Cornforth's smoke-consuming, cooking, and domestic apparatus, made in Birmingham.

Spence's metal for jointing gas and water-pipes, and for making moulds, is worth remark for the sharp castings produced in cement, concrete, plaster, &c., and several medallions and panels are shown by the inventors, Messrs. Spence, of Lombard-street. Architects and others who are seeking to introduce light in dark cellars, basements, and corners, will feel interested in Messrs. Hamilton and Co.'s (Leadenhall House, E.C.) display of prismoidal pavement and floor-lights, various kinds of which are shown. Vertical and side-light can be obtained simultaneously by their use; the lenses are hexagonal and rectangular in shape, and are, by a well-known optical principle, made to reflect light at any required angle. Their illuminating stall-boards, and equilibrium-motion pavements, are admirable inventions suited for all business premises, and the stand of the manufacturers at the exhibition, is well worth a visit.

Turning to mechanical appliances, the scientific visitor will be struck with the working model running on rails along the floor of hall, showing an improved continuous footboard for railway carriages, exhibited by J. Taylor and Co., of Leadenhall-street. The footboard is hinged on pivots supported by brackets, and can be operated by the guard. When the doors of a carriage open, it assumes the horizontal position, and covers the space between carriage and platform, preventing thereby the frequent danger to passengers slipping between. As the doors close the footboard assumes a diagonal position, and throws off all wet and snow. It can be easily fixed to any carriage. Mr. W. Bevitt, Romford, is the inventor. Mr. J. Hardinge, of Brixton, exhibits a variety of ingenious models, among them, a woodworking machine for mortising, mitring and tennoning at any angle ; a beautifully turned-out working model of locomotive passenger-engine in glass case ; a clever nail-driver with floor-cramp ; and a perfect model of engineers' factory, with every machine, appliance, and tool.

The Reading Iron Works show a 10 h.-p., horizontal engine, and a 3 h.-p. engine in combination with a patent nozzle vertical boiler, one feature of which is that the bed-plate and main crank-shaft have a bearing in one cast piece ; the Lubricative Packing Co., also exhibit their " special" horizontal engine, the "Launch" engine, water detector, gully-traps; and Hodson's high-speed direct-acting rotary pump, by Mr. N. Earle, of Cannon-street, deserves mention as a useful and ingenious contrivance for driving electric-lighting apparatus, &c. The visitor should not miss Messrs. Crossley Brothers (Manchester), working "Otto" silent gas engine, an admirable substitute for steam-power, avoiding boiler-explosions and well adapted for printing, organ-blowing, and sundry purposes ; Hulme and Lund's noiseless steam-pumps, the "Water Witch" pump, shown by Blundell Brothers, of Limehouse ; the emery wheels and labour-saving machines of Thomson, Sterne, and Co., of Glasgow ; Vernon and Ewen's patent multitubular boiler, for presenting large heating surface, and claiming rapidity in generating steam besides freedom from incrustation, also their ventilating manhole, and street gully ; Asquith's drilling and boring machines ; Bateman's models of steam-engines and metal-fire stove ; Ellis's friction hoist ; Wizzel's hydraulic engines &c. ; David Hart and Co.'s weighing machines without loose weights ; Schaffer and Badenherz's (Glasgow and Manchester), hydraulic gauges, engine-fittings, &c. At the upper end of the hall, C. W. Meiter and Co., of Gracechurch-street, display a number of Col. de la Sala's " folding, unsinkable boats, canoes, &c.," a clever invention suitable for either sporting, pleasure, or exploration purposes. C. Kite and Co., Chalton-street, N.W., have a collection of ventilators for factories and houses, and smoke preventing caps ; the ridge ventilator is a good form for stables, workshops, &c. Balmain's luminous paint is shown in a small room. Among other objects of a general class, we meet with apparatus for air-heating by Ewart and Son ; workshop appliances, band-saw machines, by Lusty and Co. ; a clever chimney-sweeping apparatus by W. Ross ; domestic appliances by J. Beesley ; electric light apparatus by J. Hardinge ; tools and forges of all descriptions, hoists, gas-making apparatus, wood-working machines, and a variety of contrivances which it would be impossible to describe in this notice. We are sorry the catalogue is not a classified one ; but there is one feature in it worth recording, namely, the blank column on each page for visitors' notes, the use of which every appreciative critic will acknowledge.

HINTS ON HOUSE-DECORATION

UNDER this title Mr. William Morris, M.A., delivered, on Saturday evening, the first of a series of lectures to be given in the Society of Arts' large hall, under the auspices of the Trades Guild of Learning. There was an overflowing attendance. Professor Hales, of King's College, occupied the chair, and introduced Mr. Morris as one of the chief poets of the day, as a lover and protector of old buildings both from hasty restoration and from the intrusion of inappropriate monuments, as a humanitarian, and as a lecturer.

Mr. Morris said he was there that evening to talk about some ideas which experience in his craft had led him to formulate into a set of rules for guidance in practice. When such impulses were being formed in a number of minds at the same time, they led to the devising of rules, and these to the origination of schools. Thus was increased the amount of skill displayed in the distinctive work on which those minds were employed, for the more intense the impulses the more vigorous would be the life displayed in the craft. Such rules might seem arbitrary, but they had their roots deep down in the needs of the human mind. He was not there as the representative of any particular school, yet he felt conscious of impulses he could not help, and it would be mere assumption to suppose he stood alone in the world. Nor could he claim to represent any particular craft; he had been compelled to learn many, and, according to the old proverb, was therefore forbidden to master any. This experience had made him very discontented. He should hold his peace on all art subjects if he did not hope that this discontent would produce good results, since he was a rebel not against laws, but against mere follies of custom. He proposed to consider how, by thought and forethought, we could make the houses in which our stupidity and necessity compelled us to live, better and more pleasant. He should be forced to confine his subject to the middle-class house, in which he himself lived, and to employ as a unit a room rather than a house. These houses might be roughly divided into three classes. A few remained of the houses built by our forefathers, when beauty of appearance, good style, nobility of character, and solidity of workmanship, was apparent throughout. Of these Holland House was almost the only example left to us in the metropolis; there were till within the last few years a group of others in Lime-street, in the City, but these belonged to a very poor landlord, the Fishmongers' Company, who could not appreciate them. He would suggest nothing for improving such houses as these, except to preserve unaltered for the benefit of future generations. There were other houses which, less ignoble and more solid than the majority of our dwellings, had little or no beauty, and dated from the early Georges; to these the name "Queen Anne" was often given, but it ante-dated these houses. They were difficult enough to decorate, because they had still some style, a mode which it was impossible not to recognise, but which no one now living could fully sympathise with. The rebellion which they had met that night to further had already begun. Here and there in London were experimental houses born of the same thought and principle, and great powers of design, which made the "Queen Anne" what they were; these experiments were gifts to the nation which would always be respected. Incidentally he might remark that the London School-Board had shown in their buildings that education and art might go hand-in-hand, and he thought London was to be congratulated on the results of their endeavour. When the old houses of good style, the square and solid Georgian ones and the few designed by the ringleaders of the new rebellion had been enumerated, there remained the great mass of dwellings in which there was not alone no regard for beauty, but no care for convenience. True, these sordid houses —these mere congeries of rooms—were no longer considered integral parts of people's lives, but that was what he wanted to shame men out of. The first endeavour must be to get people to make the best of these makeshift habitations, so as to increase their comfort, enjoyment, and self-respect, and to induce in their minds a longing for art for its own sake. In his attempt to teach, he should be compelled to give much negative advice and endeavour to instruct by nearly always saying, Don't. He proposed to begin with the consideration of what was called, by town dwellers, a garden, possessed by all who lived in the suburbs except the very genteel and the very poor. Suburban gardeners generally made the worst and not the best of the little strips the builders were obliged by by-laws to leave them. They cut them up into as many and as winding paths as possible, and then filled them with masses of colour on a formal plan. He should say: Fence the garden in as much as possible, lay it out in an orderly way, and stock it with the best of flowers, that will grow amidst town smoke. Be very shy of all double flowers, sophisticated and distorted by the florist's art; avoid ferns and such plants, which give a dreary appearance, and refuse all cactuses and like monstrosities imported from hot countries where man is an intruder. The colours should be harmonised and well mingled, not separated into distinct beds; two of the most unsightly plants were scarlet geraniums and yellow calceolarias, and these the town gardener frequently mixed together. Above all, the garden should be treated as a part of the dwelling. The outside of a London house was, he feared, too ugly to detain them long. Let what painting had to be done be as simple as possible, and let it be white or whitish in colour. Don't pick out the unsightly details with hot colours; let them be as unobtrusive as possible. The sash-windows ought, whatever the colour of the walls, to be kept white. Chocolate and similar brown reds should on every account be avoided as wall-colours. Now he would, in imagination, enter the house, and, as the walls of rooms were the most important part to be decorated, he would reserve their consideration to the last. As to the arrangement of windows, he must again grumble. In most decent houses the windows were much too large, and let in a flood of light which had to be shut out again by Venetian shutters, blinds, curtains, and other means. They were almost always brought too low down, and too often were big rectangular holes in the walls, apparently divided only by a sash-bar. He should make their purpose clear by filling them with moderate-sized panes of glass. Looking next upon the floors, doctors were beginning to tell them that the custom of covering the whole surface with an immovable woollen covering, was as nasty and unwholesome as it looked. The fashion was changing for the better, and carpets were being replaced by rugs. He would go further, and say that even rugs were unnecessary in summer. As this new custom spread, it would have several good effects; our floors would have to be made of better materials, and in a more sound manner than had been the case, and there being less covering material required, people would be able to provide superior quality in their substitutes for carpets. He confessed that the treatment of a London ceiling was a sore point with him. The simplest and most natural mode was to show the joists of floor above, or the rafters of roof, and these might be relieved by colour. Where the quality or construction would not permit this, an alternative was to cover the wood with plaster, and work this in the rough into patterns. But no art had fallen so low as that of the plasterer, and our ceilings, with their smooth surfaces and cast "ornament" in the centres and at cornices, were never supposed to be looked at by any well-educated person. The very material was wrong—too smooth and too shiny. It was often proposed to paper our ceilings, but he could not agree with that. People would not, and ought not to, be shut up in a papered box. There remained nothing for it but to paint the surface cautiously, or to leave it plain and forget it. Of course, the suggestion to use painted decoration implied that his hearers would never use gas in their rooms. Now, having disposed of the upper and lower surfaces of room, he would deal with its sides. If a room were small the walls had better not be divided at all; if of good size, the worst that could happen to it would be to be divided into exactly equal parts. Where the room was tall, panelling would be fittest, and in this case the frieze should be made a prominent feature. In a room of moderate height, a dado, about 4ft. 6in., above the floor, might be used, and the upper portion papered. Not more than one pattern should be used in the same room. Pattern upon pattern in paper-hanging had always an unsatisfactory effect. A recurring pattern should be employed very sparingly. In dealing with a very lofty apartment it was best to put nothing that attracted the eye more than about 8ft. above the floor, but to leave everything above that line as air and space. He must next deal with the woodwork in a room. No wood should, strictly speaking, be introduced that required flat painting; but unless a noble material were used this could not be avoided. Deal was such a poor substance that it must be hidden, in a roof or ceiling by distemper, on walls by paint. If they were able to use oak, let them leave it as it came from the plane, and found the decoration of the room upon its tone. This led him to speak of the tints available for wall decoration. Although it was a sign of disease in an artist to have a violent objection to a particular colour, yet many could only be used in very limited quantities. Yellow, for example, could not be introduced in masses; even when broken up, the colour could only be employed in some materials affording a play of light and shade. Primrose and other tints were only fit for use on silks. Reds also were difficult to manage unless the tones were helped by beauty of material. Hot brown reds were very ungrateful to the eye, and the tint now known as magenta could only be introduced to a very small extent in combination. Scarlet and russet were dyers' or woollen colours. Pink should in decoration tend rather towards orange. Purple, if introduced at all, should not be bright, and should tend towards russet. Green was not so much used by Nature as was generally supposed. The very light tones were only seen for a very short time at the burst of spring, and owed their charm to their tender and transient character. While he would caution his hearers against trying to outdo nature by using too bright a tone, he would equally warn them against the exclusive use of those cold, dull tones which, he was told, he was supposed to have largely brought into vogue. While green was the workaday colour, blue was the holiday colour, and in these the pure pale tints were the most useful. In decoration, it should be recollected that if you used bold and deep colours, they would tempt you into using deeper and yet deeper colours to harmonise with these, and for this reason he recommended the use of but little yellow, but more freely of deep reds, pale golden pinks, quiet shades of green, and pale blues. Soberness of tone was necessary to gain the moderation required in decorating. A yet worse fault than the use of too vivid colours was to allow all the tints to get dingy and muddy. If his colouring was not pure and clear, a decorator had not learned his business. Next as to the design of pattern which would form the decoration. The first step from a plain tint was to place dark upon light, or light upon dark, of which the first was the best and easiest. Red was the colour in which the tones must be nearest to each other; green held a middle place, and in blue they could be most widely separated. If the colours were deep in tone it would try all the decorator's skill, and he would be almost compelled to advance another stage, and add a third colour. Skill would be displayed in obtaining relief of forms, harmonious arrangement, and softness of tones. Superposed colours need not all be upon the same apparent plane, and this gradually led to the separation of colour from colour by a distinct line of yet another colour, which completed the harmony. This method of treatment was almost an art in itself. It was, indeed, the most difficult of all, and might be termed the Oriental mode of working. In Persian work they had at its best this use of colours which interpenetrated. The employment of colour for colour's sake was not natural to us, and would never take a genuine hold upon our civilised minds. He warned decorators against the abuse of dotting and specking their backgrounds, an error which vulgarised a pattern irremediably. He must pass on to consider the moral qualities of decoration—order and meaning. Without the first, decoration could not exist; without the second, it had better not be introduced. The principle of order was one which could not be ignored even to the limited extent permitted to the painters of pictures; but it afforded no excuse for want of observation or diligence in designing. Conventionalism was compulsory upon the decorator, but the convention must be his own, made so by a thorough understanding of the material worked upon and the subject you are using. The more obvious the geometrical character of the pattern, the less might the treatment tend towards naturalism. All materials offered certain difficulties to be overcome, and presented certain advantages; the endeavour would be to master the material so far as to express the aims and subserve beauty, but the decorator must not go beyond that point, or he will not produce a work of art but a mere toy. This had been the history of mosaic, in which the mode of building up a design had been ignored, and the fatal mistake made of attempting to produce a picture and not a pattern. A work of decoration must, except the work is on a small scale, be constructed on a geometrical basis. The pattern should grow strongly, every part or stem should be traceable to its source, but the geometrical character of the design should not be too apparent at first. If the plan of the design was at once clear, and the eye glanced readily from line to line, a restless effect was produced. It was a mistake to use a very small pattern. However beautiful arabesques might be, their use was absurd in the hands of an alien race. The designer must cover the ground equally and richly, and no amount of care in first getting the leading lines of a pattern satisfactory was wasted. Like a fortress, a pattern was no stronger than its weakest part. The second quality of decoration, meaning, was the soul of the art; the imagination of the artist conferred on his work qualities which were absent from the mere form. Beauty must not be sacrificed to oddity or caprice, but no pattern should at heart be without some purpose. Imitation would not suffice; the designer must find something for himself, even in a carpet or a paper. There must be, besides thought, a hope of change in the design. The originator must further be able to make someone else understand him, remembering that the distinction between the genius and the madman, was that the former could get, at least, a few people to comprehend him, while the latter could not. Returning to the every-day makeshift house, he recollected that he had not as yet said anything about the fireplace, than which nothing was more distinctly difficult to treat than this. If they did not know how to decorate the hearth, the defence of which was now a mere figure of speech, he would suggest that they should have some sort of hole in the wall, a basket for the fire, and as little fender or guard as they thought was safe. Don't, he would add, mix up wood and tile; let the latter be part of the fireplace, and the former part of the wall. A dining-room ought not to look like a dentist's parlour, nor a drawing-room like a room in which no work can be done but that of boring one another. The drawing-room should of course be tidy, very tidy; but it could be made too tidy, and too often, especially in the houses of the rich, was it made a place of luxury and grandeur without comfort. In such a place Art was sick and could not recover except in more simple places. It was not true that the rich man could have art and the poor man could not. The thing implied in the term "cheap art" had no existence. Unlike law and religion, there was not in art one law for the rich and another for the poor. What was meant by people who talk of art for the million was that some educated Pecksniff should squint at a scrap of paper, and they further conceived that the result of the squint should be a design which would employ a multitude of well-fed operatives working for twelve, or perhaps, in their benevolence, ten hours a day, in turning out copies after a manner which should bring in moderate wages for the operative machines, comparative riches for the gifted squinter, and enormous wealth for the benevolent capitalist, who organised the movement. "Cheap art" was one of the schemes for keeping one's cake after eating it, for skinning a flint for its oil, for boiling a flea for his tallow. Truly cheap art would be aided by men ever striving to do better, and refusing to turn out bad work or even that which was indifferent. Such a man he should call a workman; but to the money-coining capitalist he would be a troublesome fellow—a mere grit in the machinery. In conclusion he said, If we want real art we must be prepared to pay the due price for it. That due price is money enough to the worker to keep him from degradation, leisure enough to allow him time to read and to think, work enough of a kind to keep him employed, and lastly as much art in his home as nature will allow if we do not turn her out of doors. If the price be offered, and the world want such a man, the man will be found; if not, art must be damped to death. When life in art like the sun begins to rise from below, all trouble and vexation will be forgotten, all folly and vexation will be forgiven. When the dawn of art comes, as it will come, let it find that we have been working for and looking forward to it while yet we were slaves. It is, now both our right and our duty to rebel against everyday life. We have art enough in our lives not to content us, but to make us long for more. Little by little, art will go on increasing until at last every man will enjoy a share of it. As with all experiments of reform, at first few men heed it; then most men condemn it; lastly all men accept it, and the cause is won.

The **Chairman**, in proposing a vote of thanks to Mr. Morris for his wise and eloquent lecture, remarked that he had shown how the pursuit and possession of riches were opposed to true art, how we each could make our lives artistic by bringing beauty into our everyday existence, to brighten it with colour and fill it with the perception of graceful form; none the less were these thanks due to Mr. Morris because, unlike another great prophet, he had not despaired of our future.

A coffee hotel is being built at Taunton from Mr. Samson's designs.

GRAMMAR OF JAPANESE ORNAMENT.*

We have received part IV. of the "Grammar of Japanese Ornament and Design." by Mr. Thomas W. Cutler, F.R.I.B.A., which appears to complete the work. It will be unnecessary to add to our former testimony of the value of Mr. Cutler's performance, which Mr. B. T. Batsford, the publisher, has so well brought out. The Grammar is a selection of characteristic examples of Japanese ornament, intended for the use of the decorative artist, and Mr. Cutler has brought together fifty-eight plates, besides various woodcut illustrations, chiefly copies from original works. The plates are photo-lithographs by C. F. Kell, and appear to preserve the spirit of the originals. In the present part the letterpress is furnished, containing a preface, index of plates, an introduction, in which the subjects of architecture, sculpture, painting, lacquer, ceramics, textile fabrics, metal-work, enamel, and decorative art are described; also an analysis of Japanese ornament. The plates given with the present part contain diagrams illustrating the various combinations of straight lines, curves, and natural forms which form the elements of Japanese design, besides plates showing the studies of trees and plants, insects, birds, and fishes. These are characteristic and suggestive, rather than complete, examples of ornament, and admirably serve to show the *motif* of the artist, and how he treated natural forms and rendered them decorative. The plates given to illustrate the analysis are particularly useful in this way, and the author, in his remarks, makes a few observations that are worth remembering. We are all struck with the charming irregularity, and almost studied want of symmetry in Japanese ornament, and Mr. Cutler well remarks that one of the principles which underlie the decorative art of Japan is the avoidance of the appearance of symmetry, while producing symmetrical effects, a suggestion of variation. "A Japanese artist proceeding to decorate a given space," says Mr. Cutler, "would not mark out the centre and place his ornament there, nor would he divide it into equal parts; but he would, most probably, throw his design a little out of the centre, and cleverly balance the composition by a butterfly, a leaf, or even a spot of colour." Another instructive peculiarity about Japanese ornament is the rare occurrence of the human figure, and the preponderance given to vegetable and animal life, as flowers, trees, birds, and fishes, upon which the utmost power of the pencil is lavished. We have before mentioned the striking resemblance of many of the simpler geometrical forms and frets used to Greek, Hindoo, Persian, and other Oriental styles, and the author points some of these out. The fret is a particularly common border, and many of the diapers are exceedingly beautiful and varied. The diapered surface, overlaid with medallions and other forms, is another common mode of decorating surfaces, and several examples of this are given. Another plate illustrates curvilinear forms done by the brush, scrolls, and various sorts of flourishes seen on lacquer and china. The ends of timbers in buildings are often adorned by scroll-work. Studies of the bamboo, in which the various stages of its growth are shown; flowers and their component parts, birds and their plumage, and water, are illustrated to accompany this part of the Grammar, many copied from native drawing-books. The grouping and varied positions given to the crane, the hawk, falcon, peacock, and other birds, are particularly noticeable in decorative work, associated with a spray of bamboo, and other favourite kinds of foliage. What a wealth of invention is there in the chrysanthemum or "kiku," as treated by the Japanese artist; with how few lines of his brush can he portray it in every conceivable aspect; so also of the peony, cherry, and the plum. In the native books, the leaves and blossoms are delineated with the greatest nicety, and in various stages of growth, and we find one of the plates gives a reproduction from one of these.

The Japanese artist is a great conventionaliser, though, as the author hints, he does not proceed on any recognised principle of the treatment of different materials, as marvellous reproductions of birds and insects and flowers are found on the most opposite materials. Yet he is, *par excellence*, a decorative artist first; look at the designs from wall-papers and silk brocades in plate 58 as an example of this; also at the beautiful plate showing fish and water, from an old embroidery, plate 18; the heraldic badges on plate 54; and the groups of iris in water, from a lacquered tray, plate 35, where sky, water, and plant are introduced in such a manner as to produce decorative effect, notwithstanding the natural imitation of the objects. Probably, if perspective was understood, this power of producing decorative effects would decline. If there is any ground for such a surmise, the value of old Japanese work such as that illustrated in the book before us would be enhanced. For outline and colour nothing can be more pleasing than the group of cranes, from old embroidery, on plate 12, but we have no space further to analyse. One of the earlier chapters deals with architecture, but examples are not given—an omission unavoidable, perhaps, but one the author might fill up another day. Decorative woodwork, whether pierced or carved, or simply painted and gilt, is almost a unique art amongst the Japanese. A handsomely-designed title-page is given with the present part; the work is dedicated to the Princess Louise, Marchioness of Lorne, and those engaged in art-work will do well to become possessors of a volume which will impart to them the elements of Japanese design, and probably help to infuse into their work some freshness and character.

IMPROVED STREET-LIGHTING IN BIRMINGHAM.

For some time past the Gas Committee of the Corporation of Birmingham have been experimenting at their Windsor-street Works with all the improved lamps which have been tried at London and Paris, with the view of competing with the electric light for illuminating large spaces. The aim has been to ascertain two points—the most effective burner relatively to the quantity of gas consumed, and the form of lantern which best diffuses the light afforded. On the former point the committee have decided in favour of a triple cluster of Bray's flat-flame burners, and upon the latter the experiments have conclusively demonstrated the superiority of a globular form of lantern over any of the angular patterns. In the vicinity of the Council-house and Town-hall a number of these lamps have been erected, single posts being distributed at intervals of 50 or 60ft., while standards bearing three globes each are placed along the frontages of the Council-house, and a standard with a group of five globes on the refuge by the Town-hall; each globe is 27in. in diameter, and the ribs are as thin as possible, so as not to obstruct the light; the inside of the upper part is lined with opal plates, the reflection from which will dissipate to some extent the shadow of the post, and each globe has a special construction of chimney to carry off the heat and prevent down-draught. The lanterns are fitted with a special form of tap designed by Mr. Hunt, the engineer at the Windsor-street Works, by whom the trials have been principally conducted.

Upon each tap four burners are fixed, but only three are intended to be alight when the greatest illumination is needed. The centre one is to serve two purposes—in the first it will afford "a flash light," or small jet to burn all day, and from which the other burners are lighted, and in the second place it will burn at full height by itself during the later hours of the night when the others are turned out. Each burner consuming 10ft. of gas per hour, has a flame measuring 4in. in height and 3½in. in width, and having illuminating power equal to 30 sperm candles. The three jets in each lantern, though close together, burn separately without blending, and, therefore, the total illuminating power of each globe will be equal to 90 candles, as the result of burning 30ft. of gas per hour. It will thus be easily imagined that a group of five such lamps will afford an intense blaze of light. The standards have been specially designed, and are by Messrs. Hart, Son, Peard, and Co., of London and Birmingham. The success of this new system is declared to be perfect.

The granite work of the Temple Bar Memorial was supplied by Messrs. Alex. Macdonald, Field, and Co.

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* A Grammar of Japanese Ornament and Design. By Thomas W. Cutler, F.R.I.B.A. London: B. T. Batsford, High Holborn.

ROYAL INSTITUTE OF BRITISH ARCHITECTS.

THE first ordinary meeting of the Institute for the present session was held on Monday evening, Professor T. Hayter Lewis, Vice-President, in the chair. The Secretary announced the death, on the 30th ult., of Mr. Edward M. Forster, of Great Marlborough-street, W., Associate.

THE MODERN BARRACK: ITS PLANS AND CONSTRUCTION.

Mr. E. Ingress Bell read a paper on this subject. He commenced by a reference to the power conferred by the "Military Forces Localisation Act" of 1872 for building barracks and otherwise effecting the localisation of the Home Forces. It was desired to maintain the permanent identification of particular regiments with particular localities. Since the passing of the Act old barracks had been enlarged or new ones built at fifty-four different stations in the United Kingdom, accommodating a total force of 12,000 men and costing no less than 2½ millions sterling, exclusive of the land upon which they stand. He then dealt with the great barrack-building movement, which marked the close of the last century—using the defects of the system then inaugurated as a scale by which to test the improvements exhibited by the barracks of the present day. He dwelt upon the unvarying ugliness of the typical barrack of the last century, and traced the causes of its defective plan to the circumstances under which it was built. After the establishment of the army on a legal footing, at the Restoration, no barracks were built with the exception of those at Whitehall for the Horse and Foot Guards, and a few in Scotland. The reason was the antipathy of the nation to a standing army, and the consequent repugnance of the Parliament to vote the required funds. Meanwhile the army increased in numbers, and suffered in health from exposure and privation. The mortality amongst the troops was so alarming that various expedients were adopted; but still barracks were refused. Even so late as 1766, Blackstone wrote:—"Nothing should be more guarded against in a free State than making the military form a body distinct from the people. The soldiers should be intermixed with the people. No barracks should be allowed." The crowning objection to their erection was the use to which they had been put in Ireland. At length it became essential that some recognised plan for housing the troops should be adopted, and in the latter part of the century Mr. Pitt proposed a measure for building the necessary barracks. An enormous number of barracks was commenced simultaneously all over the country; they were based on one defective and hastily-considered model, and to that period (1793-97) we owed the dreary pile whose very name had become a synonym for ugliness and which was seen in most of our more important towns. The first step to systematise the construction of barracks on a better plan was taken at the close of the Crimean war. Committees and Royal Commissions under the auspices of Lords Panmure and Herbert inquired into and reported upon the condition of every barrack in the United Kingdom; and long and sad was the list of their shortcomings. The architectural profession was invited to compete for the erection of an infantry and a cavalry barrack. Those at Chelsea and at Knightsbridge were the indirect result; but in both cases the competition plans were set aside, and the actual plans of the buildings, though not the elevations, were designed by the authorities at the War Office. The defects of the old system were due to complicated planning; over-crowding on the ground; buildings interfering with the ventilation of one another, containing too many rooms and too great a number of stories, built round enclosed courts or too near boundary walls; and to defective sanitation in all its branches. It was found that the excessive mortality amongst the troops—no less than twice that of the civil population—was traceable to specific diseases directly induced by the unhealthiness of barrack rooms, by want of ventilation, by defective water-supply and sewerage. The result was the promulgation of a series of recommendations—(1) prescribing the superficial and cubical space to be allotted to each man; (2) abolishing the old offensive urine tubs from the barrack rooms; (3) providing separate quarters for married men, baths, washing establishments, workshops, reading and recreation rooms, skittle alleys, &c.; (4) regulating the warming, ventilation, water-supply, and drainage. The regulations which followed were directed to an improvement of the general system of barrack plan, and to the proper remedy for each particular defect in construction, warming, ventilating, &c. Consequently, at the present day, there is no one of Her Majesty's subjects who is more scientifically provided for in all that conduces to health and physical well-being than the common soldier. The type of barrack which was accepted in the eighteenth century was exhibited in the plans of a vast unexecuted project for Hyde Park, and the want of provision for the decencies and necessities of barrack life was shown therein. The difficulties of acquiring, at reasonable rates, sites for Government buildings having been touched upon, Mr. Bell adverted to the conditions necessary to be observed in the disposition of the barracks as a whole, namely:—The want of a clear space around the barrack wall; of an ample parade ground; the proper placing of the officers' quarters; the keep and store accommodation; guard house; hospital; canteens, and the other items in a barrack establishment. The separate accommodation of each and their proper mutual relation were discussed and described in particular. The means of lighting and proportion of window space; the arrangements for warming and ventilating; the admission of fresh air and the extraction of foul air; the proportions of inlets and exits; and the special provisions and precautions rendered necessary by the habits of the soldier were described. It was necessary that the soldier's rooms should be provided with indestructible fittings. With him, valves were simply things to be fastened down, and ventilation openings only things to be stopped up. Long experience of his idiosyncrasies and of the exigencies of barrack occupation went to prove that of all the methods of warming barrack rooms that of the open fireplace was the best, and the best open fireplace was one perfected upon suggestions furnished by earlier models by Captain Galton. Under the old system, fresh-air inlets were undreamt of, and the rooms were warmed at the expense of the purity of the air within them; under the new system, the contrary, in some instances, had proved the case; and the rooms had been over-ventilated. It was easy to warm a room, equally easy to ventilate it, but not easy to both warm and ventilate it at the same time. The problem was no other than that of applying a constant system to various atmospheric conditions, and all that could be looked for was a reasonable compromise, which experiment alone would dictate. Mr. Bell stated that a site for an ordinary barrack must comprise ten acres, exclusive of a training-ground and an encamping-ground for the militia. Instances were given of departure from the typical plan, caused by special conditions of site, &c., and the scope left for ingenuity of planning in individual cases, notwithstanding the necessity for conforming to settled rules and principles. Each barrack-room was designed to hold one-eighth part of the rank and file composing a brigade depôt, viz., 28 men. 720ft. of cubical space were allotted to each man. The married men had each a living-room, a bed-room, and a kitchen. The non-commissioned officers' quarters constituted a little club, furnished with comforts, aids to study and means of wholesome recreation, for the like of which the city clerk scarcely knew where to look. The officers' quarters called for no special remark. The average cost per head of a barrack in the latter part of the last century was £12; the cost of the new Chelsea barracks was about £225 per head, and of the brigade depôts £200 per head. The average cost per cube foot was, for barrack buildings, 5½d.; for married people's quarters, 6½d.; and for officers' quarters, about 8d. The improvements effected by somewhat similar means in the arrangement of stable buildings; the system of ventilation; of drainage; and other matters relating thereto were explained. Cavalry stables were now arranged in two rows of stalls, the heads of the horses in each case being against an outer side wall. Every horse was allowed 1,200 cubical feet of space. A window was placed over every stall and 8ft. above the floor, and all the stable windows were made to open. When rooms were built over stables, foul air shafts were carried up to above the roofs. These shafts had a sectional area of 18in. per horse. The stalls were drained by surface channels only; these were carried to a distance of 12ft. outside the stable. The loose boxes were 17ft. by 12ft. and 12ft. high, allowing 2,500 cubical feet per horse. The parallel movement towards ameliorating the barracks of France, in which the English lead has been followed, and with due acknowledgments, was then described—elucidated by the reports of M. Emile Trélat, and some useful and interesting extracts from the report were given in substance. The "Système Tollet," tried experimentally at Bourges, Macon, Autun, and elsewhere—based mainly upon English experience and found to be quite successful—was referred to and its main features were elucidated. In conclusion, an appeal as to the improved character of the exterior appearance of the modern barrack was made to new buildings at Inverness, Reading, and elsewhere. Some deductions from Government experience and investigation bearing upon the larger civil buildings, such as workhouses, model dwellings, &c., were submitted to the members. The whole subject was fully illustrated by drawings of old barracks and of barracks built or building by the War Department, drawings which were placed at the service of the author—together with other facilities—by the courtesy of the Secretary of State for War.

Mr. C. Barry, in proposing a vote of thanks to Mr. Bell for his paper, remarked that much of the information would be of use to the profession in the designing of workhouses and similar large buildings. It was to be regretted that the only times when the War Office seemed to have sought the assistance of architects, in the competition for the Chelsea and Knightsbridge barracks, the results were so unsatisfactory, owing to the attempt to plaster the accepted designs on to plans prepared by officials. He thought the cost per cubic foot of barracks was remarkably low, as compared with that of artisans' dwellings. He was told that all contracts were submitted to competition, and presumed that the ordinary number of builders were ruined in the process. At the same time, the cost per head, £200, and £225, would be regarded as high, even in public schools.

Dr. Balfour, Inspector-General of Army Medical Corps, referred to the fact that he was secretary to a Parliamentary Commission on barracks many years since, and dwelt upon the great contrast in the sanitary condition of our barracks which had been effected of recent years. The date of the commencement of reforms might be carried back to the middle of the present century. When he was in the Horse Guards, many years ago, the barracks at Winchester and Chichester were well ventilated, and much better than the old type of buildings. There were, however, some very bad cases. Thus, in Hyde-park, he was quartered in a building still existing of three stories, of which the lower rooms were occupied by a store-keeper and a sentinel, and above these all the soldiers had to sleep. Paillasses were placed next each other, down each side of the room, and another row were placed in the centre. It was not to be wondered at that the mortality and sickness were very great. Representations were made by which the two lower rooms were also converted into dormitories, and even now the accommodation was too small. He agreed with the encomiums on the Galton stove, but care should be taken to see that it was complete. Recently, when he was at Netley Hospital, he found that in the corridors both the air-chamber and the louvre were omitted to save space, and although he made a very strong representation to head-quarters, he did not know if these defects were remedied. Great vigilance was necessary to prevent soldiers from stopping up all ventilation; they greatly feared a draught, and never thought a sleeping-room too close. The only effectual protection to the health of the soldier he had found was to put all the ventilating apparatus under the charge of a non-commissioned officer. Our stables now compared favourably in ventilation and arrangement with those of other nations. Our mortality in horses was at the rate of 2 per cent. per annum, while even in France the rate was between 3 and 4 per cent. The best protection against glanders was to have plenty of fresh air in the stable, and to give warmth by clothing. In his recent visits to French military stables, he was surprised to note the excessively bad construction; the best arrangements were in the stables of the gendarmerie in Paris.

Mr. T. Porter said, when he was in the War

Office department at Portsmouth, the system of ignoring the architectural profession prevailed just as the lecturer had shown was the case at Whitehall: a Royal Engineer got out the regulation drawings, and it was left to the practical clerk of works to do the rest. Unlike Mr. Barry, he thought the cost of barracks very high. £225 per head appeared enormous, and even 5½d. per cubic foot was by no means moderate for enormous buildings so plain in character and so little divided as barracks were. He was sorry Mr. Bell had not given more details as to the mode of ventilation adopted in the barrack-room.

Mr. E. C. **Robins** also asked for particulars as to the ventilation of rooms, and whether any other stoves than Galton's were used. He had not always found them effective, although they usually were. He thought that the designing of such large national buildings ought to be entrusted to architects.

Mr. **Wm. White** said the cost of the old barracks, £12 per head, was incomprehensibly low, even allowing for the lower price of labour and materials two generations since.

Mr. **Dawson** said the cost per cubic capacity and per head could not be reconciled. On the measurements given he did not see how, at 6d. per foot, the barrack could cost more than one-tenth or even one-twentieth part of the sum stated by Mr. Bell.

The **Chairman** said he knew that in the case of the Chelsea barracks the cost was enormously increased by the nature of the site. Part of the barracks stood on porous gravel, but another part more on what seemed to be the old bed of the river, and it was found that piles disappeared after being driven down 60ft. Ultimately an immense bed of concrete was prepared to cover the whole site, and on this platform part of the barracks stood.

Mr. Bell acknowledged the vote of thanks which had been heartily accorded, and replied to the various points in the discussion. The cost per head, he admitted, seemed very large, but this was owing to the numerous and expensive accessories — gymnasia, bath-rooms, canteens, &c. The old barracks were nothing but large rooms, and were scarcely provided with the barest necessities. The stoves of Captain Galston were universally used and worked well. He had been careful to guard himself against the assumption that all the improvement in the health of our troops was due to construction; and, indeed, there were several other causes tending to the same desirable result, and his aim had been to show the great alteration for the better that had been effected during the past few years.

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MR. H. H. STATHAM ON ARCHITECTURE.

On Tuesday night, before the Edinburgh Philosophical Institution, Mr. Henry Heathcote Statham, of London, delivered the first of two Lectures on "Architecture in Design and Ornament." Setting out with a definition of architecture, in the course of which he remarked that it differed from other kinds of artistic expression in not copying the forms of nature, and in being governed by practical requirements, and being amenable to practical laws, the lecturer mentioned certain principles to which the art must conform in order to be true and logical, and proceeded to illustrate these in a discussion of the Doric and Gothic styles. These styles, he said, represented the most complete expression of the two most important forms of construction — that which bridged an opening with a lintel, and that which bridged an opening with an arch. The design of the Doric temple was briefly explained, and it was shown how, in course of development, its various features had grown out of structural requirements, and how, as a matter of expression, the fluting of the columns emphasised the fact of their carrying a downward-bearing weight. The Roman period was next referred to as that in which, through centuries of transition, Greek architecture was gradually fused into Gothic architecture. The Romans, it was pointed out, were the first to introduce the arch on a great scale for the purpose of bridging over wide spaces. In doing so, however, the lecturer remarked they showed themselves bad artists, never attempting to find a correct architectural expression for it. They admired the Greek architecture and adopted it, but in a way which indicated a perfect misconception of it. For instance, they would construct buildings with columns spaced at such a distance that no stones could carry from one to the other; but they would imitate, all the same, the Greek architrave and cornice, and put an arch underneath to carry them. Then, when they wanted columns to support an arch, they could not be content to spring the arch from the capital of the column; they had always been accustomed to think of a column as it was in the Greek architecture—something with an architrave, frieze, and cornice; and therefore they placed over the capital a slice of the architrave, a slice of the frieze, and a slice of the cornice, without any reason whatever. The lecturer went on to show how, in the development of vaulting, cross-arches were adopted as a means of distributing the thrust; how, in the adjustment of these to the main vault, there arose a difficulty which was ultimately solved by the introduction of pointed arches, which could be kept to the same height from different widths, with curves so nearly the same as to work well together. In tracing the further progress of vaulting, it was shown that, while the Romans did not mark the lines of intersection of the arches, the Gothic architects, with truer instinct, marked those lines with grooved ribs, which had the same artistic value as the fluting of the Greek column in emphasising the structural character. Fnding this had a pleasing effect, they began to carry it further, by introducing intermediate ribs; and with this there came a curious change in the construction, for, instead of the vaulting consisting of intersecting arches, it came to be really a structure of ribs with surfaces filled in between. The introduction of bosses was traced to the desirableness of concealing the awkward meeting of the ribs at the top; while the further difficulty of getting a number of mouldings to join each other at different angles over the capital was referred to as the origin of that beautiful fan-vaulting, which is to be seen in Henry Seventh's Chapel, Westminster Abbey, and in King's College Chapel, Cambridge. The lecturer proceeded to describe the development of the Gothic buttress from the Roman pilaster, as a means of resisting outward thrust; and to indicate the gradual progress from the simplest mouldings to that elaborate system in which every moulding of arch has its appropriate shaft in the pier supporting it. In illustration of the principle that the grouping of a building must arise out of its plan, it was contended that an edifice with two wings, differing internally, but showing the same external features, was an architectural falsity. And yet, the lecturer said, this falsity was committed over and over again, wherever an architect treated the outside of a building without reference to the interior, instead of making the outside express the nature and internal grouping of the structure. In this connection, the plan of the Houses of Parliament was commended, inasmuch as the central point of the interior was indicated by an appropriate external feature, and the Royal entrance by the great west tower, while the east tower was properly designed for its special purpose of carrying a clock. Touching next on scale in architecture, Mr. Statham said St. Peter's did not look so big as it really was; and the fact that it did not was one of the greatest faults that a great building could have. Michael Angelo, instead of breaking up the front into stages, as San Gallo originally proposed, introduced great pilasters 100ft. high, with an enormous attic above, and, as the eye was not accustomed to take in features of that enormous size, the consequence was that the whole building was dwarfed, and one did not realise how large it was. After some remarks on logical treatment in architecture, in the course of which he characterised the upper part of the wall of St. Paul's as nothing but a sham, intended to conceal the real construction, Mr. Statham, in concluding, said the buildings of the two great periods he had referred to were what people invented because they wanted them. Now, however, we had come to the repetition age. Edinburgh had, on the Calton Hill, its effort to be Greek; just as if the Greeks had built on the Acropolis an Egyptian temple, which we should have called an absurd sham. If an architect, unfettered by precedent, were told to build a large church in the best form for modern worship, he would not evolve the Mediæval type of cathedral. We raised such structures out of sentiment. Looking back upon the past course of architecture, we should see that all we now admired was built by people who built it with practical ends in view, not excluding art; and it was not likely we should get architecture which future generations would admire, or which would express the wants of our generation, until we did the same. In order to that end, an intelligent public opinion was one of the most important factors. It was to this we must look, in great measure, for helping the progress of logic and common-sense in the architecture of the period. The lecture was illustrated with numerous drawings.

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INSTITUTION OF SURVEYORS.

The opening address for the new session of the Institution of Surveyors was delivered on Monday week by Mr. Edward Ryde, President. In it he dwelt upon the desirability of the purchase, for the public, of the works of companies now supplying London with water, and defended the bargain which their Past-President, the late Mr. Edmund James Smith, made for Mr. Cross. He declared that, in his judgment, "no better terms, or even so good, for the purchaser will ever be made as those which were arranged by Mr. Smith. The basis of those terms was the payment in paper, by a 3½ per cent. stock, of the sum of £31,300,000, spread over a period of 12 years. If the nominal amount of that payment had been just half the amount of 7 per cent. stock, the purchase would have probably appeared to the public a very moderate one, while the security and value of the stock to the holders would have been precisely the same. The interest would have been met by the water rental, and, in the event of any insufficiency, the deficit was to be made up by the rates of London. No easier terms could ever have resulted from arbitration, and therefore it may be ultimately found that, in throwing over the agreements and Mr. E. J. Smith, the interests of the ratepayers may not have been promoted — although those of the Institution of Surveyors will be." The President dealt at great length with the present agricultural depression and with the Irish land question, as to which he held that the first inquiry to be made should be whether it would be equitable to assume that the tenant had some material interest in the land he occupied; and if he had, the proper remedy would enable the landlord to compensate the tenant for termination of tenure, and not that the tenant should be able to compel the landlord to sell his lease. He advocated some changes in the mode of making parochial valuations, and spoke with qualified approval of the Government Bill defeated last session by want of time, which will probably be reintroduced. The Ordnance Survey maps, now being published, would do much to facilitate valuations, but were inaccurate in several particulars. Thus, in every case of the division of property by means of a bank and ditch, the bank and ditch must, of necessity, belong to the land which was on the inner side of the bank, because the owner, who had to make the bank and ditch originally, had to dig the ditch and throw the bank up upon his own land; the outer edge of the ditch being the outer boundary of his property. Now, in such cases, and they were extremely numerous, the Ordnance Surveyors had taken the centre of the bank as the line shown upon their maps, and as the line up to which they had scaled in the quantities contained in their Books of Reference. Further than this, much meadow land was described as "arable"; indeed, in some parts of Surrey, everything which was not woodland, or houses and gardens, was set down as "arable." Amongst improvements of the laws as to land which would be desirable, he advocated the compulsory enfranchisement of all copyholds, commutation of all tithes, and redemption of the land-tax, and finally and most important, some scheme for facilitating the transfer of landed property.

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WOODEN HOUSES AND MODERN COPIES.

The old-fashioned "post and pan" work, seen in the old houses and churches of Essex, and in many of the cottages in Kent, which some of our revivalists have been trying so much to bring into use again, promises to be developing in some parts into a species of cast work. The pargetting or rough-cast is retained, but the timbers are giving way to imitations in cement. In many buildings on the South Coast, we find attempts have been made to introduce this kind of relief, and the effect is quite satisfactory where a close imitation of timbering is not resorted to. Nothing would be in worse taste than to paint the cement framing to resemble wood, though we find this method has been applied. A stamped pattern in the parget work produces a rich relief where such ornament is used with moderation, but the rough-cast is equally effective. There is perhaps one reason why the modern timber-work fails: the houses built in imitation of old half-timbered work are generally devoid of the substance and character of the originals, and in many works we have seen the timbers are reduced to small scantlings, or they are simply superficial, and do not extend through the thickness of the wall. The employment of small timbers has rather thrown discredit on the work, for unless substantial framings are used the whole thing becomes a meaningless mockery, and unworthy of the architect. Concrete and cement open a new field of decoration, but it would be a misfortune to take the timbered cottages as models; the treatment might be more legitimately regarded as panel-work. For upper stories this plan of relief may be employed with advantage, and has a more finished appearance though less modest and picturesque than tile-hanging, which last was originally used as a protection to brick walls, and not simply as an ornamentation.

BUILDERS' BENEVOLENT INSTITUTION.

THE thirty-third anniversary of this Institution was celebrated by a dinner at the Freemasons' Tavern, on Thursday, the 11th inst., Mr. Thomas F. Rider, president, in the chair.

The chairman, in proposing "Success to the Builders' Benevolent Institution," entered into the history of the formation and growth of the Institution. The pensions, continued the chairman, have now, through the indomitable perseverance of my predecessor (Mr. F. J. Dove), been raised to £39 for men and £30 for women, necessitating, of course, a much increased outlay. One hundred and eighteen persons have enjoyed the benefit of the pensions, and there are now more than fifty on the books. For the next election, on the 25th inst., there are nine candidates, five men and four women. Gentlemen, on behalf of this Institution, I now appeal to you. Strikes and lock-outs—those barbarous inventions for settling quarrels between masters and men—fierce and unhealthy competition, the bane of all our commercial pursuits; accidents through the carelessness of men, and many other similar matters, combine to render the building trade one of the most uncertain in existence. In proof of this, I may state that one of the applicants for the benefit of the charity is the widow of a former member of the committee, a liberal subscriber to our funds, and we very soon expect to receive an application from the widow of a partner in one of the largest building firms in London, who was ruined by carrying out a large contract at the West-end. I therefore appeal to the master builders of London to support this charity on the ground that some of them may some day or other require its assistance, and I appeal to them on the common ground that those who are engaged in the same business as one's self have a prior claim on our charity, and I appeal to you to make the Builders' Benevolent Institution one of the best charities of the charitable metropolis of the world. With the toast I have much pleasure in coupling the name of our excellent friend Mr. George Plucknett.

Mr. Plucknett having briefly replied, the secretary (Major Brutton) announced a list of subscriptions and donations amounting to £1,014 16s., of which sum the chairman's list alone (including £52 10s. given by himself and £52 10s. given by Mrs. Rider) accounted for £662 18s.

Mr. Edward I'Anson, in proposing "The Chairman and President," stated that during the fifty years he had had business relations with the Messrs. Rider, he had learnt to highly steem them.

The remaining toasts were "The Vice-Presidents and Trustees," proposed by Mr. Glanvill and responded to by Mr. F. J. Dove; "The Architects and Surveyors," proposed by Mr. Ex-Sheriff Burt and responded to by Mr. I'Anson and Mr. Franklin; and "The Committee and Stewards," proposed by Mr. Grimwood, and responded to by Mr. T. G. Smith and Mr. Randall.

[It will be seen by advertisement on front page that, as a result of the large donations received at the dinner, the committee will be enabled to elect, at the meeting to be held next Thursday, two men and two women, instead of one man and one woman as originally proposed.]

A NEW STOVE.

DR. C. W. SIEMENS has made many experiments with gas-stoves and with different kinds of fuel, with a view to the prevention of smoke and the economy of heat, and, in an article contributed to *Nature*, he has shown that it is cheaper to burn the constituents of coal in their separated state than as they exist naturally; that is, a fire consisting of coke rendered and maintained incandescent by a supply of coal-gas is cheaper than one in which coal pure and simple is consumed. A gas-grate arranged in his billiard-room, in which the pipes were covered with pumice-stone, presented not only a cheerless appearance, but filled the room with fumes. "The products of combustion set up by the gas-flames ascend no doubt so long as they are intensely hot, but in giving off their heat to the inert pumice-stone they rapidly cool, and, being heavier than atmospheric air, descend through the grate between the lines of gas-flames, and thus reach the apartment." This use of pumice or lump asbestos has become very fashionable where gas-fires are preferred to coal, and when the stove is properly constructed so as to carry away noxious fumes, the fires are not only cheerful but economical. According to Dr. Siemens the first condition to be realised in an efficient gas-grate, consists in suppressing all gas orifices except immediately behind the bottom bar, while the grate is made as a solid dead-plate. Instead of using pumice-stone, he prefers, as being more economical and efficacious, to transfer the heat of the gas-flames to coke or anthracite, which, when once heated, helps the gas to increase and maintain a sufficient temperature for radiation through its own slow combustion. This use of the gas in the front of the fire gives the cheerful appearance so much desired, and the hot carbonaceous matter through which it passes on its road to the chimney, insures its complete combustion, and the minimum of wasted heat. The coke or anthracite under these conditions is practically in a very slow combustion stove, but, notwithstanding the absence of grate-bars, the mass of fuel becomes red throughout, and heat is lost at the back, or is not utilised as it might be. To remedy this defect, Dr. Siemens has devised an arrangement which yields the remarkable results above mentioned, and which is thus described in the *English Mechanic*:—An iron dead-plate is riveted to a plate of copper ¼in. thick in such a manner that the copper plate extends 5in. above and below the point of junction. This copper-plate forms the back of the fire-grate, and the iron-plate is the bottom. The latter extends to within 1in. of the lowest bar, and its lower surface is level with the upper edge of the bar which fits close to the iron bottom of the stove. This bottom plate is fitted with a trap-door opening downwards for the removal of ashes, and at the back it is bent downwards for a few inches, forming a passage for a current of air. It will be understood that there is thus a hollow bottom to the grate, and in the front part of this, just behind the lowest bar, is a ½in. gas-pipe with holes about 1-20in. in diameter, spaced zigzag about ¾in. apart. Thus, when the gas is ignited, the jets play over the edge of the dead-plate through the inch space left between that and the lowest bar. As the mass of coke or coal becomes hot, the heat is imparted to the copper plate forming the back of the stove, and here is the great merit of the device. The portion of the copper plate beneath the dead-plate—that is the part in what would be the ash-pit—is fitted with a frill of thin copper, that is, a corrugated sheet which is riveted to the stout plate, and fills up the space left between the portion of the iron plate which is bent down and the copper back. Copper being a good conductor of heat, the frill soon becomes hot, and the corrugations or frills, which are arranged vertically, impart heat to the air which passes up through them to the hollow bottom of the grate, where it impinges against the gas-jets, and increases their brilliancy. A piece of lead, about half a pound in weight, placed in this hollow bottom or air-passage through the trap-door, melted in five minutes, proving that the temperature exceeded 619° Fahr. An ordinary stove can be modified to suit gas, by simply placing a close-fitting ash-pan beneath the grate-bars and running the gas-pipe behind the lowest bar; but the fire will be less brilliant than when the hot-air arrangement above described is adopted. The consumption of gas and coke per day of 9 hours was found to be 62 cubic feet of gas and 22lb. of coke, which, at 3s. 6d. per 1,000 cubic feet, and 18s. per ton respectively, give a total of 4·725d., or ·524d. per hour. The same grate before conversion consumed about 47lb. of coal, which, at 23s. per ton, equals 5·7d., or ·633d. per hour. The alteration thus gave an economy of one penny per day; but what is of more importance, there is now no difficulty in keeping the temperature of the room at 60° F., which never could be done when the fireplace was a coal-grate. Add to those facts another—that the fire is now smokeless, and the advantages of Dr. Siemens' stove are apparent. The first cost of such a grate will, of course, be considerable, but it will probably not be more expensive than many of the stoves, patented and otherwise, which at present are soliciting public patronage. Dr. Siemens has taken up the question without the idea of profit, and he will supply builders and others with the necessary directions to insure success.

TESTS FOR GOOD IRON.

A FEW clear rules are necessary to prevent misapprehension as regards the quality of iron. A hard iron is generally brittle, and will soon snap under a sudden strain. A good iron for building purposes ought to be ductile, or capable of stretching before it gives way; and this ductility can be measured by the amount of elongation of the bar, or by the amount of contraction of area of section due to the tensile strain. Mr. Kirkaldy's conclusions on this point ought to be kept in view by all engineers and architects. He observes, in short, that the tensile resistance of a piece of iron is not a fair measure of quality. The experiments made by that gentleman have conclusively shown that—"1, the breaking strain does not indicate the quality; 2, a high breaking strain may be due to the iron being of superior quality, dense, fine, and moderately soft, or simply to its being very hard and unyielding; 3, a low breaking strain may be due to looseness and coarseness in texture, or to extreme softness, though very close and fine in quality; 4, the contraction of area at fracture, previously overlooked, forms an essential element in estimating the quality of specimens; 5, the respective merits of various specimens can be correctly ascertained by comparing the breaking strain jointly with contraction of area." The engineer or architect, therefore, may rely mainly upon the contraction of area or the measurement of the elongation; the last, perhaps, is the easiest method of testing. In specifying iron for structures it is not sufficient to state the amount of tensile stress it can bear; the least elongation must be stated also in terms of the original length of the specimen. The specification may run thus:—"All iron used to be tested by—[here state name of testing establishment], and to be capable of resisting a tensile stress of—— per square inch with a minimum elongation of so much per cent." The table of tests used by the India Office show, under class C, an ultimate stress for round or square bars per square inch of 27 tons, and a contraction of area of 45 per cent.; under class D an ultimate stress of 26 and contraction of area of 35; under E a stress of 25 tons and a contraction of 30 per cent.; under F a stress of 24 and a contraction of 25, and under class G a stress of 23 and a contraction of 20 per cent. Flat bars are given a trifle less. Taking class G, the ultimate stress is 22, and contraction at fracture 16; angle and T-iron of the same class shows a test of 21, and a contraction of 12 per cent. For plates with the grain lengthwise, the tests range in all the above classes from 24 tons per square inch to 20 tons; those with grain crosswise, 22 tons in class C to 17 in class G. If the iron is wanted for a particular purpose, it should stand testing under class E, which is the average; and the all-good, or BB irons, are capable of undergoing it. Ordinary B iron might be specified to stand the lowest tests given above, or those recorded under class G: and the best Yorkshire might stand the highest test we have mentioned. It is usual to specify it for all important works subjected to unusual stress or sudden shock. But there are so many varieties in the market, that the only sure plan is to test all specimens, and not to trust to particular brands. Even bending a plate of iron, hot or cold, with and across the grain, is a good means of testing for ordinary purposes. The Admiralty directions on this point may be followed. Thus, the best-best plate-iron with grain lengthwise, 1in. thick, should bend 125° when hot, when cold 15°: sheet-iron may be tested to bend to 90° when cold. When the grain is crosswise the angle bent for plate-iron is given at 90° when hot, and 5° when cold. These angles are of course those through which the iron should bend without cracking.

CONVERSION OF DWELLINGS INTO SHOPS.

THERE are many old houses in London, originally built for private dwellings, which are yearly absorbed in the ever-growing demand for shops. These houses are found more especially in the suburban districts, where new accessions of building in the outskirts gradually draw residents farther out, thus creating vacancies in the older thoroughfares which become devoted to trade. In the districts of Holloway, Islington, Finsbury-park, Camden-town, Hammersmith, and Kensington, as well as in the southern suburbs of Camberwell and Brixton, old well-built houses of several stories are to be seen, which, one after another, fall a prey to the insatiable shopkeeper. Many of these rows are some feet from the thoroughfare; they often stand back within a small fore-court, and having been built when land was cheaper, and speculative builders were scarce, possess a good piece of garden-ground in the rear. The process of conversion is after this fashion:—The fore-courts are inclosed by boarding, and the few shrubs and trees which long afforded shelter, are rooted up; where the party fences stood, huge walls of brick 14in. in thickness take their place, and these are carried up to the height of the first story. Upon them cross-beams of timber or rolled iron girders are placed to support a flat skylight; a shop-front is introduced at the pavement, a floor laid upon the scantiest of joists, the space below being partially excavated for cellars, and the shop is now finished for occupation. In some cases, the skylight is raised just above the windows of the ground-floor room to light it, but in many cases the wall of this story is removed and thrown into the shop, and the upper part of the old house-front is supported on a bressummer. It would be difficult to imagine a more ready way of converting a house into shop premises; the house remains virtually the same while the shop is added to it as a front building. The effect of this kind of construction may be seen in Edgware-road, Euston-road, Walworth-road, and Camberwell-road, where miles of old houses once built for private residences are yearly transformed.

But why, it may be asked, cannot the builder make these front erections a little more sightly? In the examples we have mentioned, they look more like a row of temporary sheds than anything else; they spoil the rooms behind them, and in very few instances do we find that private entrances are left to the houses which they partly conceal. It is well worth consideration, seeing so many old streets are being left to the mercy of the builder. Cannot, also, the Metropolitan Board of Works exercise a little authority over the kind of front inserted and the mode of roofing? To throw out a suggestion, why cannot the roofs be turned to some account? Let the flat be substantially laid down with asphalte upon concrete arches or slabs with prismatic lights, in preference to timber or iron; let the space be railed off for recreation, or converted into a small garden to cheer the eyes of those who have to dwell behind them. If a little more ingenuity were exercised, and plate-glass were not so persistently demanded, the fronts might be treated artistically. In a long line of street, a colonnado or covered passage along the fronts might be constructed, possessing the double advantage of affording shelter from the sun and rain. But, as Mr. Barry said the other evening, we aro not likely, under our system of metropolitan government, to get anything like uniformity in the remodelling of our streets; English tastes are controlled by individual wants and fancies, although we may hope for the day when a committee of taste will exercise a control over tho remodelling of our old thoroughfares as well as the reconstruction of new streets. The clauses touching projections and shop-fronts in the Building Act are too incomplete to be of any service in improving buildings of this kind, and the architect is restricted to the barest requirements of his employer.

In the remodelling of old buildings, as for example the insertion of a new front, people are inclined to follow in the groove. They are content to do what their next neighbour has done. Hence it is not strange that terra-cotta has found so few to introduce it as a building material admirably adapted to the purpose of a small front with large openings. In the introduction of a new front to an old building, the pilasters or supports, the transom and upper lights, might be easily cast into a few pieces, and fixed together like a frame of timbers. The bressummer itself might be formed of concrete, with iron bars inserted, and the end-piers or mullions of the same material or terra-cotta, avoiding the construction of brick or decaying stone piers, and saving a good deal of the wooden framing. In case of fire they would be more indestructible than iron beams or wooden story-posts, and they are materials that would be free from the unsightly settlements and fractures so frequently seen. We might imagine a front completely filled in with moulded terra-cotta windows, to suit Queen Anne or any other style, and we express a conviction that if architects were to employ this material instead of wood, some architectural freshness might be imported into our streets.

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Liverpool Architectural Society. — The annual dinner of this society was held on Tuesday, October 5th, at the Alexandra Hotel, Dale-street, forty-four members and guests being present. The first ordinary meeting of the society was held on the following day, October 6th, the President, Mr. Charles Aldridge, F.R.I.B.A., in the chair. After the election of members and other business, the report of the visitors on last session's work by members of the class of construction and design was read, the first prize being awarded to Leonard J. Pilkington, and the 2nd to Constantine Phillips. The President then read his opening address.

SCHOOLS OF ART.

Chesterfield.—The third annual distribution of prizes to the students in the science and art classes took place at the Stephenson Memorial Hall on Thursday week. The report stated that the finances and work of the schools continued to flourish under Mr. T. C. Simmonds, also head-master of the Derby School of Art. The attendance had not been so large, but the results were much greater; 50 out of 70 candidates at the April Examinations were successful; 31 as excellent, and two obtained 3rd grade prizes; 1,481 drawings were sent up for examination, but only 7 were returned, and these obtained one free scholarship and three third-grade prizes. The grant this year was the largest yet received, £99 17s. 6d.

Salisbury.—An exhibition of the works of the art pupils of the Salisbury School of Art, was opened in the Council-chamber, Salisbury, on Thursday week and two following days, and attracted a large number of the friends of the pupils and supporters of the school. The works comprised those which had been sent up to South Kensington, as well as those sent in for the local prize competition. Altogether the exhibition was an admirable one, the prize and other drawings showing considerable talent on the part of the students, and that the school still maintains the high position amongst the art schools of the kingdom which it has so long occupied. The distribution of the Government prizes and certificates, as well as the local prizes, took place on the evening of Thursday, the Mayor of Salisbury (Mr. E. F. Kelsey) presiding, and opening the proceedings. Highly satisfactory reports of the Schools of Art and Science were read by Mr. W. Jonas Wilton, one of the hon. secs. of the schools, after which the Dean of Salisbury, in moving the adoption of the report, delivered an address on the subject of art education, and its importance particularly in elevating and refining the tastes of the people. The Ex-Mayor seconded the adoption of the report, which, on being put from the chair, was carried unanimously. The prizes and certificates were presented by the Dean. Tho national silver medal was awarded to Gideon Fidler, for a carpet design; and the national bronze medal to Jane J. Collis, for muslin designs. After the presentation some excellent addresses were delivered by other gentlemen present in moving and seconding the usual resolutions.

COMPETITIONS.

Broadstairs.—At the last meeting of the local board seventeen plans were examined, which had been sent in by competing engineers, for the drainage of the district. The estimates of cost varied from £4,994 to £26,000. After considerable discussion, in which a strong opinion was expressed against discharging the sewage of a watering-place like Broadstairs into the sea, it was decided to discuss, at the next meeting of the board, the four schemes providing for the utilisation of the sewage.

Proposed School of Art, Liverpool.—The drawings for the above competition were sent in on Monday, the 15th inst. The large number of ninety-six sets of designs, comprising 598 drawings, have been received. The mottoes submitted with the design are as follows:—

Apollo, Che Sara Sara, Let there be Light (2), Live in Hope, L. S. A., Economy, Faith, Con Amore, Slade, Progress, Virens in Arduis, Mercia, Simplicity, Fides, Antique, Loco, I strive for Art, A'Lorburn, Corona, Studio, Excelsior, Finem Respice, As You Like it, Percy, An Old Boy, Lux, 0881, Straightforward, Ex Propriis, Courage Sans Peur, Desidero contigère Signum, Æquanimitas, School of Art, Scuola dell'Arte, Omega, Good Light and Air, Delta, Grosvenor, Anchora Speme, Chacun à son Gout, Half Moon, Ars Longa Vita Brevis, Doonie, Deus Nobis hæc Otia Fecit, Light and Air, Pour y Parvenir, Onward, N. N. E. by N., South Kensington, Progrés, Fiat Justitia, Cum Martie Minerva, Edwin, L. Juset, Frau, Norr, Neo Grec, Spes, School, Hæc Meta Laborum, Caveto, Excelsior in circle, Alberti, Kensington, Coup de Main, Simplex (4), Spero (2), Plan, Plan in circle, Art (7) North Light (2), North Light in circle (2), Light, Ligh in circle, Aurora Borealis (2), Mersey (2), Ars (3).

Queenstown, South Africa.—The premium for the best design submitted in public competition connected with the rebuilding of St. Michael's Church, has been awarded to Mr. W. H. Reid, architect, of Cape Town, and formerly of Newman-street, Oxford-street, London, W. Tenders will shortly be invited, and the work commenced at an early date in the ensuing year.

Raikes Memorial Church, Gloucester.—The committee for the erection of this church received more than forty sets of designs and drawings, of which eleven have been selected for further consideration. The motto system does not seem to be adopted, for the local papers mention that amongst the eleven designs selected for further consideration, are those sent in by Messrs. Waller and Son, Messrs. Medland and Son, Mr. Capel Nankivel Tripp, and Mr. J. P. Moore, all of Gloucester.

Stratford-on-Avon.—In a competition for plans for a new cemetery at Stratford-on-Avon, 29 sets were sent in by competitors. The design by Messrs. Wood and Kendrick, of West Bromwich, has been selected, Mr. T. T. Allen, of Stratford-on-Avon, is placed second, and Mr. Lettimer's third.

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At a meeting held at Bagshot on Saturday week, under the presidency of the Duke of Connaught, the question of the desirability of restoring Bagshot Church was discussed, and it was resolved that better church accommodation is absolutely necessary, and that an architect be appointed to report on the present edifice, and give estimates of the cost of building a new one to seat 450 persons, and for restoring the present one. A committee was appointed, with the Royal Duke as president.

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ILLUSTRATIONS.

NEW MUNICIPAL BUILDINGS, HASTINGS.—PLAS LLANYCHAN.—BALLYCULTER CHURCH.—BRIGADE DEPOT, OXFORD.—COFFEE TAVERN, WOOLWICH.

OUR LITHOGRAPHIC ILLUSTRATIONS.

HASTINGS MUNICIPAL BUILDINGS.

THESE buildings, of which we give geometrical drawings this week, are being carried out under the direction of the borough surveyor—Mr. William Andrews—for whom the designs have been made by Mr. Hy. Ward. The plan provides accommodation for all officers connected with the town, including police court, 50ft. by 30ft., waiting and witnesses' rooms, jury room, grand jury's room, and magistrates' rooms. On the first-floor are council chamber, 50ft. by 30ft., committee room, 27ft. by 18ft., and offices for the borough surveyor. A mayor's private room in connection with the council chamber is also provided, and cloak-room and lavatory accommodation on each floor. Six large spare offices for future use, if required, are provided over the main building, but these will not be completed at present, except so far as the floors are concerned, as it is not likely they will be required for considerable time. At the rear of the main building, and approached from Station-road, is the police department, provided with private offices for the superintendent, charge room, constables' day room, and sixteen cells. On the first-floor of this department are rooms for the use of a caretaker, besides some small spare offices. The apex of triangle next Station-road is occupied by offices for inspector of weights and measures, and borough surveyor's pay office, with two good spare rooms over. The style of the building is Gothic, the outside walls being constructed of a local blue stone with Bath stone dressings. The finishing to principal rooms will be in pitch-pine. The roofs will be covered in permanent green slates. Messrs. D. C. Jones and Co., of Gloucester, are the contractors.

PLAS LLANYCHAN.

PLAS LLANYCHAN has been rebuilt, on the foundation of an old house which was in a dilapidated condition, for John Taber, Esq., of Claremont, near Ruthin. The work has been carried out by Mr. John Price Williams, of Ruthin, from designs and under the superintendence of Mr. Arthur Baker, architect, of 14, Warwick-gardens, Kensington, at a cost of £2,000.

BALLYCULTER CHURCH, DIOCESE OF DOWN, IRELAND.

THE usual type of country church found throughout Ireland is not interesting, to say the least. It is a barn-like, poverty-stricken building, mean in its materials, and with no greater pretensions to architectural character than it can assume on the strength of some Carpenter's-Gothic wooden mullioned windows, with cast-iron lozenge-shaped glazing, rough dashing without, plain plastered walls within, and a flat plastered ceiling. The existing church, shown as remodelled in the illustration, is no exception to the rule, being an ill-proportioned, cruciform structure, with a rude tower and rubble-built spire. It has been desired to transform it into a building worthy as a memorial of the late Dowager Countess of Bangor, without obliterating all remnants of the old church, in which she was interested during a long life. Some ingenuity has been exercised in wholly changing the plan and proportions, while preserving the existing walls. The centre-line of the nave has been shifted over to the north 2ft., dividing the old east end into chancel and organ-chamber, and extending eastward, while an arcade is introduced on the south side, with an aisle-passage outside it. This leaves the old south transept of its present dimensions, while the north transept is curtailed into a side-chapel for the Bangor family. The tower at the west end will, under the altered plan, not come in centrally with the nave; but by introducing a ringers' gallery, or screen, at the west end, formed by a double arch, the irregularity is provided for, one arch central with the tower being the entrance, and the other forming a baptistery. This arrangement does not appear upon the sketch-plan, as it is to be executed. The materials used will be Bath Corsham Down stone for the interior; red Dumfries stone for exterior, and red tile roof. The contract has not yet been let. The architect is Mr. Thomas Drew, R.H.A., of Dublin, diocesan architect for Down, &c.

BRIGADE DEPOT, OXFORD.

APROPOS of Mr. Ingress Bell's paper on "Barracks," read on Monday at the R.I.B.A., we are able to give an illustration of the New Keep forming part of the Brigade Depôt at Oxford. It comprises the guard-room and accessories, and the store for arms and accoutrements. It is a type which has been used generally in the new brigade depôts built, or building, under the Military Forces Localisation Act of 1872. The architecture is severe, as befits its purpose, and the structure is effective from its mass, which is considerable, and from the simplicity of its parts and inclosing lines. We hope hereafter to be able to give further particulars of this interesting and unique class of buildings, of which so many examples have been recently constructed.

COFFEE TAVERN AND PUBLIC HALL, WOOLWICH.

THIS building which has been erected from the designs of Mr. W. Rickwood, architect, of Plumstead, was opened by the Duke of Connaught on the 30th ult., and was fully described on p. 545, *ante*. Messrs. Lonergan and Sons, of Plumstead, are the builders.

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THE NEWTOWN CHURCH COMPETITION AT EXETER.

IN our last issue we announced that Mr. Robson, architect, of London, in his award in this competition, had placed the designs of Mr. R. Medley Fulford, first; and those of Mr. E. Webb, second. Five of the seven sets originally sent in were on view one day last week in the old College Hall at Exeter, and the public generally have had an opportunity of judging for themselves as to the respective merits of the various works. The other two competitors declined to exhibit. Four out of the five are of a Geometrical or Early Decorated character, the other being of the Byzantine or Romanesque style—the design reminding one somewhat of Wyatt's well-known church at Wilton.

This design, shown under the motto of "Cui Bono," received the second premium of £25, and was the work of Mr. Edward Webb, architect, of the Cathedral-yard, Exeter. The elevations show a tall campanile at the north-west, and from it a passage along the west end, with a semi-circular, on plan, baptistery in the centre. The clerestory has large windows in couplets. The design is well suited for a brick church, and the drawings, although in an unfinished state, show much taste.

"Omnia diligentia subjiciuntur" (Mr. Edward Ashworth), in a series of six neat, carefully got-up drawings, shows designs for an excellent church of Geometrical character. The transepts, like those of the cathedrals of St. Peter's, Exeter, and St. Stephen's, Vienna, as also the interesting old church of Ottery St. Mary, in Devonshire, form the base of the towers, save that, in Mr. Ashworth's design, a north tower only is provided. This terminates with a wood spire covered with lead—a treatment that has many local precedents.

Altogether the design is, both as regards plan and elevation, an excellent one, and such a church would be admirably adapted for congregational purposes. Provision is made for a west gallery, reached from the western doorway, the adoption of which would be optional. The whole might very well be built for the £6,000.

"Si fortuna juvat" (Messrs. Hayward and Son) shows, like the other competitors, the usual nave, aisles, transepts, chancel aisles, &c., and is also of Geometrical character. There is a north-west tower of good proportions having a large stair-turret surmounted by a spirelet on the angle, and a pyramidal roof over the battlements. This tower, although of earlier detail, has much of the feeling about it of the west country towers. The transept gables include porches, whilst the length of the nave clerestory is relieved by two gablets rising at intervals, each containing two windows. A ventilating flèche breaks the monotony of the nave roof ridge. A narthex runs along the western end from the tower. This gives access to the western doors. The arcades are supported by Devon marble columns. These drawings were well got up in brown, and apparently in no way exceeded, by what they proposed to do, the cost named.

The successful plans bear the motto of "Laus Deo," and are in the Early First Pointed style. The walls are of red brick, relieved by Ham Hill and Bath stone dressings. The brickwork will show on the interior walls, and provision is made for bands of tiles therein, with figure subjects painted thereon. The nave arcades of four bays are carried by monoliths of red Devon (Dartmoor) granite. The plan is nearly a parallelogram showing double transepts of not very great projection. There is a tower at the north-west angle, surmounted by a steep saddle-back roof, with a tall spirelet rising again from out of it. Over the arcades is a simple clerestory of two light windows. The roofs are of pitch-pine and slated. At the north and south of the chancel are priests' and choir vestries connected by a corridor. The arrangement for communicants is good. Mr. Robson, in his report in awarding the first premium of Mr. Fulford's designs, spoke well of them generally, but especially drew attention to the excellence of the planning, which, whilst in some respects of unusual character, he defined as among the very best he had ever had an opportunity of seeing. As for cost, he thought that, so far from being in excess of the £6,000, the edifice might be built for some hundreds less. The total length of the church inside is 118ft., width, 63ft., and the height to the ridge 50ft., with accommodation for 800.

In striking contrast to the quiet set of drawings Mr. Fulford and the others we have mentioned sent in, were the series of 8 exhibited by "Confidence" (Mr. E. H. Harbottle); a Late Early English church, having a bold-looking tower with lofty stone spire at the south-west end, and bold transepts; the nave roof is arched with plain boarding and moulded tie-beams and king-posts. The chancel aisles are wide, and the chancel has a semi-octagonal termination.

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CHIPS.

The foundation-stone of a new Wesleyan school chapel was laid in Bolton-road, Darwen, on Saturday week. It is Gothic in style, and is being built of local parpoints, with stone dressings, the whole of the internal fittings being of pitch pine. Accommodation for 400 adults is provided in the principal rooms, and two classrooms and two vestries adjoin. Messrs. Thackeray and Woods are the architects; the cost will be £1,000.

At Tamworth, on Tuesday week, Captain Hildyard, an inspector of the Local Government Board, held an inquiry into an application by the urban and rural authorities, to borrow conjointly £7,000 for the completion of the waterworks now in course of construction. Mr. Marten, C.E., of Wolverhampton, the engineer, stated in the course of his evidence, that he rarely ever knew a scheme of so great a capacity to be carried out at so small a cost; it was expected to raise a million gallons of water per day at an initial cost of £22,000.

At a meeting of the local board of Brownhills, near Wolverhampton, held last week, the tender of Mr. A. Palmer was accepted for the construction of works of sewerage for the district, from the plans and under the superintendence of Mr. Shipway, engineer to the board. At the same meeting, Mr. Tickle, of West Bromwich, was elected as clerk of works during the construction at a salary of 2½ guineas per week.

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Brigade Depôt: Oxford – Keep and Entrance Gates.

Illustrating paper by E. Ingreſs Bell *Architect.*

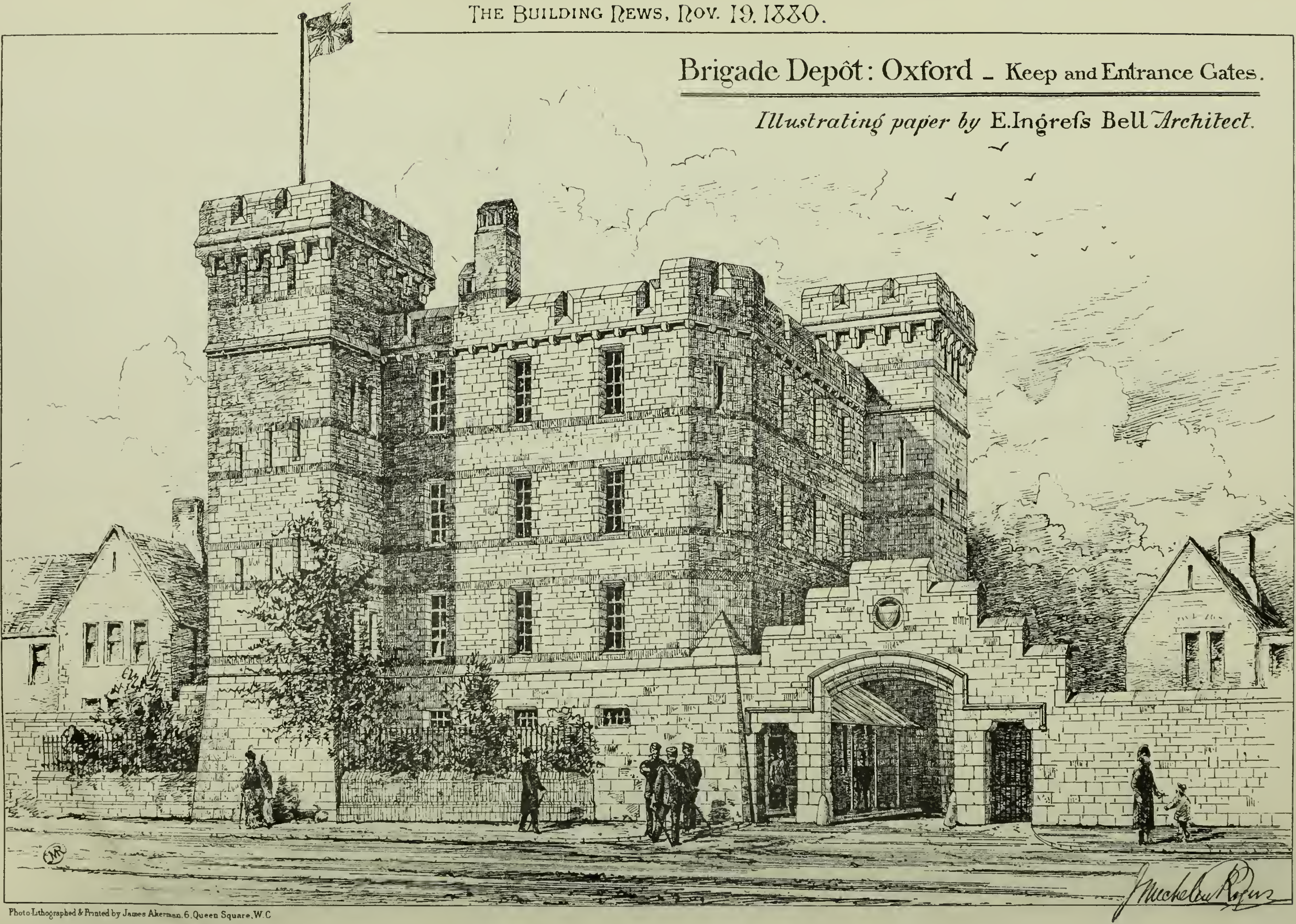
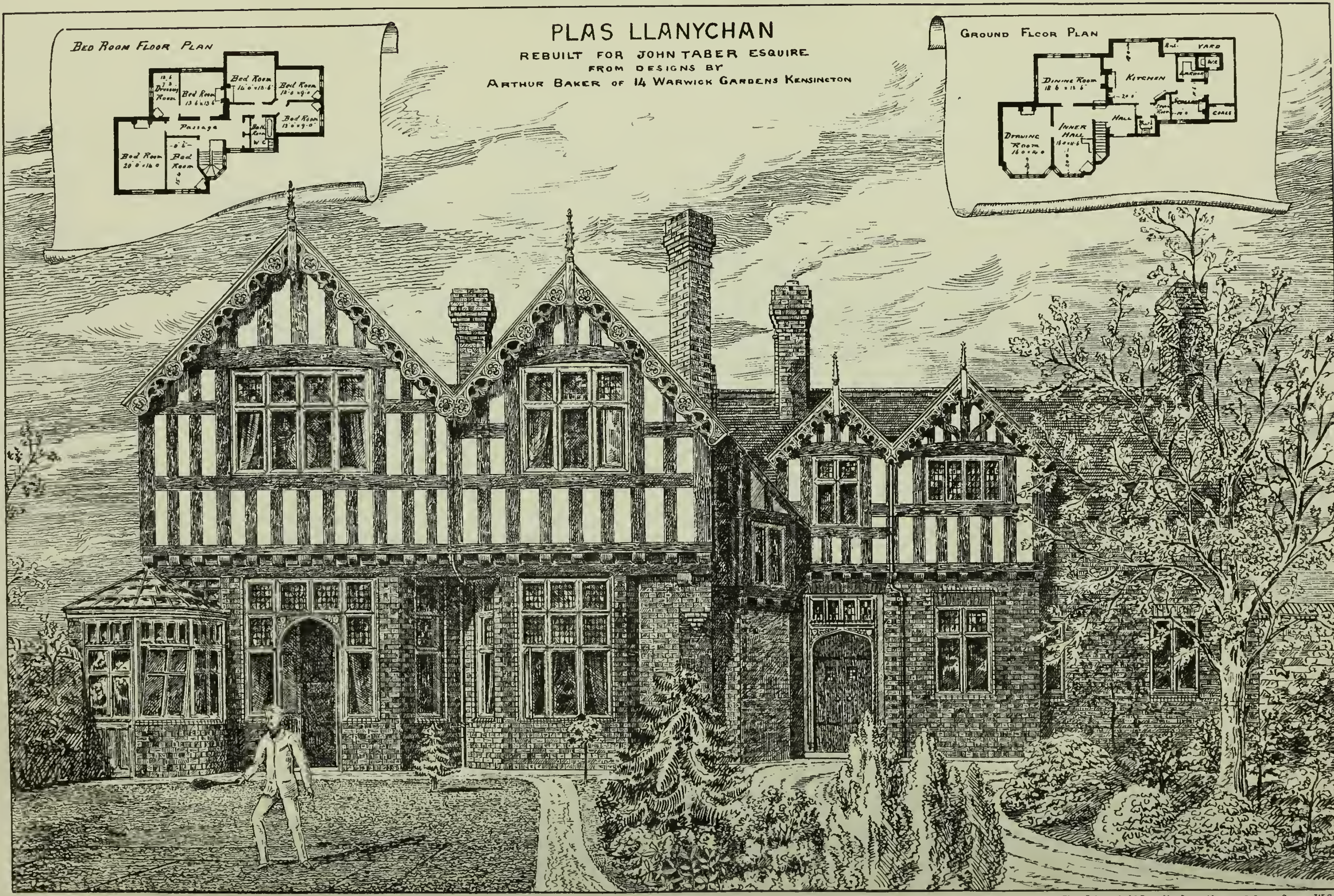


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

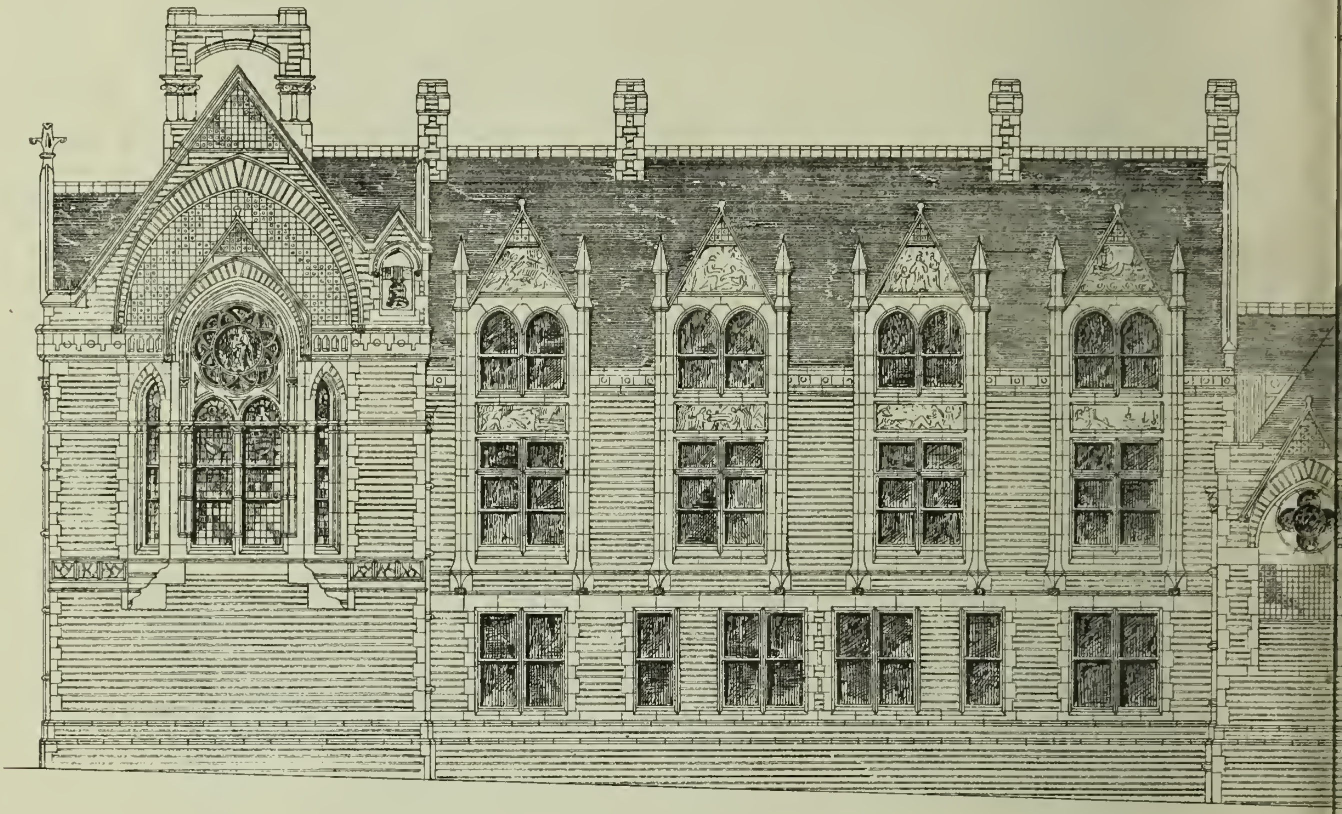


PLAS LLANYCHAN

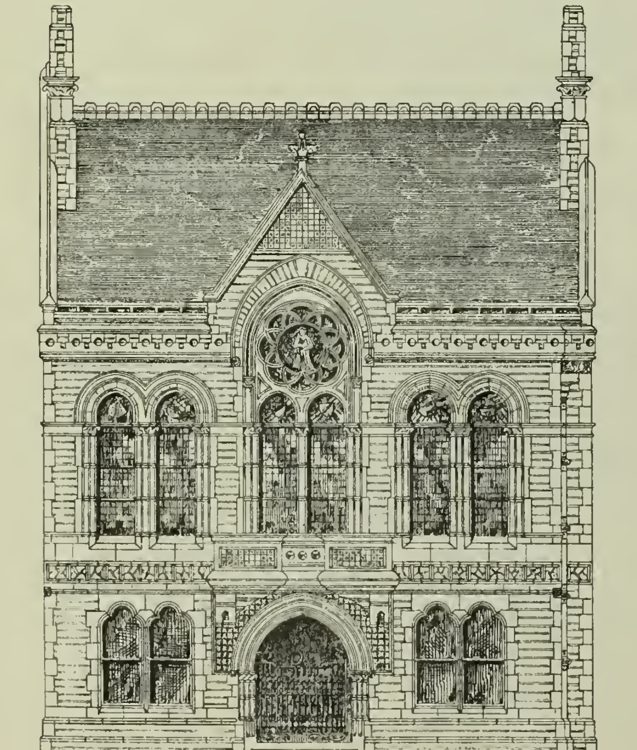
REBUILT FOR JOHN TABER ESQUIRE
FROM DESIGNS BY
ARTHUR BAKER OF 14 WARWICK GARDENS KENSINGTON

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

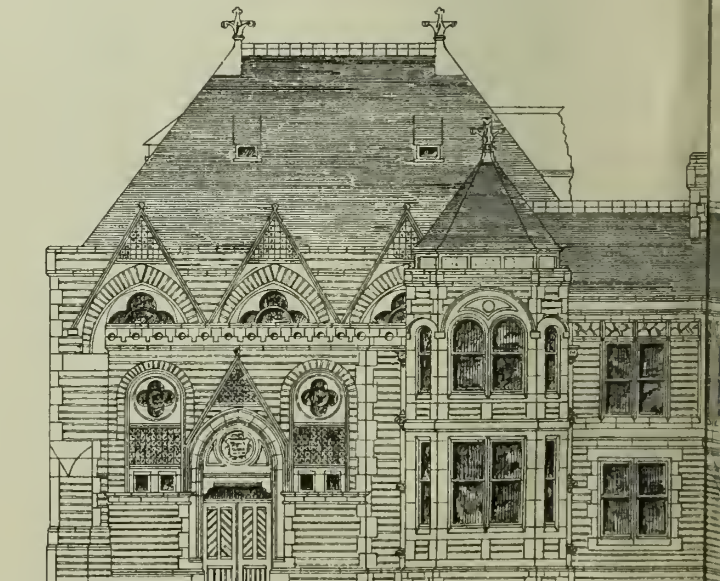
NEW MUNICIPAL B



·NORTH·ELEVATION·



·EAST·ELEVATION·

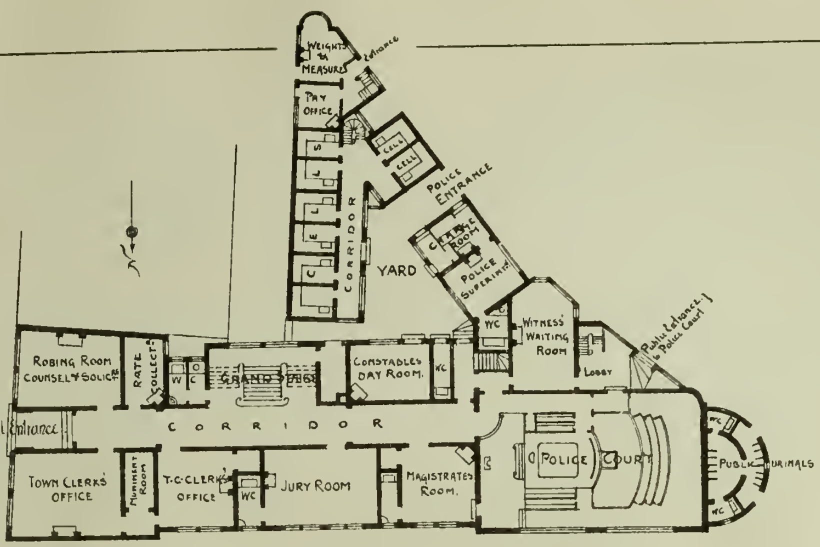


WEST

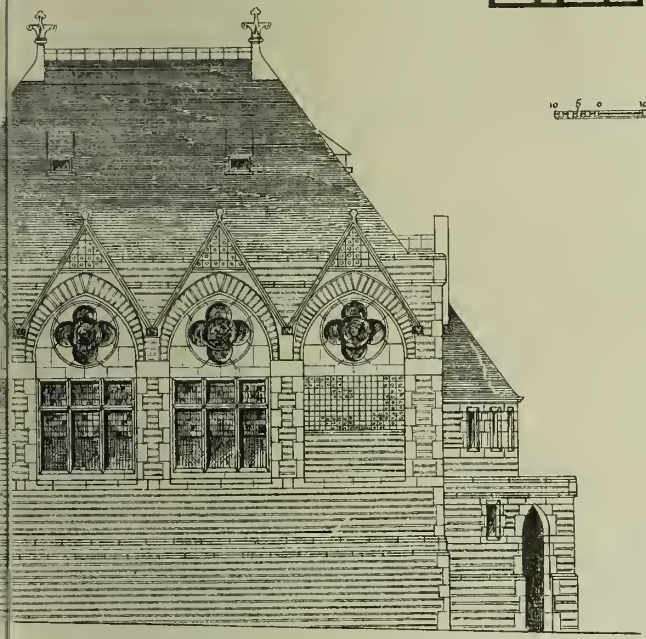
Designed & drawn
by Hy Ward:

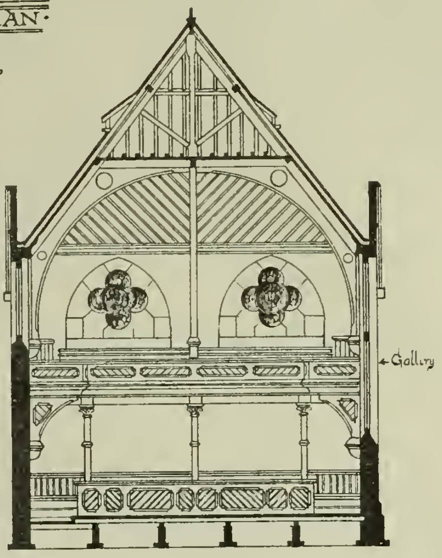
ILDINGS

HASTINGS

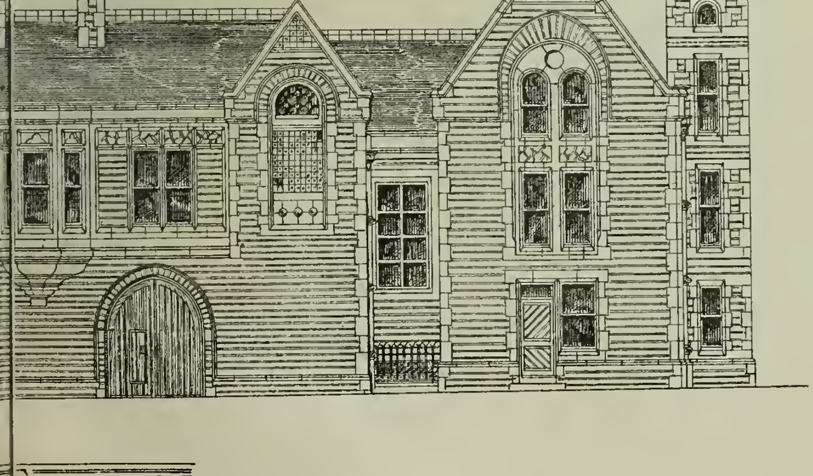


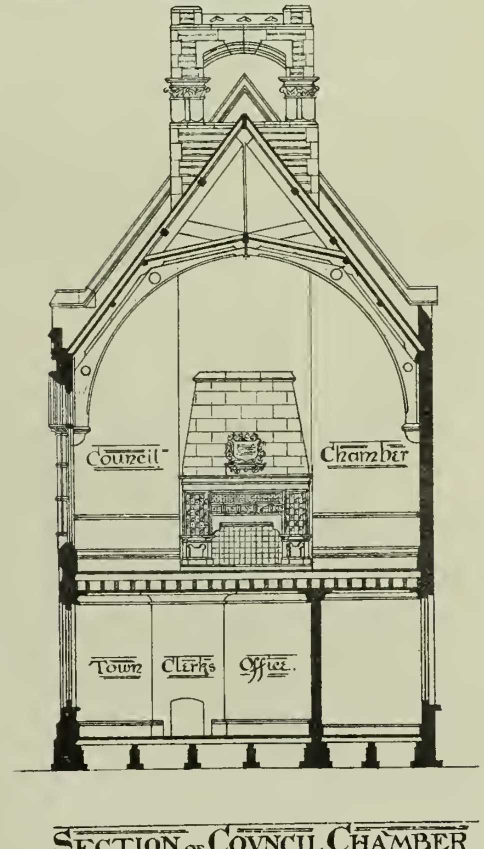
·GROVND·PLAN·





SECTION OF POLICE COVRT



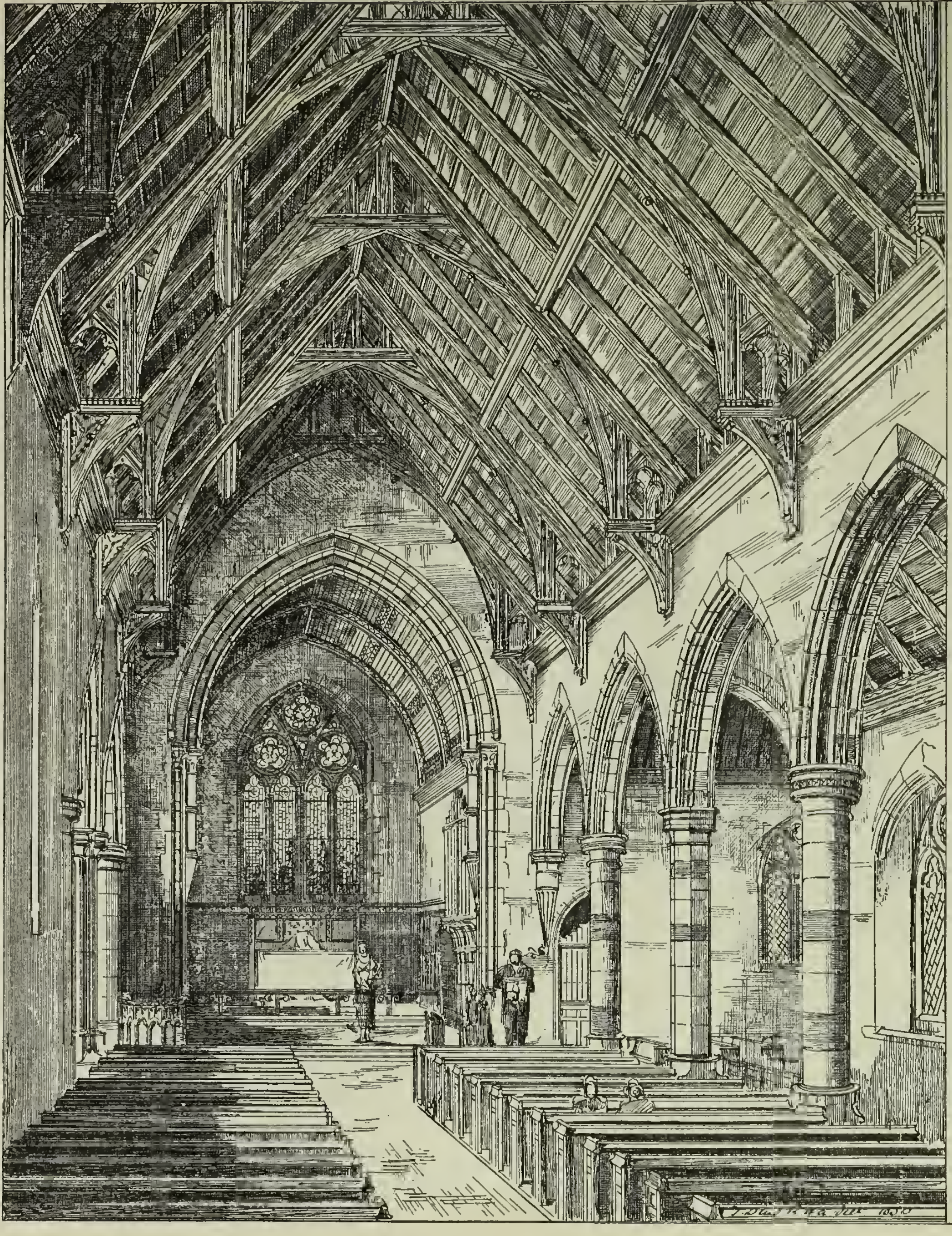


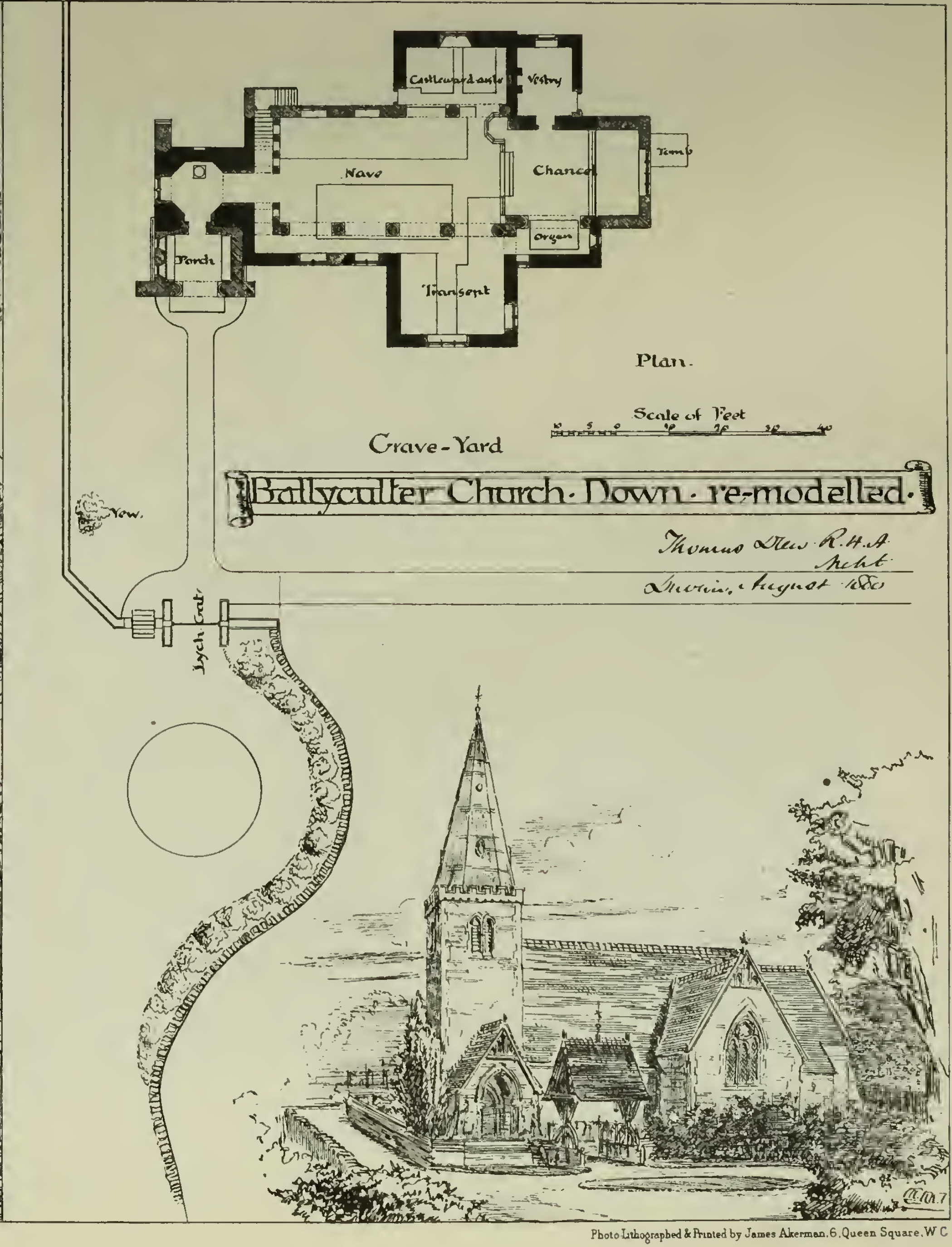
ELEVATION

SECTION OF COVNCIL CHAMBER

Wm Andrews.
Borough Surveyor.

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

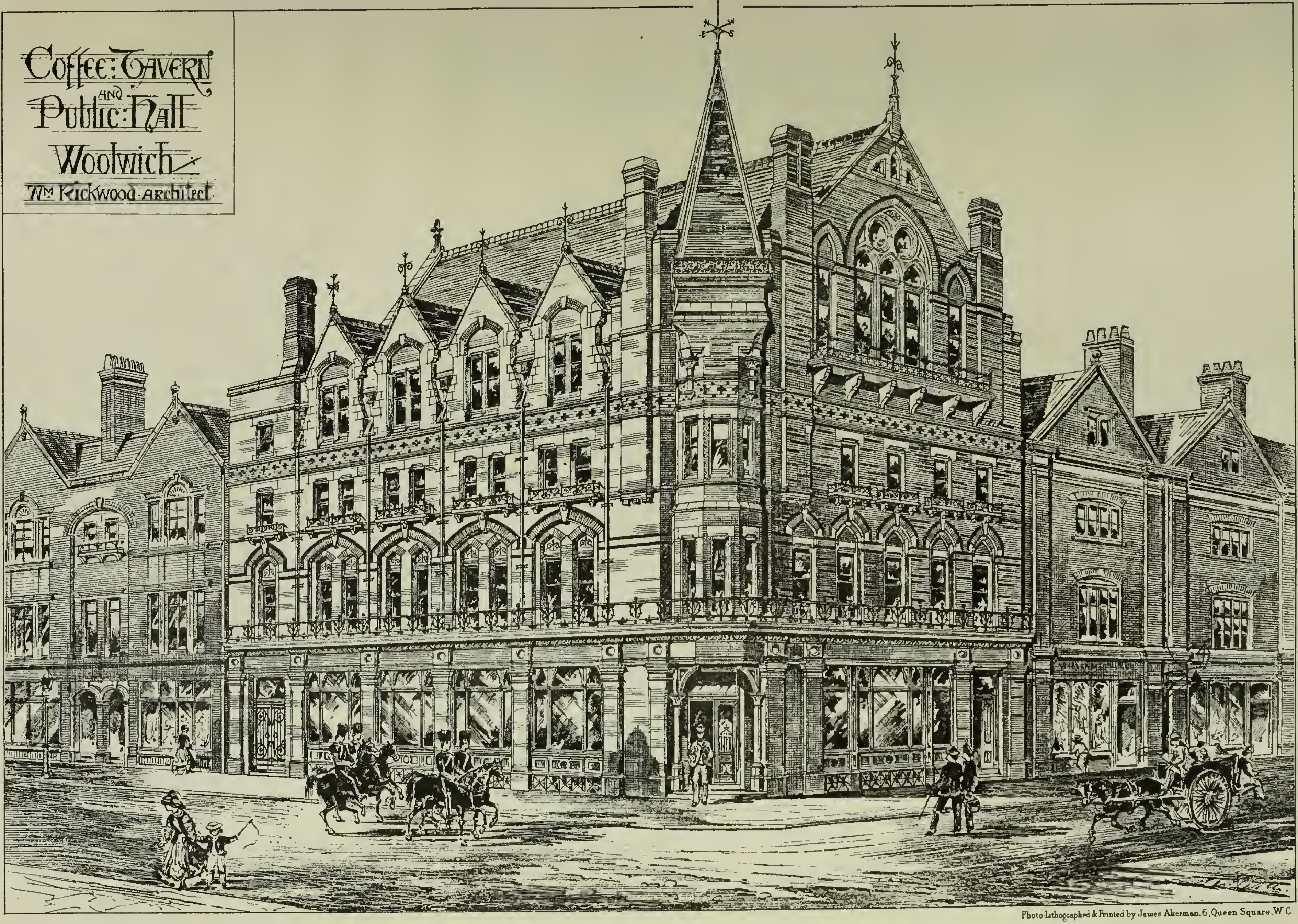




Ballycutter Church. Down. re-modelled.

Thomas Drew R.H.A.
Archt.
Dublin, August 1880

Photo-Lithographed & Printed by James Akerman. 6. Queen Square. W.C.



Coffee: Tavern and Public: Hall Woolwich

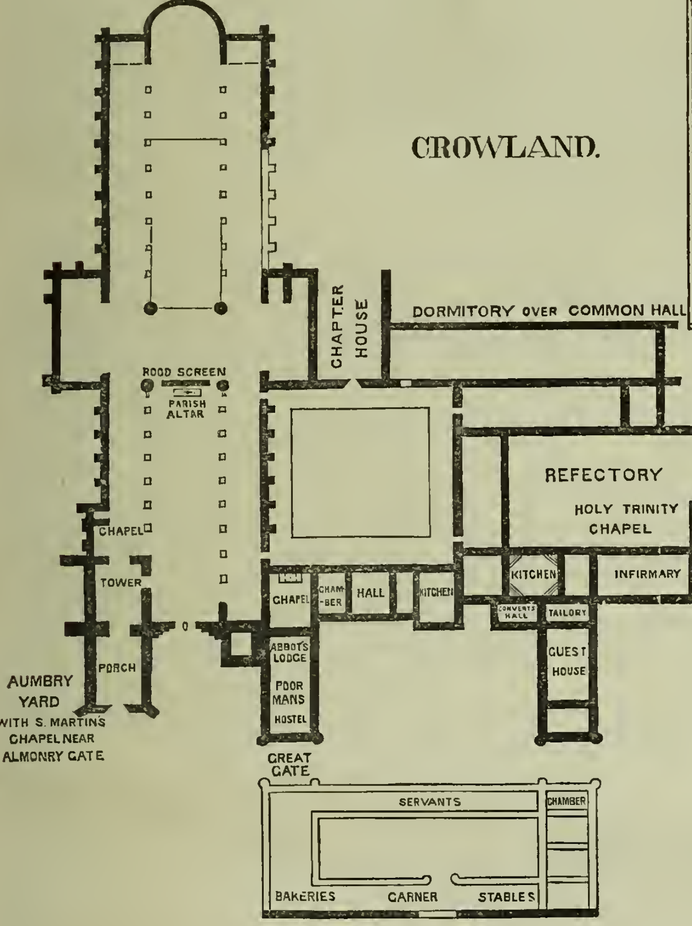
Wm Rickwood. Architect.

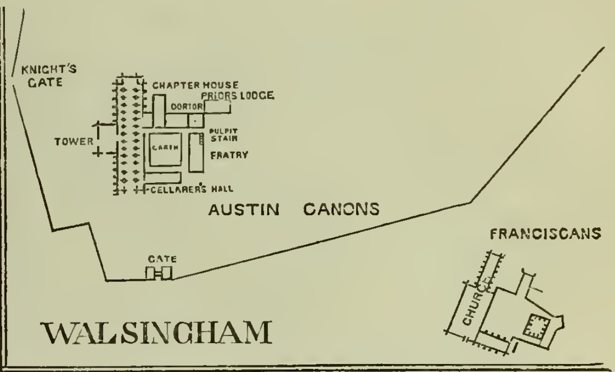
Photo Lithographed & Printed by James Akerman. 6, Queen Square, W.C.

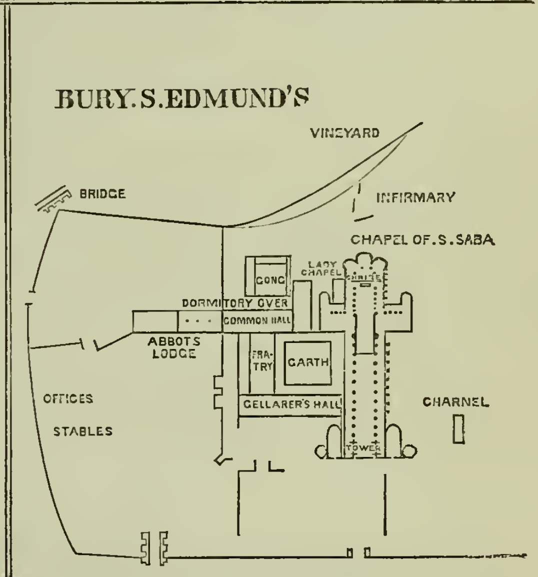
CHURCH NOTES ON AND OFF THE EAST COAST LINE.

(WITH THREE PLANS.)

COLCHESTER retains a considerable portion of the brick-built Priory of St. Botolph, which belonged to the Austin Canons. The soil has risen many feet deep round the bases of the piers. The west front is shorn of its gable and a large portion of one side; it is also in a deplorable condition of neglect and decay. A fragment of the south arcade, and six bays of that on the north side, with the aisle wall remain. The cloistral buildings and eastern arm have disappeared wholly. Traces only of the abutment of the Cellarer's hall are now perceptible. There was no triforium, but a very lofty clerestory gave dignity to the interior of the church.







The fine gateway and precinct wall, well-buttressed like that of Battle, are all that survive of the great Benedictine Abbey of St. John. Dates and other matters appear in my "English Minsters" (Chatto and Windus).

By taking the railway through Ipswich, and changing at Saxmundham, *Leiston* falls within a day's excursion. It was a Cluniac abbey; the ruins are included in a farmstead. The north arcade of the nave walled up, the transept, and eastern arm remain. The place of the sedilia is distinctly marked. In place of a north aisle there is a large lateral Lady-chapel. The east front has decorative flintwork, but the gable and upper part of the great window are gone. The whole of the conventual buildings are standing in a condition more or less perfect, but covered with weeds, wreck, and the very perceptible marks of the cattle and stock which are quartered to feed in them, and pasture in the garth and gardens. The brickwork "gloriette" of the abbot's lodge is slowly giving way to the influence of time and neglect. The abbey is about a mile from the village station.

Bury St. Edmund's, with its two grand gates and satellite churches of St. Mary and St. James, retains externally somewhat of its ancient grandeur. The west front is parcelled out into private dwellings; it must have been of great magnificence, and by comparing the remains with those of Peterborough, Lincoln, St. Alban's, and Ely, an approximate reconstruction of its appearance when complete may be made by a practised observer. It formed a gigantic screen, with three central portals, and a western tower; on either side a lower doorway opened into a large apsidal chapel, and was flanked by grand octagonal turrets. The ruins of the church are contained in private gardens, and every care is taken to preserve them; the walls of the north transept, several pillars, and a curved fragment of the apsidal chapel of St. Saba, used by the novices, at the extreme east end, remain. The Lady-chapel, as at Ely and Peterborough, lay parallel with the north choir aisle. The ruins of the conventual buildings (except the refectory) may be seen in the Botanic Gardens; they include disjointed portions of the eastern range of the claustral buildings, some detached buildings, the curious bridge leading to the vineyard, the dovecot, and the precinct wall on the north.

Thetford and Wymondham now become only too familiar stations to those who make Bury their centre and starting-point, using a wise discretion. The ruins of *Thetford*, a Cluniac abbey, lie in private grounds; the great gatehouse, portions of the court gate, and its adjacent buildings directly facing it, and broken portions of the church, which had a large lateral Lady-chapel, remain. The site is covered with mounds, hillocks, and a wild growth of thick herbage, with a waste of weeds.

Wymondham is always a splendid feature, close at hand or at a distance; the great west tower of the noble parochial nave, the octagonal story of the conventual lantern, once central, with its traces of porches, give an exterior dignity which, when duly cared for, must have been unequalled within. The sculptured font, the superb ceiling of the central avenue, one of only less beauty in the north aisle, the two doors of the rood-loft, and the remarkable sedilia, probably a Marian reconstruction, are portions which demand attention. There are traces of a transept wing, the slype and chapter-house, of which the mass of rubble work formed the core of the east window.

Through Thetford, by Swaffham, *Castle Acre* is reached, distant four miles. The gatehouse stands on the top of the hill, from which a rapid fall of the ground declines to the church. The rich west front, with the prior's lodgings adjoining it, gives a promise not redeemed within. The claustral arrangements may be clearly made out, as considerable portions are standing, but little more than fragments of the nave and transept have been left; a careful investigation of the ground, however, will enable the ecclesiologist to supply what is wanting.

By way of Wymondham, and the rail to Wells, Walsingham, shown only on Wednesdays, as it stands in private grounds, may be visited. The gatehouse is nearly perfect. The refectory, with its rich western window, and four bays of its southern arcade, with remains of the stairs and wall pulpit, is only inferior in interest to the superb east front, with side turrets, and the fragment of a glorious window, bearing a striking resemblance to Guisborough, with fragments of tracery clinging to the case. A partial disinterment of the west end of the nave inspires an ardent wish that a complete revelation of the whole plan should be made, even at the sacrifice of the trim lawns and pretty flower-beds which cover the site. It is the more desirable as it had a large lateral tower to the nave, which had only one parallel at St. Rhadegund's, Bradsole, near Dover, which belonged to the Regular Canons of Prémontre, while Walsingham was a house of their brethren under the rule of St. Augustin. The Franciscan Priory is roofless, but is a very complete example of its class.

Five miles distant is Binham, a Benedictine abbey. In sore neglect are sadly seen the fragments of a noble nave, the tracery of the west window represented by coarse brickwork, and the ancient fittings and decent furniture conspicuously absent within. The ground-plan of the remaining portions of the church, and the outline of the claustral buildings could be reproduced; and there are yet clearer evidences of a remarkable slype parallel to the south nave-wall. Portions of the gate-house remain. I regret to say that to the internal condition of this fine building, the well-founded observations on Wymondham which recently appeared in your columns are equally pertinent. I trust they will bear fruit; every true-hearted English Churchman must blush for such a disgraceful condition of things. Dale is equally dishonoured, and set off with an inscription to a noble earl as "lay-bishop" and a vulgar upholsterer's chair for his representative.

By the way of Norwich, Bromholme Abbey may be visited from North Walsham, from which it is distant five miles. The Gate-house frames the ruins which lie neglected in a farmstead. The north transept, the chapter-house, which was arcaded, and considerable portions of the dormitory over a common house, a fragment of the refectory, and parts of the south nave wall, will exercise the ingenuity of the re-constructor of the original ground-plan. The key, however, as in the case of other Norfolk minsters, may be found in the well-known work of Mr. Harrod, but for Walsingham I have had the advantage of using the exhaustive plan furnished by the Rev. James Lee Warner.

Lynn is rich in ancient houses, some with chevroned brickwork, carved doorways, cool entries showing a perspective of trim gardens full of flowers and bosky arbours. Thornley's College, the Red [Rood ?] Mount Chapel, St. Nicholas Church, the South Town-gate, and the Guildhall deserve notice; but the Benedictine church of St. Margaret has the prior claim on the traveller. Its western towers, the fragment of a vast Perpendicular north aisle (when the entire breadth of the nave was not less than 118ft.), and beautiful eastern end, with a Late rose window, reminding the eye of Durham and old St. Paul's, sixteen choir-stalls, parcloses, and splendid brasses, cannot fail to interest; but a doorway north of the altar may escape notice. Its history is peculiar. The Early English apse was removed and supplanted by an eastern platform over a short undercroft, approached by external doors, and also by an internal staircase through the triforium, and a gallery along the east wall, which communicated with the door which I have mentioned. There is a similar stage at Tunstal, near Norwich, and the object in both may have been for the representation of Miracle Plays.

The train to Spalding enables one to reach a point within eleven miles of Crowland Abbey. All the claustral buildings have disappeared. The vaulted north aisle of the nave, consisting of six bays with two lateral chantries, serves now as a parish-church; the place of the original altar is marked by two doorways in the rood-screen, which is richly panelled on its eastern face. It is interesting to observe similar ornament on the buttresses, of Perpendicular date, which were introduced to support the central tower, and the traces of the Norman arches of the triforium and base arcade, which in the eastern bay alone survived the rebuilding of that period. I have drawn attention at other times to the close resemblance borne by distant minsters to each other, like that which notably subsists between Durham and Norwich. But in no instance is there a nearer likeness than at Crowland and St. Alban's. Dr. Stukeley made a plan of the Lincolnshire abbey, which was published in a very limited issue by Mr. Gresley. It differs from another plan, which represents the infirmary with an arcaded hall, and chapel eastward of the chapter-house, and a bell-tower eastward of the great apse. The chapter-house appears to have been apsidal; but the learned antiquary has made it of extravagant size, which I have not ventured to reproduce. The church required some little correction on existing and traditional data; but the group of buildings on the west side of the cloister clears up a mass of difficulties which attended the identification of the MS. plans, and the description of the chroniclers all disappear in the clear light afforded by the testimony of Crowland.

The remains of the Grey Friars, *Lincoln*, deserve attention. The curious arrangement of aumbries in the choir transept-chamber of the Minster has no reference to a late archdeacon's theory of a medicine dispensary, but was connected with the muniments and building accompts.

Thornton Abbey is well known for its magnificent gatehouse, approached by a fortified bridge. The outlines of the church may be traced in a meadow, the south wing, with a window containing rich blind tracery, in part is standing, with an arcaded parlour, and portions of a vestibule as at Bolton, opening into a decagonal chapter-house, of which two sides of considerable architectural beauty remain, choked with an overgrowth of weeds and rubbish.

I was in hope of finding some clue to the declination of the double staircase in *Beverley* Minster among the Torre MSS. It can hardly have afforded access to a chapter-house; I think that it is more likely to have formed the approach to a great relic-chamber, as in many similar instances, the pilgrims ascending on one side and descending by the opposite stair. At an early date, thrice every year, the relics of St. John were carried in solemn procession through the town. I found, however, the arrangement of the stalls :—

North Side.	South Side.
Prebendary of St. Peter.	Archbishop, Preb. of St. Leonard.
,, ,, St. Catharine.	Preb. of St. Martin.
2 Parsons (clerks of Berefell).	,, St. Mary.
Hebdomadary.	Chancellor.
Preb. of St. James.	A Parson.
,, St. Michael.	The Archbishop's Vicar.
2 Parsons.	Hebdomadary.
Sacrist.	Preb. of St. Stephen.
2 Vicars.	,, St. Andrew.
	2 Parsons.
	2 Vicars
	Precentor.
	Prebendal Vicars.

The other vicars sat in front of their domini: and choristers in the third form. The prebendal titles were those of altars, there were also others dedicated to SS. Mary and Christopher. At an early date there was an oratory of St. Martin, for nuns, erected in the west end of the church; and the name of the Maiden's Tomb reaches back at least to 1609. The fridstool formerly stood on the south side of the altar, the inscription ran: "Hæc sedes lapidea fredstole dicitur, id est, Pacis cathedra, ad quam reus fugiendo perveniens omnimodam habet securitatem." The constitution was peculiar: the archbishop was president when present; there were three officers (the precentor, chancellor, and treasurer) and seven parsons, called of old time, berefellarii, clerks of the Berefeld in 1290, and Clerks de Berefell in 1337; the name, as it tickled waggish ears, was laid aside. The provost had no stall or voice in chapter, acting simply as the paymaster. I do not know whether it is generally known that the sedilia are of oak.

At Hawden the arrangement was :—

Preb. of Thorp.	Preb. of Barneby.
,, Saltmarsh.	,, Langton and Skelton.
Priest of St. Pancras.	Priest of St. Mary.
	,, St. Katharine.

Subsequently there was a Prebendary of Skipworth.

Guisborough Abbey is fortunate in its present owner, Admiral Chaloner, who has cleared the site, laying it down with a carpet of soft green turf. The ends of the aisles at the west front and several bases of pillars have also been exhumed, and the foundation of the rood-screen is laid bare. The turret-stair at the side of the splendid east front contains the missing portion of the Bruce tomb. The sides line the porch of the parish-church; the top forms the altar slab. The western part, figured in the "Monasticon," has been lost. The east end was recovered from a distant farm-house, and represents the Blessed Virgin holding the Bruce arms in the centre of a group of Austin canons, showing them in surplice and cope, and shaven—not with beards, as Dugdale has misled so many unsuspicious followers to believe. A fragment of the undercroft of the refectory, the roofless great gate-house, and the Poor Man's Hostel, built by Bishop Pursglove in the town, remain, with portions of the precinct wall, and a detached building. From the rental lent to me by Admiral Chaloner I find that the Prior had a town-house in York in "Aldewerk, near St. Helen's Church." Besides the usual altars of Holy Cross and St. Mary, there were others of St. Katharine and St. Thomas. The church measured 376ft., and the eastern gable is still 98ft. in height, the frame of the great window being 60 by 24ft. There were two gate-houses, through which the guests came to partake of the splendid hospitality which made the Priory a household word in Cleveland.

Southwell has one of its new timber spires erected; the fellow is ready framed. There remain six stone stalls, wood-lined and returned against the rood-screen. The effigy of Archbishop Sandys is vested in a chasuble. I cannot help a regret that, in view of the changes wrought in our cathedral system and their adaptation to modern requirements, the glorious parish-church of Newark, with its furniture complete—spacious, lofty, luminous, and placed in an important town—was not selected as the cathedral church of a new see, in preference to the minster which was sufficient for a collegiate establishment in a large village. The constitution was peculiar: it consisted of 16 prebendaries and 16 vicars in 1379; the latter were housed in a college, instead of in the Priestgate, at the east end of the minster, and, so late as 27 Eliz., they were required to sit at the residentiary's table or board in some honest house. In 1172 chrism was brought from York to the rural deans assembled in synod, and distributed. All the clergy and faithful of Notts came in procession at Whitsuntide, and the Pentecostal offerings, or deniers, in 1460 were paid at the high altar. The altars were those of SS. John Evangelist, Peter, Cuthbert, Nicholas, Thomas M. in the new work; Mary Magdalen, Stephen, Vincent, and John B. on the south side of the nave, built by Archbishop Booth as his burial-place;

Laurence and Margaret, adjoining the "Pyte," St. Mary, in her sorrow.

Selby is greatly improved by the removal of the hideous wall which parted off the choir, and the replacement of the remaining stall work. Some stone parcloses are awaiting re-erection. Glorious Rievaulx and Byland are simply uncared for; the latter is in a slough: both are cumbered with masses of ruin. Why have not Kirkstall and Fountains roofs? I have no sympathy with sentimentality, or art-worship. Welcome the day which will make them again peopled houses of God. We have, alas! ruins enough for architectural students, and, happily, some "unrestored" churches. I have heard words which would make the ears of possessors of such sites tingle; would they could penetrate so far, and hasten the auspicious day which will preserve religiously all that is sacred to history and art, even if they are not to be given back to their original destination.

I have carefully abstained from giving any cuttings from my "English Minsters"; and in the case of Norfolk, the excellent account given by your correspondent of the progress of the Architectural Association, has rendered any further detail quite superfluous. Gainsborough trenches on Domestic architecture; but I would urge travellers to visit the singularly picturesque old Hall.

MACKENZIE E. C. WALCOTT.

CHIPS.

A new coffee-tavern at New Elvet, in the city of Durham, was opened on Thursday week. Adjoining the refreshment-room is a coffee and newsroom, 45ft. by 13ft. wide, and on the first floor is a meeting-hall, 60ft. by 13ft. Mr. Henry Robson, builder, of Durham, was the contractor.

A new meat, fruit, and dairy market was opened at Sunderland on Friday. It is close to the central station, and is built of red bricks, with cornices, mouldings, and dressings run in cement. The principal dimensions are 97ft. by 66ft., 16ft. high to wall-plate, and 31ft. to apex of roof. Messrs. J. and T. Tiltman, of Sunderland, were the architects, and the contractor for brickwork and joinery was Mr. Mark Howarth, of the same town.

A provincial lecturer says, the entire area of the metropolis is rated at £24,500,000, while Liverpool is only rated at less than one-twelfth of that amount. The water space of the London docks covers 540 acres, while that of Liverpool covers 483 acres. There are in London no less than 15,000 professional thieves living in 235 houses known to the authorities; and the police force numbers 12,000 men. In the 8,000 streets of London, measuring 2,800 miles in length, there are 5,000 public houses, or as many as would cover both sides of the road from Birkenhead to Chester.

The Holborn board of guardians on Friday approved of a site at Upton, Essex, on which they will hereafter build an additional workhouse, accommodating 1,800 inmates. Mr. H. Saxon Snell is the architect.

Mr. R. P. Bell and Mr. George Aikman were elected on Friday associates of the Royal Scottish Academy.

At a vestry meeting held at Hove, next Brighton, last week, it was unanimously resolved to reseat the parish-church, purchase a new organ, and in other ways to restore the building.

Canon Gregory appeals to the public to raise funds for a new and "a really big bell" for St. Paul's Cathedral.

The Metropolitan Board of Works on Friday received a deputation of Islington tradesmen, who petitioned the board to obtain power to widen Upper-street, Islington, which was stated to be dangerously narrow, and the scene of frequent accidents. The deputation were informed that the board had decided not to apply for Parliamentary powers next session to make this improvement. It was determined, on the ground of expense, not to accede to memorials from Fulham and Putney that the new Putney bridge be made 50ft. wide, but to adhere to the engineer's plan, 44ft.; nor to seek powers to widen the approaches on the Surrey side. The board decided to send circulars to the so-called "delegates" of local boards and vestries who recently communicated with the Home Secretary as to the water supply of the metropolis, in order to ascertain if they were authorised to take the action they did.

Building Intelligence.

BIGRIGG.—A chapel of ease to Egremont Church was consecrated by the Bishop of Carlisle on Tuesday week. It is of Decorated Gothic character, and is built of the red sandstone of the neighbourhood. It consists of nave, 62ft. 6in. long by 25ft. wide; chancel, 20ft. wide and 30ft. long, with vestry and entrance-porch on the south side. A system of harmonic proportion has been adopted in the planning and arrangement. 250 sittings are provided. The organ is of the Scudamore type, and was built by Mr. Willis; the case is of teak, specially designed by the architect. The chancel seats are of the same wood, and were carved by Mr. Davidson, of Carlisle. The reredos hangings were by Messrs. Morris and Co., London. Mr. Charles J. Ferguson, F.S.A., of Carlisle, was the architect; Mr. Smith, of Egremont, the builder, and the stone carving was executed by Mr. Nelson, of Carlisle. The total cost has been £2,300. We illustrated the building about 12 months since.

GUNNISLAKE.—The new church of St. Anne, at Gunnislake, near Caldstock, was opened on Tuesday week by the Bishop of Truro. It is Early English in style, and consists of nave, chancel, north and south aisles, and entrance porch, over which a tower will hereafter be erected. The nave measures 83ft. by 43ft., and seats 300 persons. A novel feature in the construction is the gradual lowering of the floor towards the chancel, which is again elevated. Beneath the church are clergy and choir vestries, each 20ft. by 15ft. The pulpit, open benches, choir seats, and open roof to nave are of pitch pine, and the roofs are covered with Delabole slates. On south side of chancel sedilia and piscina are provided. The steps and base of pulpit and the font are of granite, from the Phœnix works. The lighting is by cathedral-glass, supplied by Messrs. Fouracres, of Stonehouse, next Plymouth. Heating is by Remington's apparatus, pipes being laid in the aisles. The cost has been £2,000. Mr. J. Piers St. Aubyn was the architect, and Mr. Rosekilly the contractor.

KILLEARN.—On Saturday the memorial-stone was laid of a new parish-church at Killearn. The edifice, which is designed by Mr. John Bryce, F.R.I.B.A., Edinburgh, is in the early type of English Gothic, and is cruciform in shape, the arms of the cross being formed by the transepts, while at the south-east corner rises a tower with spire, 100ft. in height from the ground to the vane. It will accommodate about 600 sitters, and will cost between £5,000 and £6,000.

NEEDHAM MARKET.—The chapel-of-ease of St. John, in the small Suffolk town of Needham Market, was reopened on Friday after restoration. The building was re-erected during the episcopate time of Dr. Carey, 26th Bishop of Ely, who died in 1478, and consists of a nave and chancel, which prior to the restoration, were not to be distinguished from each other, and the building was then in a dangerously dilapidated condition. The new pulpit is of carved oak, with open panel-work sides, and the lectern is also of oak, and the new font of Bath stone. The chancel roof was in so unsound a condition that its complete removal was found to be necessary; it has been replaced by another like the old one, which was of simple construction. The great feature of the restoration has been the opening up of the handsome nave roof, formerly hidden by the white-washed ceiling, but now exposed. This roof is almost unique in construction, the rafters not being carried up to the apex, as is usual in a hammer-beam roof, but being framed into the upright struts, which carry the higher part of the roof, and support on the south side a timber-built clerestory. The deep cornice, which had been removed when the plaster ceiling was put up, has been replaced, and most of the hammer-beams have required renewal, the junctions of the hammer-beams with the lower part of the struts having been cut away; but the details which were remaining have been followed, and the richly-moulded tie-beams which span the church have been preserved. The clerestory on the south side has been restored, and windows have been placed on the north side also, where there was before no clerestory. The work has been carried out by Mr. R. Tooley, Bury St. Edmund's, from plans of the late Mr. J. H. Hakewill.

PETERBOROUGH.—A new Sunday-school, in connection with Trinity Congregational church, was opened on the 2nd inst. The building accommodates about 500 children. The exterior is built of Whittlesey mingled bricks, relieved with dressings of Bath stone and moulded bricks. The interior of schoolroom is finished in white brick, with a few red bricks introduced in arches and bands; the roof is ceiled at the collar; the main trusses are of pitch-pine, exposed to view, and have bold curved ribs springing from Bath stone corbels. The contract was undertaken for £1,152 by Messrs. Gray Brothers, of Peterborough. The work has been carried out from the designs of Mr. Hampden W. Pratt, architect, of 3, Long-acre, London.

PUDSEY.—A new Mechanics' Institute, at Pudsey, was opened on Wednesday week. The style is Gothic, and one of the principal features is a signal-tower placed at the corner of the two chief points, which rises to a height of 110ft. On the basement floor is a large room 43ft. by 24ft. On the Low Town-road side three class-rooms, each of them 13ft. 8in. by 16ft. 3in., a larger class-room, 23ft. by 13ft. 8in., and a large lavatory. The accommodation on the ground-floor consists of a spacious reading-room 30ft. by 24ft., a library 29ft. by 16ft., a committee-room 23ft. by 13ft. 8in., a secretary's room 16ft. 3in. by 13ft. 8in., and three class-rooms similar in size to those on the basement. On the first floor is the public hall, which is 56ft. by 40ft., and is capable of seating about 700 persons. There is also a smaller lecture-hall, to be used for science lectures, &c., capable of accommodating 150 students. The contracts amount to about £3,200, and the building has been erected under the the superintendence of the architects, Messrs. Hope and Jardine, of Bradfort, whose plans were selected in open competition.

PUDDLETRENTHIDE, DORSET.—The parish-church of Puddletrenthide was reopened on Monday week after complete restoration of the chancel, carried out by Messrs. Wellspring and Son, of Dorchester, from the plans of Mr. Ewan Christian, architect to the Ecclesiastical Commissioners. The floor, which was formerly paved with stone, is now laid with Minton's encaustic tiles; and a new barrel-boarded roof has been erected, having moulded ribs, with carved emblematical devices on the intersections. A feature of the work was the removal of a huge marble and stone monument, which formerly blocked a south window of the chancel, to the opposite side, where it is seen under an advantageous light. The monument is to the memory of Mr. John Budge, a City merchant, and a native of this parish, who died in 1834, and cost 700 guineas; the design was by Cockerell, and the statuary by Nichols; the removal has been effected without causing a crack in the work.

RETFORD.—Last week the Wesleyans of Retford opened a new chapel at that place. The contract for the building was £4,850. The pews in the chapel are on the semi-amphitheatre form, with a slight incline, with passages radiating from the Communion platform. The total accommodation for ordinary services is 900. The ceiling is formed into deeply-moulded and enriched caissons or ribs, the panels of which are decorated with a pierced ornamental guilloche, serving for ventilation, extending down the walls and springing from foliated corbels. The exterior is executed in Bath stone and red brick in the Lombardic style, and comprises a central entrance with a four-light window over, surmounted by a cantalivered gable, supported by piers and buttress. To the right and left are the secondary entrances forming wings. The work has been carried out by Mr. Thomas Hopkinson, contractor, of Retford, from the drawings and under the superintendence of Messrs. Bellamy and Hardy, of Lincoln, who were also the architects of the Retford Town Hall.

SPALDING.—The new church of St. Paul, Spalding, was consecrated on Wednesday week. It is built from the designs of the late Sir Gilbert Scott, R.A., and is in style a pure treatment of Early English. It consists of a nave, with north and south aisles; the south aisle being continued to midway of the chancel. At the west end of the nave, and connected with it by a corridor, is a tower with broach spire, rising to the height of 135ft; it contains a peal of eight bells, cast by Mr. Lewis, of Brixton, the tenor weighing 16cwt. The bells bear each a significant inscription. On north side of chancel is the priest's vestry, and over that an organ gallery; adjoining is a choir vestry, and below a heating-chamber. A door from this vestry leads to offices belonging to the church, and into the vicar's garden; also by a covered cloister to the school, which is effectually shut off from access to the church, when desired, by a grill gate. The materials are red brick, with Ancaster stone dressings. The whole of the high-pitched roofs—nave, chancel, aisles, and porch—are covered with lead. The internal treatment of the main arcade of nave is peculiar; it is supported on each side on three principal piers by detached columns carrying the three semicircular arches, which are each divided into two pointed arches, springing from more slender columns between the main piers. The altar is raised seven steps above the floor-level of the nave, the steps within the sacrarium being grey fossil marble, polished. The stalls and screens are of carved English oak, massive. The sedilia and piscina are hooded, and recessed in the thickness of the south wall. The font is in Mansfield Woodhouse stone, with Purbeck-marble shafts. The whole of the church building is elevated about 3ft. above the ground level, and is carried throughout upon Dennett's arching. It is thoroughly ventilated underneath. The ironwork of the chancel screen is by Skidmore, of Meriden, Coventry, as are also the gas standards in the nave and the pulpit rail. The pulpit, in carved oak, on a stone base, is by Farmer and Brindley, Westminster, and also the carved work in the chancel. The church, vicarage, and school, form three sides of a quadrangle, which is the vicarage garden. Gas is introduced into all the buildings. The church will accommodate 500 worshippers. The whole of the works have been carried out by Messrs. Pattinson, contractors, Ruskington, under the supervision of Mr. Scott, as architect, and Mr. Hannaford, as clerk of the works.

Tolleshunt D'Arcy.—The parish-church of Tolleshunt D'Arcy, near Maldon, Essex, was reopened on Sunday week, after having been restored. The old high pews have been replaced by pitch-pine benches throughout the church, these being supplemented in the chancel by choir-stalls, also of pitch-pine; the halls throughout have been painted and decorated; the chancel and passages have been laid with Minton's tiles in black, red, and yellow; heating apparatus introduced; a new prayer-desk and pulpit in carved oak replace higher and larger old ones, and a lectern has been added to the furniture. The east window has been filled with stained glass as a memorial; the central subject is Our Lord's Sermon on the Mount; on the left hand is the Healing at the Pool of Bethesda, and on the right Jesus Blessing Little Children. Mr. A. Gibbs was the artist. The works have been carried out by Messrs. Gardner and Son, contractors, of Coggeshall, from plans by Mr. H. W. Hayward, of Colchester.

Warrington.—New offices for the *Warrington Guardian*, opposite the town-hall, were opened by Lord Winmarleigh on Saturday. The building is designed in the Gothic style. The fronts are of red pressed brick, with terra-cotta dressing and stone window-sills. A deeply-recessed centre doorway forms the principal entrance in Sankey-street, with a moulded arch supported on polished red granite columns, having carved caps and moulded bases. The entrance to the works is in Springfield-street, and has been elaborately treated with terra-cotta corbels, key-stone, and moulded tympanum. The building consists of a publishing office 30ft. by 24ft., an office for advertisements 60ft. by 30ft., divided off by dwarf glazed screen partitions into public office 30ft. by 28ft.; private offices 32ft. by 39ft.; sub-editor's office and reporters' room, 36ft. by 29ft. These rooms are 30ft. high, with open-timbered roof of pitch-pine, with framed Queen-post principals. The offices are heated by open fireplaces, a large Musgrave's stove, and steam-pipes. Spacious cellarage has been provided below for general stores, with lavatories, w.c.'s, and strong room. At the back is the large printing-room to be used as the works, which measures 126ft. in length by 94ft. wide in the clear of walls, and is divided into three spans by means of two rows of cast-iron columns. The room is lighted by side windows, skylights, and continuous lantern lights. Ventilation will be by vertical flues and outlets, and by Hill and Hey's patent siphon ventilators. At the corner of Springfield-street will be a publishing office, with doorway at angle. At the extreme end of premises are a damping-room, paper store, foundry, boiler-house, lavatories, w.c.'s, &c. The whole of the terra-cotta, executed from the architect's designs, has been supplied by the Knutsford Terra-Cotta Company. The granite columns are from Messrs. MacDonald, Field, and Co., Aberdeen. The carving was executed by Essenheigh. Messrs. Collin and Son are the contractors, and Messrs. A. Williams and J. Ratcliffe have acted as clerk of the works. The work has been executed from the designs and under the superintendence of Mr. T. Beesley, of Warrington.

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Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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W. W. (Best bedrooms in the description may mean only one to each of the four houses, but the plans and specifications would rule in any case Under the clause you are bound to carry out the architect's intention.)—G. B. (We think the committee would have the right to keep all the premiated drawings under the conditions.)—Commission. (No, but few architects would cultivate such relations, because they could not honestly afford such remuneration.)—Y. ("The Carpenter and Joiner's Assistant," Blackie and Co.)—A. G. Scott. (You had better write to the secretary. We know very little about these examinations.)—Architect. (Gwilt's is as good as any.)—Toby. (Claridge's will suit you every way. It is especially adapted for roofs and terraces.)—A. A. (Write the Secretary of the Society of Arts, John-street, Adelphi, W.C.)

"BUILDING NEWS" DESIGNING CLUB.

LIST OF SUBJECTS.

A. A chapel to a public school, to accommodate 120, in the Late Gothic style, gallery at the west end, altar to be raised 7 steps. Plan, two elevations, and sketch. Drawings to be ⅛th of inch to foot.

B. A cabinet for books and china, in oak or walnut. Size, 6ft. × 4ft. Elevation and sketch. Inch scale, with details.

Received.—Ralph, Kismet, X. N., Tom Tit, A. L. Husband.

Drawings Received.—J. L., Fiat, Maltese Cross. Hornet, Little Wooden Soldier, Puck, Darney, Earnest, Jack, Milverton. (Put your drawings outside the roller, not pasted inside. We had the greatest difficulty in cutting the drawing out.) Tyke, Snowflake, Nam, York, Idea, Gilbertus, Kismet, Subjudice, G. W. W., Hubert, Arnold, X. N., H. F., Ephraim, B. J., Peter, Rex, Boy Bill, Domus, Will, Vignette, R. in circle, Motto A., Ralph, Reginald, Beta, "Con" in circle.

Correspondence.

HOUSE-DRAINS AND THEIR RECORD.

To the Editor of the Building News.

Sir,—At p. 497 of your issue for October 29, and under the above heading, you refer to the sizes of drain-pipes. For houses these sizes are generally 4in., 6in., and 9in. diameter. I coincide with the idea that the latter size is generally unnecessary, and often used where a smaller size would make a better job. I do not care for 4in. drain-pipes for dirty water, as from sinks, &c., especially if the distance is in yards. Instead of 4in., 6in., and 9in., I think 5in., 6in., and 7in. pipes would be better, 4in. being only used for short lengths, as for pipes coming through walls, say into traps and such like, as from sinks and baths, and for rain-water.

I happen to be sorting the drains for a gentleman's new house just now, standing in its own grounds; the house has been about three years occupied; a 4in. drain-pipe about 27ft. long came from the sink, and joined into a 6in. pipe. The latter was quite clear, but the 4in. one was choked up nearly solid, although it had a fall of about 2in. to the yard. I took it out and put in a 6in. pipe instead, and also a trap outside.

In many houses the drain-pipe from the sink is far worse to keep clean than the water-closet drain.

As to plans of drains, many people will not take the trouble to keep them, but more interest is being taken of late than formerly. In the new style of ventilated and trapped drainage the position of the gratings and lids helps to tell the position of the drains, and by looking down into the traps the depth of the drain is seen, and also with a good trap some knowledge of its state can be got. This is a great improvement upon the old mode of hiding everything in the Lord Lovel style. The great point to secure good house drainage is good authoritative supervision when the house is building. In connection with a fashionable range of buildings erecting not a hundred miles from Glasgow, my own name was put into some of the agreements as referee, but I was to be tied down only to report upon the "workmanship," and to have no business with the plans. I took the liberty, however, upon examination, to condemn the plans, which showed the drains leading through the house without any good excuse for doing so, more especially as I found them leaking even before the work was finished. I was told I had nothing to do with the plans, whether they were good or bad, so, having no authority, I could do nothing; but this incident is one among many pointing to the necessity for an alteration in the law. A showy front is the principal thing that speculative builders care for, and even the public or the purchasers require to be protected from themselves. Their servants also require protection, and it is just possible that nowadays were a female servant to get diphtheria or typhoid fever in her master's house, and the doctor was able to certify that it was the bad state of the drains that caused her to get the disease, then she might have good grounds for an action of damages, or, if she died, her parents might take the case up. A hundred pounds' damages granted in a case of this sort would have a wonderful effect in stimulating improvements in house-drainage.—I am, &c.,

W. P. Buchan, Sanitary Engineer.

TRAPLESS DRAINS AND WATER-CLOSETS.

Sir,—Having made a particular study of house sanitation for many years, and after trying innumerable experiments, I cannot let the correspondence now going on pass without a few remarks. In the first place, I do not agree with those writers who advocate the non-trapping system, because a trap, although not perfect, really does prevent the passage of sewer gases to a great extent, though it should not be entirely depended upon, but should be assisted by ventilating shafts which relieve the traps from any undue pressure. The suggestions of Mr. W. B. Kinsey come the nearest to my practice; but instead of the siphon traps, he mentions a gulley trap with means of access over it at the surface, which is much better. The siphon traps, so-called, are a complete nuisance, always liable to be choked.

I have removed numbers of them. At inlets to drains, traps of S-form may be used, which clear themselves much better; no more useful trap can be used for foot of soil-pipe than "Buchan's." With this trap and a ventilated soil-pipe, avoiding that abominable article the "Pan Closet," it is impossible to have anything deleterious pass into the house. The plug-valve closet I have frequently seen, both in and out of repair, but have never used it, and I consider it liable to all the objections mentioned by your correspondents; nothing can possibly be so clean and efficient as the S-trap, with proper ventilation above the base of building. On several occasions within the last year or two, I have had to connect house-drains with sewers, and the workmen have complained of the nauseous effluvium which followed them as they put in the drain; but it did not occur to them, until they were directed, to fill up the intercepting trap with water; when that was done, everything objectionable was at once remedied, and when examined from time to time, no offensive smell could be perceived. I know many instances, in spite of stringent by-laws, where the house-drains are nothing less than conductors for passing sewer gases into the houses. The ventilation and trapping of house-drains should be strictly investigated by the authorities, and the ventilation of sewers, still imperfectly done, should be effected by them and not by the owners of property.

Eastwood, Notts. S. J. Barber, C.E.

OUR RAILWAY BRIDGES AND IRON STRUCTURES.

Sir,—Your contributor in the Building News of the 29th ultimo, gave a very correct account of what is going on among our railway bridges, and was most careful in avoiding any direct mention of particular systems; in this he was unlike your correspondent of last week upon the same subject, which brought forth a reply from the engineer of the line mentioned. He no doubt knew to which bridge on the North Staffordshire Railway he referred, and Mr. Stubbs may be congratulated on the way he answered the complaint. At the same time, however, there is a doubt (at least in my mind) as to whether, if the matter were further gone into, the complaint made would be found to be correct.

As an engineer of over 20 years' experience, particularly in the class of work under consideration, I think I may be allowed to express an opinion upon our railway bridges and iron structures generally, not only from a technical point of view, but from actual practice; and, were it not for taking up too much of your valuable space, I might fill columns with actual tests of both new and old works on some of the largest railway systems in England.

There is not the serious necessity for the thorough examination of iron work generally as there is for the *under* bridges which have been constructed for at least a quarter of a century; these are the great source of danger to the travelling public, who have some idea of their existence, but not of the very extraordinary extra duty imposed upon them in their capacity as structures for carrying a rolling load. I know of hundreds of bridges of this class, principally of wrought and cast iron, and also some of timber, which have been in use for this term of years, and which have had no additional strength given them, and if any paint at all, in such sparing quantities, and of the very vilest description, as to be almost useless—in fact, the first shower of rain washes it off. I may here state, as an example of this, that some time ago I had a contract for painting to let for one of our largest railway companies, such contract to be carried out with the best materials and workmanship, and to have three coats. The whole of the work was in iron lattice bridges and iron roofs, requiring a large quantity of scaffolding. Although I protested against the acceptance of the tender, which I maintained was ridiculously too low, and which I insisted could not be carried out, yet the directors accepted a tender of 2½d. per superficial yard for the completion of this work.

I need hardly say that the work was (notwithstanding the great extra supervision) wretchedly done, and would have been better not done at all, for the rubbish put on ran off as quickly as applied. Great care was also exercised that the white lead was what was required; but with all this the work was scamped, and the contractor failed to complete it. In a case of this kind, I think the directors are very much to blame for wishing a contractor to do what they know to be an impossibility, or, not being able to judge themselves, at least might have taken the advice of their engineer.

This is the class of paint which is commonly used on railway bridges when they get a coat of paint; but I have known them go for seven or eight years, or even ten years, without even this.

Is it to be wondered, then, that there should be a feeling of alarm spreading among the travelling public? and is it not surprising that engineers, who are aware of those things, and the consequences of such overstraining and neglect, should allow the parsimony and constructional ignorance of railway directors (I once heard one, now chairman of a large company, say that he did not understand a plan, in fact, did not know the top from the bottom) to interfere with the carrying out of what is their duty to the public, and which ought to be insisted upon by the Board of Trade.

Locomotive superintendents, no doubt, are compelled, owing to the extra demand laid upon them by the increased railway traffic of the country, to make their locomotives of such additional weight as to give the necessary adhesive power, enabling them to carry the extra tonnage required of them. Owing to this (as your correspondent states), re-metalling the road is constantly going on. It is not only re-metalling, however, for the engineers consider it necessary to have not only an increased sectional area of rails and chairs, but also to have the former of steel, giving nearly 50 per cent. greater strength in a bearing of about 3ft., or the distance between the sleepers.

If it is necessary to give this increased strength in a span of 3ft., how much more so must it be in spans of much larger dimensions, say, from 20ft. to 60ft. (*Vide* my report to the Board of Trade in July last.)

These bridges have, as above mentioned, been constructed for a quarter of a century, and at the time of their construction were made four and a quarter times the strength required for the greatest load then passing over them. Note what follows. Deterioration goes on, wear and tear, oxidation, elongation of the fibre, or detachment of the grain, caused by the continuous strain, generally equal to a blow on the structure, and, more serious than all the rest, the locomotives are made nearly twice as heavy as those calculated for in the first instance, viz., 80 tons, instead of 40 or 45 tons, thus increasing the rolling load nearly 100 per cent., and, consequently, reducing the strength of the bridge 50 per cent.

It does not, I think, require an engineer to see that these bridges are reduced from four and a quarter times their breaking-weight, or greatest load put on them, to about one and a half times, thus showing that, with 50 per cent. more load on them, entire failure would be the result. The very smallest amount of marginal safety is here, and this, even, may be still further reduced by some little defect in the construction of the girders.

There is, however, some little satisfaction in that the quality of the materials used in these old bridges is much superior to that now used in our structures, 28 and even 30 tons per square inch being the amount which the wrought iron would stand then, whereas now it is a difficult matter to get more than 17 or 18 tons in iron generally used for bridge construction.

I am afraid I am trespassing too much on your space; but I will just briefly state that, some time ago, in preparing the ironwork of a goods-warehouse floor, in Manchester, for painting (it had been constructed three years and a half, and all completely painted), I had scraped off three-quarters of a hundredweight per square of oxide of iron in corrosion only.

I shall be glad to go further into this matter at another time, but I think this may probably draw the attention of the authorities on our railway systems to these serious matters, and which attention may be exercised in a direction soothing to the nerves of the general travelling public and of—Yours, &c.,

W. Graham Lees, C.E.

180, Radford-road, New Basford, Notts.

BURTON MARKET-HALL COMPETITION.

Sir,—Can any of your readers inform me what is being done in connection with the above. The drawings were sent in, I think, last July, and never a word has been heard of them since, or even of the guinea that was charged for particulars.—I am, &c., B.

THE R. I. B. A.

Sir,—I cannot help thinking that some of the recent changes made by the Council of the Royal Institute of British Architects are very unwise—for one, that of issuing the Transactions in one volume at the close of the session; another, that of devoting several evenings to routine business. The meeting rooms of the R. I. B. A. are in a very inconvenient position, being a very long distance from any railway station, and it can hardly be expected that members residing in the suburbs will take the trouble to go to Conduit-street for the purpose of hearing a discussion on business, or the election of members.

One portion of the President's inaugural address required correction, or qualification, as it certainly appears that the President advises that charges are to be based upon "the get-what-you-can principle," instead of the 5 per cent. charge. If the authorities of the society really mean this, there is nothing now to prevent a Fellow or Associate from tendering his services for any job with builders' clerks, house agents, &c. I know many instances in which members of the Institute have refused to compete for, or take work for 2½ or 3 per cent., and if by the new regulation a number of country members are secured (it is in the provinces that the low commission system abounds), all I can say is, let such men be kept out of the society, and its old dignity and status preserved.—I am, &c., Associate.

CHIPS.

Mr. James Fowler, F.R.I.B.A., architect, of Louth, Lincolnshire, has, within the last few days, been elected mayor of that town. Mr. Fowler held the same office for two consecutive years on a former occasion.

A course of Cantor Lectures is about to be delivered before the Society of Arts by Prof. Church, F.C.S., on "Some Points of Contact between the Scientific and Artistic Aspect of Pottery and Porcelain." The course will consist of five lectures, the first of which will be given on Monday evening next at 8 p.m., and the remaining lectures on subsequent Monday evenings at the same hour.

An exhaustive report as to the paving of "New Streets" was prepared by the Parliamentary committee of the Hackney Vestry last summer, and appeared in full in the Building News of July 16th (p. 58 of present Vol). This report, which condemned the past action of the District Board of Works in paving certain "new streets" out of the public rates, and advocated that those rates should be recouped from the money so expended, came before the latter board on Wednesday week, and provoked an animated discussion. It was moved that the report be only received, inasmuch as for the members to adopt it would be self-condemnatory; but it was eventually agreed to refer it to the general purposes committee.

At Salisbury, on Monday, new Sunday-school buildings, erected at the rear of the United Methodist Free Church in Milford-street, were formally opened. The buildings consist of a central hall 48ft. by 26ft., with class-rooms, infants' room, cloak-rooms, and lavatories opening off on three sides, accommodation being provided for 350 children. The forms, tables, chairs, and other fittings were specially designed by the architect, Mr. John Wills, of Derby. The style of the building is Italian, in harmony with the proposed reconstructed chapel. Messrs. E. Young and Sons, of Gigant-street, Salisbury, were the builders, and the cost has been £1,400.

A new children's home, at Barclay-road, Walthamstow, was opened by the Bishop of London last week. Mr. Bressey was the architect, and Mr. Arber the builder of the premises.

Mr. Hubert Herkomer, A.R.A., on Tuesday night, distributed the prizes to students at the Leicester School of Art, and afterwards delivered an address.

The town council of Chard, Somersetshire, adopted, last week, plans prepared by Mr. Whittaker, their engineer, for the drainage and water supply of the borough and parish. The estimated cost of the work is £5,422, and three-fifths of the outlay will be within the borough limits.

Mr. Down, senior partner in the firm of Down and Son, architects and surveyors, Bridgwater, died at his residence, at Eastover, Somerset, on Wednesday week. The deceased gentleman was an Alderman of the borough, and also a member of the School Board.

Intercommunication.

QUESTIONS.

[6294.]—**Discoloured Scales.**—My ivory scales are slightly discoloured. By what means can they be restored to their original whiteness?—Ivory.

[6295.]—**Joists on Girder.**—Will some practical reader tell me the best way to support the ends of joists on the lower flange of an iron girder projecting only about 2in.?—Curious.

[6296.]—**Damp Walls.**—Two years ago a house was plastered on old walls. Nine months ago, in same, the two sitting-rooms and staircase were painted four coats in oil. The paint now is discoloured and wet to the bottom, in patches; other portions are quite nice. Can any of your readers assign a reason?—Decorator.

[6297.]—**Building Estate Charges.**—A surveyor wishes to know from some of the experienced readers of the Building News, what the usual charges are for surveying and laying out a building estate, preparing plans, letting lots, and setting out same, the ground rents being from 40s. to 50s. per lot. What fees are usually paid by the builder, and what charges should be made to the owner of the land?—Hinion.

[6298.]—**Party Wall.**—A. and B. are owners of adjoining dwelling houses in London, and A. pulls down his house, rebuilding it, raising on the party-wall about 6ft. without giving notice to B., as required by the Building Act. B. has applied to his solicitor, and an eminent barrister gives an opinion that B. has no remedy against A. beyond the extent of actual damage, consisting of a ceiling slightly injured by wet. As the Building Act contains a number of clauses about the building owner giving notice, it is rather odd that nothing is mentioned as to the adjoining owner's remedy if such notice is not given.—Surveyor.

[6299.]—**Felt on Church Roof.**—I am getting a church rebuilt with an open-timbered roof and diagonal boarding on backs of rafters. On top of the boarding I am putting a coating of felt under the slates. Another architect is getting a church built in a neighbouring parish, and the clergyman of that parish seeing the felt on my roof, wished to have his church done in a similar manner. This his architect refused to do and condemned the use of felt, and alleged that it would rot off in a very short time. Could anyone direct me where to find an authoritative statement on the subject? Any information would be thankfully received by a young—Mediævalist.

[6300.]—**Ventilation.**—Can any of your fellow-readers acquaint me with their experience of the "Tobin" system of ventilating school rooms? The one I have to ventilate has a flat ceiling, having a room above.—Boaz.

[6301.]—**Main Drains.**—What is the minimum size and fall of a main drain for a population of 1,000? Names of any books treating of sewers, their size, fall, construction, &c., suitable for a small hamlet would be acceptable to—A. B.

[6302.]—**Fence.**—I shall be glad if any of your readers, who have had experience of such matters, could advise me how to act in a question that arises as to a fence dividing two properties. Both parties agree that the fence must be erected at their joint expense, but disagree as to cost, or, rather, as to whether it shall be an erection that will last ten months or one that will last ten years, the cost in the one case being about three times that of the other, I being in favour of the more durable one. The ground landlord, unfortunately, will not interfere.—E. Price.

STATUES, MEMORIALS, &c.

Edinburgh.—There is about to be placed in the Dean Cemetery, Edinburgh, a monument in memory of the eminent landscape painter Nasmyth, by the distinguished inventor to whom is due the credit of having first successfully applied the steam-hammer to the work of the forge. The monument, which was designed by Mr. John Rhind, sculptor, Edinburgh, and has been executed by him in Binny freestone, takes the form of a massive Runic cross, rising 22ft. 6in. from the ground, and being entirely covered with carving.

St. Etheldreda, Ely-place.—Two life-size statues of St. Peter and St. Paul have recently been placed in position in this ancient chapel, on the carved stone corbels of the wall arcading under the arched gabling between the windows. It is intended to reinstate the whole series of the twelve Apostles and four Evangelists. The sculptor is Mr. Doherty, Blackfriars.

Liverpool.—Mrs. Turner, the wife of the late Charles Turner, M.P. for S.W. Lancashire, and formerly a Liverpool merchant, has formed the intention of commemorating her husband's memory by erecting a tower, in a prominent position, by the River Mersey, just about the centre of the pier-head, opposite the landing-stage. The designs for the tower have been made by Mr. A. Waterhouse, A.R.A.

WATER SUPPLY AND SANITARY MATTERS.

Metropolitan Water Supply.—An adjourned Conference of Delegates from Vestries and District Boards on the question of the water supply of London was held on Tuesday in St. Martin's Vestry Hall, when a memorial was adopted praying or the creation of a water trust in the Metropolis, formed on a basis similar to that on which elections to the London School Board proceeded, this body to be empowered to make arrangements with the existing Companies for the purchase of their rights, and, failing that, to procure an independent supply.

Our Office Table.

A large and influential Deputation of Peers, M.P.'s, landowners, and occupiers waited on Mr. Dodson last week, at the Local Government Board, to urge on him the necessity of introducing the necessary legislation in the next Session of Parliament to enable local action to be taken for dealing with floods. The Duke of Bedford introduced the Deputation, and the Speaker of the House of Commons, as representative of a county that suffers greatly from inundation, urged that as the question was one which affected more or less every watershed in the kingdom, it could only be dealt with by a general Government measure. Mr. Dodson, in reply, admitted to the full the pressing character of the evil, and promised to lay the matter before his colleagues, with the assurance that it would receive at their hands the attention its importance demanded.

The Bishop of Manchester in his visitation charge gives some good advice as regards the preservation of the material fabric of the church. His exhortation to the churchwardens to be always on the watch for the first appearance of dry rot is universally applicable, and will be accepted as a timely hint by all who have to do with the construction of houses or churches. The Bishop not only draws attention to this insidious disease, so apt to assail institutions as well as timber; he also points out the infallible remedy. Let in plenty of air. Provide for thorough ventilation. His Lordship objects to £3,000 as too large a sum to be spent on an ordinary parsonage, and directs attention to one that has lately been erected at Rishton, near Blackburn, as a model to be copied. It contains three sitting-rooms and seven bedrooms, with plenty of good cupboards, and has cost only £1,600.

No greater boon could be given to the inhabitants of London and other large cities, than the means of preventing smoke, and it is satisfactory to notice any new invention with that object in view. Mr. A. C. Engert, the inventor of recent improvements in the distribution of sound, lately described in these pages, has proposed a remedy which will largely prevent the formation of smoke from our furnaces. Many of the inventions that have been brought out are too complicated or expensive; but Mr. Engert's apparatus is one which can be fixed to any furnace; it is moreover exceedingly simple, and can be applied without much expense. Mr. Engert's apparatus is constructed on the principle of regulating the admission of cold air into a furnace, and thereby preventing the formation of smoke. The apparatus consists simply of a combination of shutters—one hanging down in front of the furnace, and another hanging down about 30ins. within it; and as the front shutter is raised to regulate the fire, the shutter within the furnace descends, by which action the admission of cold air is reduced or entirely checked. By regulating the admission of cold air into the furnace, smoke can be diminished, for it must be remembered that the cause of smoke is the admission of cold air, and that if we can prevent the condensation of the gases given out by fresh coals, we can prevent the formation of smoke. By Mr. Engert's patent, the gases as soon as they arise are consumed. Another serious objection to the common arrangement is that every time the furnace door is opened, the space is filled with cold air, which rushes under the boiler and robs it of heat by carrying it up the chimney.

The following rules, to be observed in the construction of all buildings erected under Her Majesty's Office of Works, have been prepared and issued by the Secretary to the Office of Works:—(1) All water-closets and urinals shall be constructed so that one wall at least of such closets and urinals shall be an outer wall of the building. (2) All soil-pipes shall be carried outside the building, and ventilated by means of pipes leading the foul gases above the highest point of the building. Such pipes to be carried to points removed from chimney stacks. (3) Separate cisterns shall be constructed for the water-closets and for the general purposes of the building. No tap or "draw-off" shall be affixed to any pipe communicating with a cistern supplying a water-closet or urinal. (4) All waste pipes or overflow pipes of cisterns shall terminate in the open air, and be cut off from all direct communication with drains. (5) Great attention shall be paid to insuring thorough ventilation in all rooms. Rooms so high that their ceilings shall be more than 2ft. above the top of the windows, corridors, staircases, and other open spaces shall be specially ventilated so as to prevent the accumulation of stagnant air. (6) All main drains should, where practicable, be formed outside the building. In the event of its being necessary to carry a main drain underneath a building, it must be trapped immediately outside the main wall, and a ventilating pipe must be carried from that point to the highest part of the roof, as under rule 2.

It is perhaps not to be wondered at that so many different opinions have been given respecting inclinations of sewers, as engineers are not unanimous on the question of rainfall, and so many circumstances have to be taken into account; but the following are a few leading opinions:—Sir J. Bazalgette thinks a mean velocity of 1½ miles per hour sufficient when it is running half full; Mr. Beardmore thinks 1¾ miles per hour enough; Mr. Baldwin Latham gives his opinion that no sewer should have a less velocity than 2ft. per second, while 2½ft. to 3ft., in very small sewers, would be better; Mr. Wickstead states that with a bottom velocity of 16in. per second, or 0·90 miles per hour, heavy pieces of brick, &c., will be removed, and that a velocity of 1·24 miles per hour is sufficient as a minimum; Professor Rankin says the velocity of current in sewers should not be less than 1ft. per second.

The Manchester Society of Architects, in their report for the past year, which has just been issued, state that they have for many years past been endeavouring to induce the Corporation of Manchester to consolidate and amend their by-laws relating to building, "but they have found their efforts so coldly treated by that body that they have unwillingly come to the conclusion that there exists neither a knowledge of the shortcomings of such regulations as are to be found here and there in various local Acts of Parliament, &c., nor a willingness to accept assistance towards remedying their defects from those who are qualified to advise; and that further efforts in this direction must be spared till some combination of circumstances arises giving a fair hope of success."

CHIPS.

At a meeting of the Gateshead School Board on the 10th inst., the plans of Messrs. Oliver and Leeson, architects, Newcastle-on-Tyne, for proposed group of schools at Durham-road were approved; the same architects were instructed to prepare designs for another group of schools at Askew-road.

At a meeting of the City Commissioners of Sewers, held on Tuesday, it was resolved that tenders should be accepted for the electric lighting of the City on three systems, the area of lighting to include Blackfriars-bridge, Bridge-street, Luddgate-hill, St. Paul's-churchyard, and Cheapside to King-street; Southwark Bridge, Queen Victoria-street, and Queen-street; London Bridge, Cheapside, King-street, Mansion House-street, and King William-street. The cost of lighting for twelve months from next February will be £8,060.

At a meeting of the congregation of Christ Church, Addiscombe, near Croydon, held last week, plans prepared by Mr. John Sulman, of Furnival's-inn, were approved for the proposed permanent church to be built in Canning-road. The style adopted is Gothic, and the external walls will be of red brick, with stone dressings. The church will consist of nave, with clerestory and side aisles and chancel; 635 sittings will be provided, at an estimated cost of £5,000.

Muckamore Abbey, a place of considerable antiquarian interest, situate between Antrim and Dunadry, has been totally destroyed by fire, together with a valuable collection of old furniture within, and the woodwork of a new mansion in course of erection beside it.

The town council of Carlisle decided last week, on the motion of Mr. R. S. Ferguson, to invite the Royal Archæological Institute to visit that city either in 1882 or 1883.

THE BUILDING NEWS.

LONDON, FRIDAY, NOVEMBER 26, 1880.

THE FUTURE OF CEMENT.

INCREASED interest has of late years been manifested in the manufacture and use of Portland cement, and our own columns have shown that good cement must eventually be employed to a larger extent than it is now. Mr. Redgrave's paper, read at the Association last Friday, and given elsewhere *in extenso*, dealt mainly with the chemical properties of limes and cements, into which we do not propose to enter; but the latter part of his paper proposes an innovation which will be read with some misgiving by architects who have invariably specified lime-mortar for their buildings, and especially by one school of revivalists. The doctrine that Mr. Redgrave sets forth is that cement is better, and more economical than lime for mortar-making, and to establish this proposition he enters into some details to which it is not necessary to refer, as they are already elementary truths. In the first place the author shows the capacity of cement for uniting larger quantities of sand and building materials than lime, and he thereupon argues its economy. Mr. Colson's experiments, cited by the lecturer, demonstrate at least with some degree of cogency, the superiority of cement-mortar mixed with loam over grey lime mortar, although they do not establish the absolute necessity for using a more adhesive mixture for ordinary building purposes. The experiments prove generally that the adhesive power of mortar, mixed in the proportions of 8 of sand to 1 of cement, with the addition of loam, was superior to grey lime mortar mixed in the proportion of 2 of sand to 1 of lime, the ordinary specification proportion. If the experiments recorded in the first table we publish are correct, the breaking strain on a briquette of 2·25 square inches shows double the strength for sand and cement than for sand and lime; but the addition of loam instead of lime shows a ratio compared with lime mortar of from 1·04 to 1, to 1·64 to 1. The object of these experiments was to find what proportion of Portland cement and sand would produce a mortar equal in strength, and as convenient to work, as grey lime mortar, mixed in the ordinary proportions. A working consistency was the necessary requirement in each case. Taking the second table of results, which we print, it also appears that Portland cement and loam mortar costs less per cubic yard than grey lime mortar by a considerable percentage. It is well known that the hydraulic limes yield less mortar; but we leave these facts to the consideration of the profession, though we are disposed to ask the question, before we abandon mortar: Is there any actual advantage derived from using a cement of greater adhesive power in our walls? No builder questions the superiority of cement for foundations, structures exposed to damp, marine and other purposes, copings, piers, arches, and everywhere, in short, where hydraulic properties and greater tenacity are required; but for ordinary wall-building, good hydraulic lime, mixed with sharp sand, burnt clay, or cinders, produces a mortar quite equal in power of resistance to good bricks. Regarding the structural conditions of a wall, it does not appear to us any economy to require that the mortar joints should be of greater strength than the bricks themselves, as in that case there would be no advantage gained. Of course, we are speaking of walls built with ordinary bricks, and not assuming the cement-concrete Mr. Redgrave proposes. No doubt, in theory, the strength of mortar should be sufficient to produce equality of resistance throughout the wall, so that the materials will break in a straight fracture and not follow the joints: this would be the perfection of wall building, and we believe well built walls, with mortar joints, would fulfil this condition.

Fat-lime mortar is decidedly objectionable, and we quite agree with M. Vicat and Sir C. Pasley that its use ought to be prohibited. The weakness of lime is increased often by the use of bad sand or sand of too fine a character. As Mr. Redgrave truly observes, mortar of this kind never sets in the interior; it is only the external skin that hardens, which prevents the further absorption of the carbonic acid in the air necessary to indurate. Both in damp situations and also where weights have to be carried the use of mortar of this description ought to be vigilantly rejected. In the use of fat or feebly hydraulic lime the admixture of clayey earth, puzzolana, or calcined silicious clay appears to be absolutely necessary, and the bricklayer can always avail himself of burnt clay or pounded bricks, which will produce an effect resembling those materials. Sharp, coarse sand also is sadly neglected by the ordinary builder, but its use is of the greatest importance in mortar prepared with fat limes.

One of the advantages of using lime mortar which the bricklayer would not be disposed to forego is that any quantity may be made, as it does not become injured by being kept or disturbed in the work, but in quick setting cements only a small quantity can be prepared at once.

Mr. Redgrave not only proposes to substitute cement for lime mortar, but says we should abandon bricks for building, and use in their stead cement concrete. He suggests that we should calcine our brick-earth in heaps, as ballast, and unite this burnt clay into monolithic structures with Portland cement. The idea is not new, but the very tardy substitution of cement concrete for bricks, and the results hitherto attained, have scarcely warranted the profession in making so sudden a change. Prejudice and traditional practice have, no doubt, together operated in blinding architects to the use of concrete; yet we cannot unconditionally affirm there are not some grounds for their retention of brickwork. One of these is the difficulty experienced in manufacturing cement of the right quality for architectural purposes, and another the advantage derived in being able to construct features in brick or terra-cotta of a variety of descriptions, such as windows, arches, chimneys, giving them at the same time any form the necessity of the case required. The methods required in constructing monolithic walls, or in casting concrete into different forms, rather tend to deter the builder—at present, at least—from venturing upon a new path.

On artistic grounds the architectural profession have, it must be acknowledged, some slight reason for withholding their sympathy for cement as a decorative material. The age of "compo" still retains its unpleasant associations in the mind of the "art" architect; the reign of stucco created a fictitious kind of style, which, unfortunately, has left a bad name, and there is a strong conviction that all salient features ought to be constructed. But deeper than this is the conviction that moulded and cast work destroy all individuality and charm, and reduce to a dead level the ideas of the artist. Till this belief is eradicated, we are much inclined to doubt whether concrete building will ever obtain the hold its ardent supporters desire upon the artistic mind. That the artistic mind is always right in these matters it would not be safe to assert; the influence of precedent has an irresistible power over some men, and we think the apostles of cement concrete can well afford to wait a change in architectural feeling. Machine-made concrete lintels and sills, window-heads, &c., may at present sicken the devotee of painstaking hand-labour; he may feel disgusted at seeing the miles of artificial stone in model dwellings, prisons, and barracks; but this feeling, we venture to say, will yield when the artist once begins to understand the material, and to model it to his requirements. Much may be done to render cement decorative; for purposes of surface ornament a great deal has already been accomplished; and we have still hopes that some efforts will be made to introduce colour to heighten the relief. One manufacturer, Mr. Lascelles, has already been successful in making cement bricks and tiles of the colour of red brick, and, if this can be done, we do not despair of seeing cement architecture again coming into fashion with stronger recommendations than it has up to the present offered.

DESIGN IN ARCHITECTURAL MOSAIC.

IN our series of articles on "Architectural Mosaic" last year,* we confined ourselves for the occasion to a very full description of the materials and various technical processes employed, both in ancient and modern times. The subject, however, would be incomplete without some further remarks upon the peculiar principles which should regulate its design and application. Good workmanship, even when employed on good materials, is not necessarily enough to insure perfection in mosaic. The craft of the mosaicist is artistic as well as mechanical, and a good design is absolutely essential to success. But although a good design is perhaps more necessary for mosaic than any other of the decorative arts, for reasons we shall presently show, there is a natural tendency to make it a mere matter of copying manufacture and mechanism. This tendency, indeed, operates in other arts, but attaches itself more especially to mosaic, through the dangerous facility wherewith copies may be reproduced by ordinary workmen, which not only in appearance, but in actual fact, are quite undistinguishable from originals. Nothing can more seriously endanger its prospects of general acceptance. Mosaic, when used for decoration of a building, is so entirely dependent for its due effect upon its relation to the lines of the architecture, upon the chromatic effect of adjacent colours, upon the incidence of light on its surface, upon distance from the eye, and upon its general harmony with the prevailing tone and style of the building, that special designs are absolutely necessary for every structure of any pretensions. Copied mosaics will hardly ever be found suitable in all respects to buildings or apartments other than those for which the originals were designed, except indeed on a very small scale, and in comparatively unimportant positions. The design of a mosaic is, in fact, almost, though not quite, everything. Mechanical defects are often unperceived from the distances at which mosaics are usually seen; but defects of design always come into glaring prominence in spite of the most perfect mechanical execution. The adaptation of every decorative design to architecture should be subject to the special control of the architect, and of him alone. The mind which designed a building is, as a rule, the best qualified to give an air of unity of purpose and completeness to its permanent decoration. This principle applies to all forms of art, but in a higher degree to mosaic than to others, not only because it forms an integral and inseparable part of the architecture, but also because its mode of construction aproaches very closely to that of the edifice itself. Unlike an easel-painting which can be removed, or a fresco which fades or peels off, it is built into the substance of the structure as effectually as the bricks and stones themselves, and is, with them, incapable of destruction, removal, or alteration, without mutilation of the fabric as long as it stands. One writer has very aptly compared the union of mosaic with a building to that between husband and wife, and thence has drawn the inference, that, like a good wife to her husband, mosaic ought to enhance all the good qualities of the structure to which it belongs, and conceal its defects. For example, it may, by a preponderating number of vertical lines, give the appearance of height, where height is necessary, or where length is wanted, it may give the appearance of length, by a predominance of horizontal lines. It may do so much in common with other coloured decorations, but in a higher degree than they; it may brighten the obscurity of some parts by its glowing and unfading colours, or it may render dark places luminous, by its gold grounds and lustrous surfaces, while, on the other hand, it may subdue the dazzling effect of excess of light by a design in which shadows and deep quiet tones predominate.

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* See BUILDING NEWS for March 21st, 28th, April 11th, 18th, and 25th, 1879.

There are, however, special limitations and technicalities, arising from the nature of mosaic itself, which must be carefully kept in mind in the preparation of every design.

First and foremost of these is *simplicity*. This is an absolute necessity imposed upon mosaic, not only by the great costliness of minute and complicated work, but also because small touches of art, whatever be their intrinsic merits, are lost to sight from the great distances at which mosaics are usually seen. The subject must be simple and its treatment simple also. The figures must not be too many, nor too crowded, and much must be dispensed with that would be perfectly possible and legitimate in painting. For example, foreshortening and perspective can be used scarcely at all, and energetic action of the figures, which would involve much complication of light and shade, must be introduced very sparingly. The principal figures to be aimed at are breadth of design, beauty of proportion, and harmony of colouring. It has been well said, that in relation to painting, mosaic is what painting itself is to Nature, not its copy, but its sense—a translation of its language into the conventional language of another art, and intended to be employed for a distinct purpose. Pictures worked with so much elaboration and skill as to rival the productions of the easel, may be, and are, produced by mosaic workers, but they are entirely outside the province of the architect, and are no more to be considered architectural decorations than the canvases hung in the National Gallery. There are, it is true, in St. Peter's at Rome and elsewhere, mosaic copies of the works of the great masters of painting, which are truly wonderful as examples of the great perfection of which mosaic is capable; but their cost is fabulous, and, as a matter of fact, they were not executed as architectural decorations, but with a view of copying and preserving the colours and designs of the originals, which it was believed were in danger of perishing.

A true relation and adjustment of a design to the lights and shadows of a building is also of very great importance. This point requires very peculiar and careful study, owing to the extreme vividity of reflection from the vitreous surfaces of mosaic, and the many angles at which it is possible for the light to be reflected. To attain a perfectly satisfactory result in this respect will tax all the skill and judgment of the designer. We have been in churches where the dazzling light reflected from the gold background of a mosaic, at a right angle to our eye, was the first thing that met us upon entrance, and this glitter not only obscured the design of the mosaic itself, and of objects close to it, but produced an absolutely painful effect on the eye. We fully believe that a want of proper adjustment of mosaic to the angle of incidence of light has been one of the main causes of its too partial adoption as a wall decoration up to the present time; whilst, on the other hand, its perfect adjustment to the light falling with varying brilliance, and at different angles during successive hours of the day, forms one of its chief glories in the Mediæval structures of Italy, where mosaic is to be seen in its highest perfection.

One of the most eloquent passages in Mr. Ruskin's writings upon St. Mark's, Venice, is a description of the glorious effects of the light falling upon its different mosaics at various hours of the day, rendering it at no period, morning, noon, or evening, glittering or painful, but always beautiful, rich, bright, and harmonious.

To the same purpose are the remarks of Sir Digby Wyatt upon the cathedral of Monreale, in Palermo. "Having drawn and studied hard in it for many a day, from dawn to sunset, I can bear humble testimony to its invariable beauty under every changing condition of light and shade. Whether bathed in sunshine, and all alive with glowing colour, or almost dark at closing day, retaining to the last some lingering gleam upon its gilded wall-faces, its aspect is one, not of gaudiness nor gloom, but of serene and dignified magnificence."

Within the above limits, and frankly accepting the technicalities and conventions of his art, the mosaic designer has still a very fair field before him. Of one thing he should specially beware, and that is of being a mere imitator of any of the styles of the past. Mannerism and affectation should be especially avoided, and the designer must steer clear of the Scylla and Charybdis of too much and too little academic knowledge. True art is very eclectic, and knows how to refuse the evil, as well as how to choose the good, from among the examples of the past. For example: if the good designer aims at the breadth of decorative effect, the nice proportionment of scale to distance, the judicious use of architectural bands, margins, and string-courses, and the just accentuation of leading architectural features, which distinguish the Byzantine school, he will none the less avoid its utter conventionality, which in course of time crystallised into hardness, under the influence of which the style, losing its soul, life, and vigour, became more and more dull and lifeless until it faded away. Equally will he avoid the mistakes, and adopt the good points, of the Italian school which succeeded to the Byzantine. With the artists of that school, he will go to Nature for his models; but, unlike them, he will not aim at the direct imitation of painting, which the materials he uses can never be expected satisfactorily to attain. He will enter upon the study of his art with the object of adapting it to the varying circumstances and needs of the epoch when it is executed, and in the employment of historic symbolism, and the adaptation of the styles of various nations and periods; he will enter rather into their spirit than try to copy their letter, and in seeking newness and variety will be careful to avoid extravagance and eccentricity, as well as everything that is out of harmony with the tone of the building, to which, after all, the mosaic is only subservient.

The designer of mosaic should also be half a mechanic. He should know all the capabilities of the material, and the difficulties of construction, and all the special technicalities which arise from the exceptional nature of mosaic material. First among these is the cement jointing. At first sight it appears a great limitation of the art and a special difficulty; but in the hands of a true artist, who is thoroughly imbued with the spirit of his work, it becomes a most useful means of heightening and improving the expression of the effect he desires to produce. The jointing is to a mosaic designer exactly what the lines and reticulations of an engraving or etching are to an engraver; and the rules of taste which apply to the one, apply equally to the other. For instance, as the engraver's lines, by convexity or concavity, express the undulations of drapery, and the modelling of surfaces advancing to or retreating from, or above or below, the spectator's eye, so precisely should the directions of the jointing of a piece of pictorial mosaic. Again, as the regular ruling or cross-hatching of an engraved half-tint is made to give value to the broken lights and shades of the leading figures, to which, by their vivid contrasts, attention has to be attracted—so should the uniformity of the jointing with even-sized tesseræ diminish the brilliancy of a mosaic background, breaking up the light which would otherwise be so strongly reflected from, say, a white or golden background—as to quite kill the effect of the figures or ornaments to be relieved upon it.

Another point which should always be attended to in arranging the jointing, is to allow a row of tesseræ, of the same colour as the ground, to always follow every leading contour profiled upon the background. The use of this rule, which is invariably followed by all good mosaicists, is to prevent the directions of the generally horizontal and vertical jointing lines of the background from cutting awkwardly against the profiles, which the eye should be allowed to follow without being led off into other channels, or distracted by the occurrence of irregularly-shaped tesseræ next to leading forms. This reduplication, as it were, of mosaic outline has almost the effect of the lead-line in stained glass, and is not much less essential to good effect.

Every mosaic requires an inclosing frame of some kind or other, and the design of this frame is worthy of almost as much consideration as the picture itself. Being a permanent adornment of a building, the lines of architecture, string-courses, archivolts, imposts, bands and friezes, form a natural and inseparable framework. But there are principles which apply even here. Compositions of a serene, statuesque nature require very thin lines to surround and separate them from each other. In the very calm, quiet works of the Byzantine school, the lines dividing them are very thin, sometimes formed only by the simple shaft of a tall palm-tree; but in the Later Romanesque and other styles, in which the action of the picture is agitated and lively, and full of bright and varied colours, a stronger boundary is necessary, and a more massive framework, of vivid and contrasted hues, as a corrective.

MOSAIC DESIGNS FOR PAVEMENTS.

In a large building, one pattern covering the whole floor is unquestionably bad in principle, because its tendency is to lessen the apparent size of the building. A pavement of this kind, however beautiful, is a beautiful thing misplaced. A similar remark applies to every subject whatever in which pictorial effect is aimed at. If a picture be good its proper place is not where it will be trodden underfoot. The Romans were great sinners in this respect. We find, in all parts of their ancient empire, the remains of pictured pavements, which, however valuable to the archæologist and however interesting as abstract works of art, are to the practical mosaicist examples only of what he should avoid. Every pattern that represents a raised or uneven surface is out of place on a floor-surface. Geometrical patterns, and a flat, conventional use of the outlines of natural objects are the best. In St. Mark's, at Venice itself, there are designs representing raised surfaces, and at Sienna Cathedral there are pictorial representations of birds, flowers, and fruit; but wherever found in floors, such pictures are out of place, and not to be imitated. The most successful and beautiful mosaic pavements of the Mediæval epoch that remain to us are treated in a remarkably simple way. Much surface is brightly covered with small diaper patterns in a few colours, and low quiet tone, in which the patterns are frequently varied, or the colours interchanged. The separation of the pattern is not effected by elaborate borders, but where they are not boldly carried up to one another, the separation is made by a simple band of marble or stone, as in St. Mark's. The colours used must either harmonise with those on the walls, or a neutral gray tone must pervade the whole.

THE WINTER EXHIBITION AT THE DUDLEY GALLERY.

ONE of the first Winter Exhibitions of Pictures to open—that of the Dudley Gallery—is generally remarkable for a number of studies in oil of much merit. Some of them probably may be pictures that have not been successful enough to obtain admission into the Royal Academy, others are the work of the past season; but they have all an interest to the lover of what is known as *genre* painting. The manners of everyday life supply an exhaustless fund of material to the contributors of this favourite little gallery, and we have only to mention the names of Barrable, H. Maccallum, E. F. Brewtnall, J. B. Burgess, A.R.A, A. Ludovici, P. R. Morris, A.R.A., Leslie, R.A., Leon Lhermitte, Barraud, and a few others, to convince the reader of the quality of the present year's programme. Commonplace incident in the hands of the true artist can be rendered very attractive at times, as in Miss Mary L. Waller's charming little picture entitled "The First Violin," where the juvenile performer, a little fair-haired girl in black, is amusing herself with a violin. The green background of park would doubtless have better harmonised with any other colour than black. "Y' Brig" is the title of an unpretending sketch of homeliness, a peep of a white trim little house between a foreground of trees, vigorously painted by Mr. Cyrus Johnson; another touching but simple study is Mr. E. F. Brewtnall's "Footbridge" (18), in which a young maiden is painted leaning over a rustic rail, with a basket of flowers in her hand, pensively watching the stream running beneath her. Perhaps the idea is a little sentimental, but the painter has divested it of feebleness. T. Danby's "Fisherman's Home," near it, is almost Claude-like in manner—a little hard, but certainly quiet and serene. Mr. R. W. Macbeth this year gives us a sunny thinly-painted figure, "A Brittany Waitress," in a style common to many modern painters, a shadowless kind of treatment in which half-shades are freely indulged in. Passing Mr. E. A. Waterlow's "Spring Time," which is clever, we come to a canvas in which the artist, Mr. G. F. Munn, has chosen an amusing theme. In a stately room, furnished in a style of the Georgian era; seated near a table spread with a cloth, on which are the remnants of a repast, is a child in a large arm-chair, being diverted by a young lady attired in a salmon-coloured satin dress, who is going through the steps of a dance. The accessories are highly finished, and the colours harmonious. One of the most striking flower-pieces is No. 53, "Panier de Fleur d'Automne," by H. Fantin, a vigorously painted group of bright blossom carelessly strewn over a hamper. The colouring and features of "A Spanish Lady," by Mr. J. B. Burgess, A.R.A., are all that the most fastidious admirer of the brunette could desire; and Mr. A. Parson's view of "Morning on the Kennet," is equally pleasing as a broadly-treated river running through meadows. Very chaste in drawing and colour is Miss Letitia Parson's "Climbing Clematis," a delicate study of this popular English creeper, on a grey ground. Mr. Arthur Severn, a frequent contributor to this gallery, sends two pictures, one a large canvas, "Westminster at Sunset," a truthful representation of that favourite view of the Thames. The shadowy mass of the Legislative Palace stands out from a sunset sky veiled in a hazy mist, and the artist has not fallen into errors of proportion. Below this picture is another clever marine composition by Mr. Hamilton Macallum "Luring a Tide-left Conger." Nothing can be more satisfactory than the three urchins, one lying on a rock, intent on catching the stranded conger in a pool of water. The ruddy glow reflected on the faces, the blue ripples of the sea in the background, are inimitably painted. Hung rather high is an expressive study of a woman at prayer, "A l'Eglise," by W. Lomas. "Braiding a Pennon," is a classically-conceived subject—a sedate-looking maiden dressed in a richly embroidered fabric, with pearl head-piece, painted in the poetic strain. Mr. John Scott, the painter, has evidently caught the manner of the Burne-Jones School. "The Lace Maker" is another carefully-finished cabinet picture by Mr. F. G. Cotman, pathetic in sentiment; and the visitor cannot overlook Mr. P. R. Morris's "Première Communion, Dieppe," a procession of young girl clad in white veils, painted with much feeling. Mr. G. Clauson, a talented artist, has, with his usual felicity painted a moral in the simple figure of a choir boy behind a screen apparently eating an orange in his "Harvest Festival," while close to it is a remarkable picture by Mr. J. MacWhirter, A.R.A., called "Thunderstorm on the Grand Prairie," where a tempestuous sky, illumined by lightning, and a train tearing through the storm, are the chief features, reminding us rather vividly of Turner's famous picture in the National Gallery. One of the few subjects of architectural interest is Mr. E. W. Waite's truthful picture of "Old Tangley Manor." The brick-work, tiled-roof, pargetted gables, and the garden in front are cleverly painted; but it is hung too high.

Decorative subjects are few. We notice one ideal study, by Mr. E. Matthew Hales, "Scarlet Ibis" (128), showing much refinement in drawing and colour. Mr. G. Hindley has given us a spirited and forcible sketch of an old Cavalier dressed in the short trousered breeches, and green doublet of Charles's time, playing a violin in front of an old-fashioned fireplace; the furniture and details of the room are in good keeping, and the title, "Music hath Charms," is no less happy. A more every-day incident is depicted by Mr. C. B. Barber in "A Narrow Escape"; a large tabby cat has just sprung, and has managed, with her claws, to bring down a few feathers from a bird just on the wing; the cat is marvellously life-like in her movement and expression; Mr. E. H. Fahey's "Titbit" is also excellent in the water, and the leafless trees in Frank Walton's picture, No. 141, are exceedingly truthful. Few artists can make a picture out of such apparently hopeless and uninteresting objects as a wall and a road, but Alfred de Breanski, has certainly done so in his "Monastery Wall."

The end wall of the gallery displays not a few clever oil studies. Mr. G. D. Leslie, R.A., contributes two plotless subjects from home-life. The girl peeling apples for dumplings (150), and the companion picture (162), "Cherry Pie" are too tamely real in execution and commonplace in sentiment to entitle them to the rank of ideal pictures, yet we cannot but admire the care shown in the painting of the kitchen and its accessories, and the winsome faces of the young cooks, nor the quiet colour. Mr. E. H. Godard has been equally clever in depicting "My Wood Engraver's Bench at the *Graphic*." Natural scenery abounds: A. de Braenski's (171).

"The river glideth at its own sweet will" is boldly painted, and the foliage vigorous; but perhaps one of the most popularly attractive pictures of this wall is Mr. S. E. Waller's thrilling canvas "The King's Highway." As we look at the well-dressed bandit on horseback, and the terror stricken foot-passenger thrusting his hand in his pocket, we are at a moment's loss to know which is the highwayman except for the pistol which he steadily points to the hapless gentleman. Of course, the plot is sustained by the costume, the cocked hat, knee-breeches, and silk coats of the Regency. "October" is the title of an oblong picture by Mr. Tom Lloyd, a study of weeds and gorse rendered with considerable power. G. H. Barrable's "La Perichole" and two subjects by Leon Lhermitte (No. 190), "Le Calvaire de Mont St. Père" and "Le Déjeûner," are also excellent. The grey-toned street and memorial cross in No. 190, and the cottage interior and figures in the last are in Mr. Lhermitte's well-known forcible style. Mr. E. G. H. Lucas is inimitable as a painter of still-life. His suggestive picture "Should auld acquaintance be forgot?" is really pathetic in appeal. Here is a group recalling our schoolday life—a bag of marbles, some old lesson-books, bat and wicket, and, not less amusing, a slate, with a figure of the old schoolmaster, bringing back pleasant though almost-forgotten days. Mr. J. MacWhirter's "Summer Storm, Venice," with the palaces like pearls against the dark sky and blue water; Mr. H. Moore's cleverly-painted sky, 218; Mr. H. Stacey Marks' "The Miller of the Dee"; Mr. Stracey's "Old Bachelor," Mr. Joseph Knight's "April Weather," a sparkling bit of light and shade; Mr. E. Armitage's "Souvenir of Algiers," Mr. F. Dillon's sunny landscape, "A Lock and Mill on the Rother"; Mr. C. J. Lewis's masterly and solidly-painted sunset landscape with a bright stream, and Mr. E. S. Kennedy's humorous picture of two ladies who have taken refuge on a seat with a mouse on the floor, entitled "Master of the Situation," are all deserving notice.

Flower-pieces are, as usual, numerous at the Dudley. Besides Miss Parson's delicately-painted "Climbing Clematis" we have noticed, we may draw attention to the same lady's "Snowdrops" (88), H. Fantin's "Nasturtiums" (116), Mrs. H. Thornycroft's "Study of Roses," (208); Mrs. Shenck's "Honeysuckle" (342); "Chrysanthemums" (311), "Rhododendrons" (301), "Blackberries" (376).

Mr. J. H. Midgley has succeeded in representing a pebbly river-bed in 335; and as a work of poetic sentiment, we must award praise to Mr. T. M. Rooke's picture of "The Ended Tune," a young girl closing her pianoforte, with a half-saddened, half-rapturous expression. Humour and quaint drollery are well told in Mr. Stock's "Pons Asinorum," a school-girl before the black board, attempting to demonstrate that puzzling proposition of Euclid; in the "Old, Old Story," by Mr. T. W. Wilson, a young fisherman at an open cottage window with sea beyond, saying sweet words to a girl at crochet work; and especially in Mr. J. C. Dollman's clever bit of humour, "Carriage Talk," where a little girl, with a Mother Hubbard bonnet, is seated in a wheelbarrow, her companion being a black kitten, and her ensign a huge sunflower, while behind, on the ground, sits a humble dejected-looking dog, wistfully gazing. A weird picture of the "impressionist" school is Mr. W. H. Overend's "Towing Home." We must pay a passing word to the following:—"Vue de Rouen," hard and stiff; "Beyond these Fogs," an ideal by Pepys Cockerell; "The Last Load," by P. Macquoid; "January," by J. H. Snell; "The Escape," an historical reminiscence of the Royalists, besides a few clever cabinet subjects on the screen. A touching incident is Mr. Armitage's small study, "After the Arena," Mr. Turner's No. 411, Mr. Hindley's sketch, "The Challenge," and a clever figure study of a girl before a screen of gilt leather by Mr. Walter Crane, a pleasant harmony. "Off Rotterdam," has some good grouping. We may also pick out, before leaving the gallery, Mr. J. S. Hill's "Riverside Meadows" (No. 9), Mr. Stock's "Among the Sheaves" Mr. J. O'Connor's "Paul's Wharf," from the crowd, nor can the visitor take his departure without bestowing a glance at the sculpture. Mr. Lawson's "Jeannie Deans," and Mr. Calcott's "Dorothy," are particularly worth notice.

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A RECENT VISIT TO RUSSIA.

(*Concluded from page* 494.)

THE CHURCH OF THE REDEEMER,

OTHERWISE the "Temple of our Saviour," at Moscow, is a building worthy of a passing note. Its site is on a neighbouring hill to the south-west of the Kremlin, in which position it is a conspicuous object in the city. From the fact of its being on the bank of the Moskva, from which it is separated by a road or quay, it has a pleasing effect when viewed from the south side of the river.

Its object is to commemorate the French invasion of the city in 1812, to which the inscription over the door "God with us," may be traced. Some miles to the south of the city stand the "Sparrow hills," the spot from which the French first drank in the sight of Moscow, the place of their great errand, and here, on the very ground that bore the footprints of Napoleon, the foundation of this church was laid upon the Emperor Alexander returning from Paris, 1815, and the works, supported by contributions of the whole nation, were pushed on on until the walls were about 14 feet above the ground, at which stage, owing to the sandy character of the site, the works had to be suspended, and the project of completing the church on this site abandoned.

The building on the new or present site was commenced in 1844, and for the last 35 years its erection has been in progress. Its opening was fixed for the 25th of August, 1878; but, as they decided to construct a series of steps and terraces leading down to the water, so that the river could be blessed in the orthodox manner, the ceremony was postponed until the August of 1879. This delay was matter of regret to M. Torr, the architect, who, being far advanced in years, was afraid he should never be spared to witness its completion. This building, for a Russian church, may be termed large; its style is Byzantian, and its form is square, with a large central dome and four smaller ones. These domes are covered or faced with metal and gilded, and here we have a note of great interest, one that gives us a true estimate of the climate and the purity of the atmosphere, for these domes have been gilded for the last eighteen years, and they are as fresh and bright as if the work of yesterday. The same remark applies to the walls, which are of sandstone, for these are as clean and fresh as the day they left the hands of the mason. The architect, a native of the city, has drawn his inspiration from the models around him, and hence, artistically, it is not up to the standard of the new church we noticed as being erected in Riga; nor is it by any means on a par with the work of Mons. Montferrand in St. Isaac's Church at St. Petersburg. Moscow is essentially a city where Byzantian architecture is largely indulged in, and, as this is not handled with the artistic feeling that characterises the works of Classic artists in St. Petersburg, it lacks in features worthy of admiration.

The sandstone, the material of construction of the church in question, is the same as we noticed in the façade of the Italian Opera House, and we regret to say we have the same conflicting testimony as to the situation of the quarries from which it has been drawn. This building is remarkable as being the only one we saw in the country that is wholly wrought in native sandstone. Of the interior we can say but little, access to the same not being readily obtained; but we learn that it is rich in gilding and in marble work. A great part of the polished stone is said to have been drawn from Labrador, but this statement we should doubt, as Russia itself is very rich in native marbles.

Having exhausted our notes upon Moscow, it is useless entering upon a series pertaining to other towns, as they would only be parallel in their character, and hence we purpose to terminate our review with a few

GENERAL REMARKS.

As geology shapes the trades, and suggests the localities of great or small populations or congregations of people, so do climates shape the manners, customs, and habits of a people. England is a country where extremes of heat and cold are practically unknown, and provisions for or against the same are but partially or superficially made. Russia possesses a climate more pronounced in its extremes, and more positive in its action. In the summer season the heat is intense, and the duration of light is such as to render the term "night" a misnomer. In winter this order is reversed, as the country is then subject to a season of frost, and an absence of light, the day being contracted to five or six hours. It naturally follows that a system of greater seclusion in the houses obtains in the winter time, and of exposure in the summer, than is common with us, and hence it follows that the houses of the great towns and cities are constructed to meet these special requirements. The walls, as a whole, are far thicker than is common to us, and these are cemented or stuccoed on the face with the object of keeping out the heat, the rain, and the frost, and hence brickwork, so common with us for the face or finish of a building, is practically unknown. The windows are larger and more in number than in England, and, as they are invariably formed of four casements to open outwards, the amount of air admitted in the hot season is double that which can be obtained in the case of sliding sashes. The frames of these windows are rebated for an inner, a second, or winter sash, which effectually checks the entrance of the outer air, and forms a film of neutral air between the inner and outer atmospheres. The doors are folding, so that in the summer a larger opening is presented, and in winter, when one flap only is used, a smaller one than is common to us. The staircase, the heart of the house, never communicates with the outer air, as a lobby with single or double doors is always provided. Sleeping-apartments above the level of the eaves are unknown, the space in the roof being set apart as a storeroom. Open fires, from the currents of air they set in motion in the apartments, are alike unknown, and the heating is effected by gigantic stoves of brick, cased with sheet iron, or wholly constructed of porcelain. The principle followed in these stoves is to provide a large face or warming area, and to gently warm, and not burn, the atmosphere. The ventilation is a real difficulty, and in most cases none whatever exists. In private houses, from the fact that stoves are provided in every room and every landing or passage, a summer atmosphere obtains, and the doors being set open, the principle of dilution, which is the next best to perfect ventilation, is well carried out. In such houses, where the number of the family is but small, a degree of comfort obtains in the severest weather that is wholly unknown to us in our English homes during an English winter. The evils of this system are most present in the domiciles of the working-class, or the lower orders of the people; in these abodes, mostly of one room, in which they live during the day, and sleep during the night, the atmosphere is literally putrid, as the only principle they pursue is that of excluding every draught of fresh or cold air. A parallel to this may be found in many of the hotels, where a traveller's room is his castle. In it he takes his food, except in the case of dinner; here he sees his customers or his friends; and here, on a half-developed bed, almost void of clothing, he sleeps. The air is seldom changed, and its purity is not improved by the stove if any leakage exists therein. The temperature in this case is seldom under his control, as the firing of the stoves is done in the passage; and, under the impression that an Englishman requires to be kept warm, the stokers give you that attention which amounts to a roast. In the mansions of the great, hot air generated in the basements is supplied to every apartment; but being so highly-dried it is dangerous to constantly inhale the same, and hence the better-class people are subject to throat disease, a complaint common with the whole populations of Germany, Denmark, and Norway, where iron stoves are used, but one less noticeable in Sweden and Russia, where earthenware stoves are in common use. The principle adopted in the houses is to wear light clothing in the winter time, and never to sleep in cold rooms, and, upon entering the open air, to wrap themselves up in furs and felts, so that the animal heat of the body cannot escape. In this direction it is curious to note the habits of the lower orders. The watchmen guarding the doors in St. Petersburg during the state of siege in December last, were a heap of sheepskin and felt, and, instead of exercising themselves, as we should be inclined to do, they sit on blocks of wood, or on the frozen doorsteps, and sleep for hours, the only precaution they take being to turn their faces from the wind. Again, the Laplanders will camp upon the ice of the Neva, and, protected by this animal clothing, make their beds upon a few boards laid on the ice. Clothing of cloth is out of the question, as the animal heat would make its exit, and the frost its entrance, through such a medium.

The difficulty of moving about in the winter is very great, from the fact that you have a double suit of clothes upon you, even down to your boots, the outer suit being much larger and much heavier than the inner suit; buried in such clothing, you are bound to make your progress by the aid of sledges, as an hour's walk on a bitter cold night would get your body in such a steam that, upon gaining the hotel, you would have to divest yourself of your damp underclothing. This difficulty of moving about applies to both male and female, and hence the streets of the cities are filled with sledges, and the tram-lines are cut out of the snow and ice at any cost. The impression you form, after residing in Russia for a few weeks in the winter, is that this season is got over with less discomfort than is the case in England, and that the English house, the English clothing, the English travelling, and the English climate, might be improved upon.

The detail that most impresses the stranger is the wealth and splendour that surrounds every member of the Imperial family. These are all provided with great palaces, those belonging to, and occupied by, the Czar of All the Russias being the finest and the costliest in the world. Judging from the surroundings of the old Emperors at Moscow, the present ones at St. Petersburg have made unheard of progress in the accumulation of wealth, and it is difficult to see where this absorption will end, for the acquisition of fresh empire increases the property of the crown, that of the conquered kings passing to the personal estate of the great autocrat. Of a middle class you see little except at St. Petersburg. This is a growing power in the land, arising out of the pursuits of trade and manufactures, which are fostered by the government from their ability to employ the labour of the people, which is such a drug in the winter season. The drawback to the rise and development of this class is the fact that these trades are mainly pursued by people of English and German nationality, who, despising the country for all but its yield of wealth, return to their own lands upon the the acquisition of ample fortunes.

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ARCHITECTURAL ASSOCIATION.

THE second ordinary meeting of the Association was held on Friday evening, the President, Mr. E. C. Lee, in the chair. The following new members were elected :—F. M. Tullock, A. Richards. C. Hunt, W. Cooper, W. M. Mitchell, F. H. Goddard, W. Bennett, W. Mills, John R. Smith, G. Gilbert Woodward, G. Hanson Sale, G. W. Ward, A. Walmisley, R. Astley, J. Adkins, A. Clapton, A. Crow, W. P. English, F. Pullam Gulliam, H. H. Kemp, E. H. Selhy, R. H. Tebh, H. T. A. Chidgey, F. R. Oglehy, T. A. Andrews, R. Barker, E. J. Rand. B. A. Colley, A. B. Few, A. K. Stephens, F. W. Muncey, A. W. Trihe, A. C. Houston, G. F. Byron, F. Huntley, W. Gilbruth, E. H. Pritchett, Percival Vernon, F. S. Capon, B. F. Simpson, F. Rountree, F. Wilcocks, T. H. Roberts, J. R. Younger, R. M. Kearns, H. Ling, F. Lovell Lee, W. Parker, and E. E. Carpenter. The Librarian having announced three gifts of books to the library, a vote of thanks was passed to the donors, Mr. T. Roger Smith, Messrs. W. and A. Audsley, of Liverpool, and Mr. Henry Taylor. Mr. J. S. Quilter informed the members that the memorial work to the late Mr. Edmund Sharpe, M.A., was almost ready for publication; the whole of the plates, sixty in number, had been lithographed, and the letterpress only needed final revision. The memorial committee wished to know how many copies should be printed off; up to the present only 134 subscribers had sent in their names, and it was hoped this would be raised to at least 250. In reply to a question, Mr. Quilter said the price of the work was 1½ guineas. The President announced that Mr. C. G. Vinall would be unable to read his promised paper on "Furniture" at the next fortnightly meeting of the Association, and that Mr. W. Hilton Nash would fill the vacancy with a paper entitled, "Architecture and Architects of the 16th Century."

THE USE OF CEMENTS.

Mr. Gilbert R. Redgrave then read a paper upon this subject. There is probably, he remarked, no more deeply-rooted conviction prevalent among architects than the firm belief we cherish in the excellence of Roman mortar. The Romans distinguished themselves among all the conquering nations of antiquity as mighty builders, and throughout every country which they subdued, we find the remains of public works and buildings, more or less perfect, as evidences of their occupation, and monuments of the skill and enterprise of their architects. The builders of Rome undoubtedly made use of the limestones of the countries in which they worked; sometimes they came across good limes of a cementitious character, and at others they found only fat or rich limes. In the former case we find the structures which have escaped destruction at the hands of man still extant; in the latter, where the mortar was made of bad or unsuitable lime, the buildings have crumbled away, and have become obliterated by natural causes. The secret of the excellence of Roman mortar, so often and so laboriously sought after, is, to a great extent, a delusion, and we praise the mortar of the ancients only because all the bad mortar has long since perished. Nevertheless, we indirectly owe to the Romans the discovery of all our modern cements, for it was in consequence of researches made respecting the reason for the durability of ancient mortars that what has been termed the hydraulicity of limes, was explained early in the present century. To our own countryman, Smeaton, the builder of the Eddystone Lighthouse, and to Vicat and others, on the Continent, must be assigned their due share of credit for these discoveries; and their labours have since been ably supplemented by the investigations of Pasley, John, Fuchs, and Pettenkofer. It seems astonishing, in these days of rapid building, to read the specifications of even 100 years ago, and to learn the amount of labour then bestowed on the preparation of the powdery or chalk-lime mortar of that period. Batty Langley, writing in 1748, said: "The best terrace mortar is made with two bushels of hot lime, and one bushel, &c., of terrace, [sand probably brought from Holland], well incorporated by beating. And which quantity to beat well is a good day's work for a labourer"! It was from no disrespect for the white chalk lime, but rather from some strange belief in the colour of grey lime, that about the middle of the last century a fondness arose in London for what was called "stone lime," such as that of Dorking or Merstham. The only reason for the choice was that this lime was supposed to be of a stone colour. It was a fallacy dating back to the time of Vitruvius, that the harder or denser the stone from which a lime was burned the harder would the mortar made from it eventually become. Smeaton was the first to demonstrate this to be a mistake. So strongly was this error held, however, that Smeatou tells us advantage was taken of it to introduce the Surrey and Medway limes under false pleas by terming them stone, to convey the impression that they had been burned from limestone rock. The rise of the grey lime in public favour was partly due also to the increased facilities of carriage, by means of which the better limes were able to compete with the fat limes which had been hitherto more readily obtained around London. Whatever may have been the reason for this preference, practical builders doubtless soon found that the grey chalk lime yielded a far better mortar, and would set harder with more sand than that made from the white chalk and pure lime; but "Dorking stone-lime" contains to this day a favourite piece of specification-idiom. The natural cement stones of the neighbourhood of London were discovered by Dr. Parker, and specified for cement-making by Messrs. Wyatt and Parker in 1796. They patented the mode of making what was called "Roman cement" by means of calcining the septaria or masses of nodular limestone found in the London clay. In course of time it became known that very similar results could be obtained by combining mixtures of clay and lime or chalk mechanically, and artificial cements, such as those of Vicat and Pasley became largely employed. This manufacture paved the way for Aspdin with his Portland cement, patented in 1824; but it was not till 1847 or thereabouts that the manufacture of Portland cement was perfected, and that what we now regard as Portland cement was made use of upon any scale. Thus much for the history of cements. We will now inquire into one mode of using these cements, and glance at the extent to which they have supplanted lime. This may, perhaps, enable us to ascertain the causes of our failures, and properly to appreciate the advantages we should gain from the more extended use of cements. I am going to maintain that in good Portland cement we possess the best building material of the day, infinitely better than half the rubbish we make our houses of or pave our streets with, and a hundredfold superior when used as mortar than the compound we still go on specifying, as if we knew no more than did our grandfathers of the properties of limes and cements. So firmly convinced am I that lime, as now employed, will become obsolete, or nearly so, that I speak out boldly. Let me be clearly understood with respect to the meaning of the term "cement." By it is implied a substance which, when treated with water, will set or indurate without change of form. Limes of every variety show more or less energy in alteration of physical condition when water is poured over them. Pure limes, such as those made from Carrara marble or white chalk, instantly unite with the water, becoming "hydrated," expand to two or three times their bulk, and develop intense heat, falling to a powder. Very hydraulic limes, under the influence of water, show at first hardly any sign of action; they are termed by builders very "dead," and only after the lapse of hours, or even days, crumble into coarse, gritty fragments. Such limes, if ground or mechanically reduced to an impalpable powder, may solidify without heat or apparent expansion, and acquire a set of the same nature as Portland cement. These limes are true natural cements. Between the active pure limes and the natural cements are an infinity of hydraulic or partially hydraulic limes, some of which, viz., those of a dangerous type, will at first set under water, as the term implies, or, in air, and gradually fall to pieces, while others, on the contrary, will at first crumble to a fine powder, which powder, however, on being worked up with more water will set after the manner of cement. Limes of this kind are termed by Vicat "intermediate limes." The eminently hydraulic limes of the Lias formation, which are ground and sold as "lias cements," are natural cements of the former class, while all argillaceous limes which will go abroad when treated with water, and subsequently set when made up with sand, belong to the latter class. Portland cement, which is of the very highest quality when properly made, sometimes, owing to defects in its manufacture, presents more the characteristics of an intermediate lime than those of a true cement. Although its manufacture has now been brought to great perfection, Portland cement is not wholly free from fluctuations in composition, which in former time brought great discredit upon the material, and which, during the early days of its employment, caused it to suffer by contrast even with Roman cement. Our next consideration must be the cause of cement action. Why do some lines swell up and fall to pieces when treated with water, while others remain wholly inert? The cause of hydraulicity was to some extent explained by Smeaton, who found, by exposing the Aherthaw lime to the action of acid, that he obtained a residue of clay, and that all good "water limes" examined by him left this residue, while pure limes, which were devoid of hydraulic properties, were entirely dissolved. He rightly attributed this peculiar action to the presence of the clay, but did not know the reason of this action. It remained to Sassure to announce that this property depended solely upon the presence of the clay, while Descotils, in 1813, pointed out that the phenomenon was caused by the presence of a large quantity of silicious matter, disseminated in very fine particles throughout the texture of the mineral. The chemistry of the action of cements, and the formation of silicates in the kiln, which silicates become hydrated, and rearrange themselves, in consequence of the difference of their affinities, in the presence of the water, was first thoroughly explained by John, and the theory was perfected by Fuchs, of Munich. The study of this branch of the subject can be further pursued in the essay on Lime in Knapp's "Technology." Although this action is mainly a chemical one, it can be greatly influenced by purely physical causes. The avidity of quick-lime for water is one of the strongest we know of, and the rapidity of the combination of the lime causes so much warmth to be evolved that the particles are immediately raised to a red heat. Conflagrations often occur from what is termed the "slaking" of lime. Now, let quick-lime be reduced to powder in a pestle and mortar, and let this powder be tightly rammed into a hollow cylinder, perforated with minute holes, and fitted with screw caps, to close the ends. On placing this lime cylinder in water, the moisture can only reach the inclosed quick-lime very gradually, and in very small quantities. The result is that, instead of slaking to a powder the lime is converted by its hydration into a very hard and solid mass, as different as can well be imagined from ordinary slaked lime. Some chemists have thought that in the case of mixtures of limes and silicates, *i.e.*, in those limes which are more or less hydraulic, the particles of quick-lime being coated over with an envelope of silicious matter, the water is only permitted to approach the lime very gradually, as in the case of the cylinder experiment. A German chemist has propounded the theory to explain the peculiar action of General Scott's or selenitic cement. These chemical considerations will enable us better to appreciate the action of cements, and to sum up briefly, the facts arrived at are these:—Pure limes, which after falling into a powder are made up into a paste and mixed with sand, yield mortars which have no inherent setting power, and can only become indurated by the slow and gradual recombination with carbonic acid. This re-formation of the carbonate can only proceed where atmospheric air or water charged with carbonic acid gas can penetrate, and the centres of thick walls, even after the lapse of centuries, are often found with the mortar in the state of putty, as when first used. Cements, on the contrary, owe but little to the atmosphere; indeed, true cements indurate better beneath the water than in the air. They possess in themselves the power of solidifying, and attain their greatest strength in a few years at the most. How long cements continue to harden is a question not finally settled; cements vary so much in this respect that the time differs in almost every example, according to the composition and the degree of firing. Cements of the Roman type stand at one end of the scale, many of them attaining their full degree of hardness or tensile strength in from 20 to 30 days; whereas dense well made Portland cement of the highest quality would seem, from Mr. Grant's experiments, to continue to improve for seven years, and these constitute the other extreme of the scale. In speaking of cements, I have purposely avoided mention of that class of substances which, when added to rich or fat limes, impart to them hydraulic properties. These materials are puzzuolana, trass, arenes or volcanic sand, and many kinds of calcined argillaceous earth. All these substances owe their influence as mortars to the soluble or gelatinous silica contained in them. Mortars compounded with pure lime, and a sufficient quantity of substances capable of converting them into cements, become, for the purposes of argument, equivalent to cement-mortars. Unfortunately, however, these mortars are rarely employed, except by engineers, for docks, foundations, and other similar purposes where the solvent action of water is dreaded. Occasionally, when, owing to the difficulty of obtaining good sand, the builder employs with fat limes, burnt ballast, or broken bricks, which are artificial puzzolani, a mortar which sets surprisingly hard is obtained. Such good mortars are exceptional, and their excellence is due only to the action of the aggregate, and not in any way to the quality of the lime. I now propose to place before you the arguments in favour of employing cements instead of lime, for mortar-making. First, cements will unite much larger quantities of sand and building materials into a homogeneous mass than limes, and they are, therefore, more economical to use than limes. The plea of economy is one of the very strongest arguments of the present day, and, therefore, though not the best argument, it is placed foremost. Rather than take the price-book values of lime cement and sand, and with them construct an imaginary set of tables to show how the prices would work out, I will avail myself of the admirable series of experiments recorded by Mr. Colson in a paper presented to the Institution of Civil Engineers in 1878, and published in Vol. 54 of their *Transactions*, for he has, with painstaking care and accuracy, not only given us the cost of different mortars, but also the actual strength of each mixture. "The object of these experiments," he tells us, "was to ascertain what proportion of Portland cement and sand would produce a mortar equal in strength, and as convenient to work, as grey lime mortar, mixed in the proportions ordinarily adopted for constructive purposes. The mortar in each case was mixed to a workable consistency, equal, in fact, to the condition to which it could be used in the work. The testing was carried out by means of briquettes, similar to those used in ascertaining the strength of Portland cement, having a neck of 1½ square inch, equal to a sectional area of 2¼ square inches. The mortars remained in the moulds until sufficiently hard to admit of removal. At the expiration of six months the blocks were treated for tensile strength. . . . . With respect to the samples of common lime mortar, the induration, or chemical set, had penetrated only to the extent of ⅛ to 3-16ths of an inch, but in the majority of cases only ⅛in. The remainder of the area of the fracture had only dried, and could be crushed in the hand without any great exertion of force. The cement mortar with 6, 8, and 10 parts of sand, was of such a raw, harsh character, that it would be practically impossible to use it in a satisfactory manner. In order, therefore, to render it more convenient for working, a small quantity of lime or yellow loam was added, thus rendering the mortar more plastic and tenacious. . . . The result of further experiments showed that the addition of lime and loam reduces the initial strength of cement-mortar considerably; the reduction due to the addition of loam being more marked than by the addition of lime. The quantity of unslaked lime or loam—1-12th the bulk of the sand—was found to be as small a proportion as could be used to give the necessary tenacity." Mr. Colson gives the results in the following table:—

COMPARATIVE STRENGTH OF GREY LIME AND PORTLAND CEMENT MORTAR, ALSO PORTLAND CEMENT MORTAR WITH THE ADDITION OF LIME AND MORTAR.

No.	No. of tests.	Proportions.				Breaking strain on 2·25 sq. in. in lbs.	Breaking weight per sq. in. in lbs.	Ratio as compared with lime mortar.	Ratio as compared with cement mortar.	Remarks.
		Sand.	Cement.	Lime.	Water.					
1	17	2·00	...	1·00	1·33	61·06	27·13	...	...	Three samples.
2	27	2 00	...	1·00	1·33	106·07	47·09	...	...	Grey lime.
3	27	2·00	...	1·00	1·33	82·00	36·44	...	...	Water includes that required for slaking lime.
1	15	6·00	1·00	...	1·25	233·53	103·79	2·81 to 1	...	Cement taken from bulk in store.
2	20	8·00	1·00	...	1·66	154·80	68·80	1·86 to 1	...	
3	35	10·00	1·00	...	2·00	112·88	50·16	1·36 to 1	...	
1	70	6 00	1·00	0·50	1·50	165·31	73·47	2·00 to 1	0·70 to 1	Water includes that required for slaking lime.
2	74	8·00	1·00	0·66	2·00	132·62	58·94	1·60 to 1	0.85 to 1	
3	85	10·00	1·00	0·83	2·50	95·27	42·34	1·14 to 1	0·84 to 1	
				Loam.						
1	21	6·00	1·00	0 50	1·00	136·80	60·80	1·64 to 1	0·58 to 1	Yellow loam, fresh dug, and rather damp.
2	25	8·00	1·00	0·66	1·33	86·48	38·43	1·04 to 1	0·55 to 1	
3	19	10·00	1·00	0·83	2·00	64·50	28·66	0·77 to 1	0·57 to 1	

Mr. Colson tells us that the experiments made with these mortars in brick joints "were not altogether satisfactory, inasmuch as the appliances at hand were not sufficiently accurate and delicate to justify a ratio of comparison. It may, however, be stated, that the general result went to prove that the adhesive power of mortar mixed in the proportions of 8 of sand to 1 of cement, with the addition of loam, was superior to grey lime mortar mixed in the proportion of 2 of sand to 1 of lime." The second table shows the comparative cost of these different descriptions of mortar. As Mr. Colson points out, such estimates must be received with caution, because difference of locality would exert a great influence upon the cost of production. The following statement is a close approximation to the cost of the several descriptions of mortars; the charge for labour and water, and also the bulk of mortar produced, being in each case the mean results of experiments.

STATEMENT OF COMPARATIVE COST OF MORTARS.

Description.	Proportions in cube yards.				Cost of materials.	Cost of labour and water.	Total cost.	Produce of mortar in cube yards.	Cost per cube yard.
	Portland cement at 45s. 8d. per cube yard.	Grey lime at 14s. 6d. per cube yard.	Loam at 2s. 9d. per cube yard.	Sand at 2s. 9d. per cube yard.	s.	s.	s.	c. yds.	s.
Grey lime mortar	...	1·00	...	2·00	20·00	6·62	26 62	2·25	11·83
Portland cement mortar:									
No. 1.	1·00	...	...	6·00	62·19	6·84	68·23	5·90	11·56
No. 2.	1 00	...	...	8·00	67·69	7·80	75 49	7·60	9·93
No. 3.	1·00	...	...	10·00	73·19	9·57	82·76	9·30	8·88
Portland cement and lime mortar:									
No. 1.	1·00	0·50	...	6·00	69·41	8·68	78·12	6·40	12·20
No. 2.	1·00	0·66	...	8·00	77·27	11·20	88·46	8·25	10·72
No. 3.	1·00	0·83	...	10·00	85·22	13 78	99·00	10·15	9·75
Portland cement and loam mortar:									
No. 1.	1·00	...	0 50	6·00	63·56	6·23	69·79	6 10	11·41
No. 2.	1·00	...	0·66	8·00	69·53	8·05	77·58	7·90	9 82
No. 3.	1·00	...	0·83	10·00	75·47	9·97	85 41	9·75	8·76

The second argument in favour of using cement in lieu of lime, is that cement possesses an inherent chemical set, or power of induration, whereas fat limes can only become indurated either by the slow and gradual influence of the carbonic acid contained in the atmosphere, or in consequence of the materials mixed with it to make the mortar. Cement-mortar has, in itself, everything necessary, in whatever position it may be placed, to become hard; all that it requires is a reasonable amount of moisture. In the centre of walls, in trenches and foundations, and even under water, the induration of cement proceeds steadily until the mass acquires the hardness of stone. Lime mortar, when fat limes are used, soon gets a thin skin of carbonate formed at the surface and joints, and the very formation of this exterior skin or coating presents a formidable obstacle to the interior layers of the mortars. These merely dry into a crumbling porous powder, with little or no strength, and if the air cannot reach them are no harder in a hundred years than in a twelvemonth. Alberti states that he had seen in an old ditch that had been abandoned about 500 years "which was still as moist, well tempered and ripe, that not honey, or the marrow of animals could be more so." On the other hand, a week or two back, while unloading a barge of cement at some works at which the author was engaged in Staffordshire, a sack of Portland fell into the water. It could not be fished up for a day or two, but when recovered it had become converted into a stone-like mass, moulded into the exact form of the sack. It may be said that mortar-joints are not by any means such worthless connections as cement advocates describe them. Even when white chalk, lime, or mountain limestone is used, the crystallisation of the hydrate of lime round the particles of sand presents the appearance of some slight induration. This trifling induration is, however, due to the sand employed in forming the mortar. Lime has the power of slowly attacking silica, even in the form of quartz, and most sands present other bases favourable to the formation of compound silicates. And when a sufficient quantity of substances like puzzolana are mingled with the lime we get a cementation differing but little from that of true cements. It had been supposed that it might be cheaper and more convenient to form cement by compounding a mortar of a fat lime with the requisite quantity of calcined silicious clay; but this plan, after having been tried on the Continent, has been abandoned in favour of the mode patented by Vicat and St. Leger, of making an artificial hydraulic lime from a mixture of chalk and clay. This manufacture is still carried on upon a considerable scale round Paris. It cannot be said that in England we have taken to heart the lessons we have learnt, and the unscientific use of lime burned from the hard limestones of the north of England, and from the white chalk in our southern and eastern counties still continues unchecked.

(*To be continued.*)

OLD TAPESTRY FROM ST. MARY'S, COVENTRY.

A MOST important and interesting example of tapestry is now to be seen in the room of the Society of Antiquaries at Burlington House, open to fellows of the society and their friends. It is the well-known tapestry from St. Mary's Hall, Coventry, and has been sent to London to clean and repair. Nothing can surpass the design and colour of this artistic piece of weaving, while its good state of preservation adds much to its value as one of the finest woven pictures we possess in this country, second only, perhaps, to the Hampton Court tapestries, and, of course, in age, to the famous Bayeaux tapestry, the latter of which, the work of Queen Matilda, is a comparatively rude production. The tapestry of St. Mary's Hall is 30ft. long by 10ft. deep, and filled the space under the large north window of the hall, a window of very short proportion, and there is no doubt the tapestry was expressly weaved for this space. This assumption is supported by the fact that the framework dividing the subjects corresponds with the window mullions. In the *Archæologia*, Vol. XXXVI., in a paper by Mr. George Scharf, junr., F.S.A., an elaborate description is given of this work, from which we find that several conjectures exist as to the subjects represented. It would seem to have been wrought at the close of the 15th or beginning of the 16th century, and, according to Mr. Scharf, the scenes portrayed represent Henry VI. and his Queen being admitted as brother and sister to the guild. From this opinion Mr. John Gough Nicholls dissents, in a short paper following that of Mr. Scharf's, where he inclines to the view that the figures in the principal lower compartments represent Henry VII and his queen, great benefactors of Coventry, being admitted as members of the guild in 1499, and it is thought with some reason that this date agrees better with the fashion and costumes. Mr. Scharf, on the other hand, points to strong evidence for proving it to represent Henry VI. and queen, one of the chief difficulties being the colours of the roses in the border, which are Lancastrian in form.

Without attempting to solve this question, we may here simply describe the tapestry. It is divided into six compartments, the two centre ones being rather smaller. The central compartment below, between the chief groups, represents the glorification of the Virgin Mary. She is drawn as a full-length figure, with her hands in prayerful attitute, having on a rich embroidered dress of the pineapple pattern, with blue mantle over. Her hair is long and dishevelled, and her feet rest on the shoulders of an angel who holds the crescent moon. Above her head are four angels in the air, while, on on either side, six Apostles kneel. In the main compartment on the left-hand are seen Henry VI. and his Court before an open book, over which is an arched crown crocketed and jewelled. Behind him is a figure with a beard, another representing a cardinal, either Cardinal Beaufort or Morton, and several other personages, while on the corresponding side is the queen and her retinue, also taking a declaration or oath. Above in the centre over the glorification, is a figure of Justice, which Mr. Scharf thinks has been put over or substituted for an original figure of Christ in full robes. The larger compartments on each side contain groups of patron saints, male on one side and female on the other. The framework itself is interesting; it consists of small pillars with lozenge-shaped pattern on the shafts, with caps, out of which springs a small bracket or cusped curve joining the horizontal division. It is certainly German in design. The pattern of the diaper in the background, which is blue, and the drawing and colour of the draperies are in an excellent state; the composition itself is marked by a degree of refinement, and every figure is a portrait. Coventry was always distinguished for its textiles, and St. Mary's Hall, commenced in 1394 and finished in 1414, is well known to the architect and antiquary, not only for the tapestry, but its fine roof. All admirers of woven fabrics in London have now an opportunity of inspecting a particularly fine example, interesting, both on account of the historic incident it records, and also for the design and workmanship. We understand it will shortly be exhibited at the South Kensington Museum.

MR. H. H. STATHAM ON ORNAMENTAL DESIGN.

LAST week, in Queen-street Hall, Edinburgh, Mr. Henry Heathcote Statham delivered his second lecture under the auspices of the Philosophical Institution—the subject in this instance being "Ornamental Design." Defining ornament as whatever design was applied to any object to give additional interest, beauty, or expression to that object, but which design would not be classed as art by itself, the lecturer proceeded to divide it into two classes, called respectively natural and abstract ornament. Natural ornament he described as consisting in the imitation, more or less faithful, of forms in nature; abstract ornament as consisting in what might be called a metaphysical imitation of nature—the adoption, for instance, of regular repetition of geometrical or other forms. Abstract ornament, again, he said, might be considered under two subdivisions—that which was geometrical, and that which dealt with the repetition of objects or forms. The Greek fret was referred to as a typical specimen of the former, its design being that of a square broken up so as to engage the eye. Celtic ornament, consisting of interlacing bands, was on the same principle giving the eye a certain puzzle to unravel. So also were some forms of Saracenic ornament. The other form of abstract ornament in some points touched very closely on nature, in some other points very closely on the use of merely artificial forms. In illustration of this, reference was made to an ornament produced by repetition of a form which might have been derived from the fir cone; and it was shown how this might be enriched by making the forms alternately larger and smaller, or by introducing a central form, and so obtaining something like the so-called honeysuckle ornament. This latter device, the lecturer remarked, had nothing to do with nature, but was a general ornamental expression of what was a principle in nature, that, namely, of growth from a centre to each side. Passing on to consider ornament in its application, Mr. Statham divided it into functional and superficial. By superficial ornament, he meant ornament simply employed to diversify and give interest to an expanse of surface, which would otherwise be plain; by functional ornament, he meant ornament applied in such a way as to give emphasis to the important parts of the object, or to its use, or to its construction. An example of the latter kind was to be seen in the mouldings and rolls of the base of a Corinthian column, which gave weight and strength at a point where it was wanted. As to the principles upon which those two classes of ornament should be used, in the case of the superficial class there were some very simple kinds of ornament which might be applied to a surface without much consideration; but when one came to anything in which there was thought or drawing, then logic and good taste required that the form of the object should be suited to the form and boundary lines of the surface on which it was placed. By way of illustration, the lecturer compared the design of a Japanese plate, which, he said, was splashed, not ornamented, with that of a Persian plate, where the several parts were specialised by the ornament; as were also shown to be, by functional ornament, the rim and other important parts of a vase. Another point insisted on was that the Greek style of the ornament must have reference to the material in which it was executed; and must not in any way contradict the character of that material. This was illustrated by some good examples of Arabian ornament. After further remarking that value in emphasising construction belonged especially to functional ornament, Mr. Statham next called attention to a form of ornament which consisted not so much in the application of any design, as in a decorative way of constructing the object; and, as an example of this, he referred to an old Greek vase, beautifully adapted for being held with both hands in drinking, and, when not in use, being made to stand upon its rim. Having adduced in this connection several other specimens of good and bad design, and having alluded to what he styled artificial ornament as entirely bad, he went on to speak of the relation of natural ornament to nature. Looking, he said, at Greek natural ornament, one always found that, in adapting nature, they preserved also a sense of geometrical fitness; all the curves arose out of each other. When the Romans applied the same kind of thing, they made a cabbage-like curve, which was not nature, and had not the refinement of art. In the Cinque Cento, there came in a kind of foliage prettier than the Roman, and with a good deal of the quality of the Greek, but marred by the introduction of heterogeneous objects. In taking up fresh natural types, the question was how to imitate them, and that depended on the material, the composition of the ornament, and the use to be made of it. Here Mr. Statham referred his audience to a set of drawings, copies of which had been placed in their hands on entering, and pointed out how the same natural forms might be applied to various ornamental purposes. He urged the desirableness of endeavouring in this way to devise original ornament, instead of continually repeating old forms, and concluded with a plea for the cultivation of the æsthetic perceptions as a most valuable adjunct to the serious business of life.

RAIN-WATER DRAINAGE.

SOME time ago we referred to the desirability of constructing rain-water tanks to each house, instead of allowing the water to overcharge the sewers and drains. The recent rains have shown the necessity of provision of this kind, and many houses in Lambeth have been flooded with water, which might have been collected from their own roofs. If it is impossible for every house to have its own tank, the water might be collected at intervals in suitable reservoirs, constructed so that the inhabitants, or those engaged in watering roads or flushing sewers, could conveniently use them. Another advantage to be secured by such a system would be the reduction of the rates now levied for these purposes, and we believe if it were generally adopted, the rate would soon cease altogether, and the householders and the public, instead of the water companies, would reap the benefit.

Another consideration of some importance is that the cost of irrigation and the purchase of land would be lessened, by storing the rain-water and so diminishing the quantity of sewage to be discharged. It would not only allow of the sewers being made smaller, but the area of irrigation would be reduced also. Many have urged against the separate system of drainage, the cost entailed by having a separate set of sewers, but these objections are too trivial to be placed against the advantages we have mentioned. Special rain-water drains, which might be mere surface drains about 2ft. below the surface of ground, would be laid along the streets connected with the gullies and rain-water pipes from the houses. For this purpose 3in. or 4in. pipes would be sufficient, the cost of which would be but trifling. Great relief would be felt by all low-lying districts such as those on the south side of the Thames, in the rainy season, as the sewers, which have now more than their work put upon them, would be relieved of surplus water, and we should hear less often of basements flooded, not with rain-water only, but diluted sewage matter, "back water" as it is called. The Metropolitan Board ought to gladly set about this reform in the interests of their sewers.

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The town council of Glasgow accepted on Monday tenders amounting to £9,521 4s. 10d. for the erection of new public baths and washhouses at North Woodside, to be built from the designs of Mr. Carrick, city surveyor.

The town council of the City of Cork, at their meeting on Monday, the 22nd, elected Mr. M. J. McMullen, B.E., Member of the Institute of Civil Engineers, Ireland, as city engineer. Eleven candidates presented themselves for election, seven of whom, including Mr. McMullen, passed the test examination required by the council.

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ILLUSTRATIONS.

SAINT ALBAN'S ABBEY, THE NEW WEST FRONT.—DESIGN OF A PAINTED CEILING—ALL SAINTS' CHURCH, BRANKSOME: PROPOSED ADDITIONS.—NEW BOARD OF TRADE OFFICES, CARDIFF.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE NEW WEST FRONT OF ST. ALBAN'S.

For description see p. 627.

A PAINTED CEILING IN THE JAPANNED ROOM IN THE QUEEN'S HOUSE.

This double-page plate, illustrating a painted ceiling by Robert Adam, architect, is reproduced from the celebrated "Works in Architecture," published between 1778 and 1822, by the talented Brothers Robert and James Adam, of the Adelphi, and we have chosen our plate from the volume of reproductions which has just been published by Mr. Batsford.* Twenty-six plates comprise the selection before us, and these may be fairly said to embody well-nigh all that is now of value in the work as at first published, although really they represent only about a fourth of the original number of plates. The remainder consist chiefly of external elevations and details, with general plans of not much interest to the practical designer; indeed, the Adams style is chiefly worthy of admiration for its treatment of interior decoration and plasterwork, and not for the plans or exterior façades which the architects who originated the style designed. The most important public building which they erected was the College at Edinburgh, and certainly none of their designs were, on the whole, nearly so satisfactory as that prominent example. Of country-houses, Keddlestone Hall, in Derbyshire, was their most successful production, though of this Dr. Johnson said, "It would do excellently well for a Town Hall." In London several of the houses in the Adelphi remain still, exhibiting some interesting examples of interior work in the Adams style, and two sides of Fitzroy-square, Portland-place, and Finsbury-square also exist to show the characteristics of the style and the peculiar mode of fenestration introduced by these architects. Sir Watkin William Wynn's house in St. James's-square may be taken as a very good example of an ordinary street-front by the Brothers Adam, and it here forms the first plate in Mr. Batsford's book, the beautiful ceilings of the library, music-room, and Lady Wynn's dressing-room being well illustrated in the three following sheets. Lord Derby's house, in Grosvenor-square, shows a grander style of treatment in the view given of the drawing-room, where the ceiling is vaulted and elaborately enriched. The next five plates give sections of the second drawing-room, the ceiling of Lady Derby's dressing-room, and several fireplaces from the same building, while the final plate of this section includes a series of girandoles, curtain cornices, doors, and furniture. Plate XI. shows the library at Kenwood, Lord Mansfield's house, and is a very interesting sheet, as also is the next, which gives a plan of the ceiling to the same apartment, and shows a barrel vault, having an apsidal termination at each end. The dining-room sideboard and pier-glasses are also of interest, even if not adapted for imitation in a literal sense now. Sion House, the seat of the Duke of Northumberland, furnishes five sheets, which are chiefly confined to the illustration of the library, with its recessed bookcases and elaborately pilastered walls. The ceiling is less distinctively "Adam" in character than some of the designs, though possessing all the freedom of the style which, of course, was essentially original if not classically pure. Plates 19, 20, and 21 show various pieces of furniture, designed for Lord Bute and others, and plate 22 is the one which we have illustrated to-day. This ceiling is equal to any in the book, and seems to commend itself in every way to the purposes and position for which it was designed. The chimney-pieces from St. James's Palace, on the next sheet, are also admirable; while the sedan chair, as executed for the Queen (1773), though out of date as a means of conveyance, suggests much that is worthy of imitation for modern furniture enrichment. The same remark applies of the harpsichord on plate 25, though we do not admire the standards or Imperial ornament in the centre. The upper part is, however, far more to the purpose than the style usually now chosen for our pianofortes and furniture. The book closes with Lady Bute's dressing-room ceiling, which is a typical, though less elaborated, design than some before mentioned, and for this very reason will probably be more valued and suggestive. We commend Mr. Batsford's collection of plates to our readers, as they are well chosen, and, we think, cannot fail to be appreciated. The illustrations have been reproduced by photolithography, by Mr. James Akerman, in a clear and bright manner, so that all the engravings are equal to the originals, while the book is both well printed and well-bound.

ALL SAINTS' CHURCH, BRANKSOME.

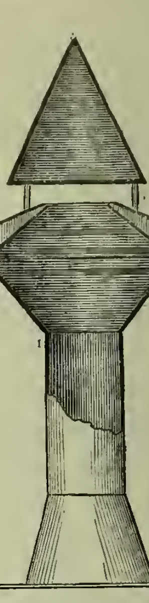
This church, which was built a few years back, stands in one of the prettiest parts of Branksome, a suburb of the now celebrated watering-place Bournemouth. The neighbourhood, rapidly increasing, will soon demand more church accommodation, and the design for the proposed additions, shown by the drawing we publish this week, was made at the request of the former vicar of the church; for the present, however, the matter is in abeyance. The architects are Mr. Cole A. Adams and Mr. H. P. Horner.

NEW OFFICES FOR TELEGRAPHS AND MERCANTILE MARINE (BOARD OF TRADE), CARDIFF.

The offices illustrated this week are to be devoted to the use of the Postal Telegraph Service, and the Mercantile Marine Department of the Board of Trade, and are situated near the Bute Docks, Cardiff. The accommodation is as follows:—Telegraph Office: On the ground-floor, to the front, is the public office, 37ft. 6in. by 28ft. Towards the rear are the messengers' room, battery and lineman's room, store-rooms, and sanitary offices; on the first floor are the engineer's office, and retiring-rooms for the staff of female clerks; on the second floor is the instrument-room, 52ft. by 38ft. Mercantile Marine Office: On the ground-floor are the discharge office, 31ft. by 30ft.; engagement office, 40ft. by 26ft.; together with superintendent's and clerks' rooms, and waiting-rooms for seamen and officers of the out-door staff. On the first-floor are two large examination-rooms, general office, and tonnage office, together with effects, and store-rooms in the rear. The second-floor will be devoted to the use of the care-taker, and for storage purposes. Provision has been made in the discharge office for the wives of seamen attending to cash pay-notes. The building materials are as follows:—For the walling, local red bricks have been used; for the dressings, cornices, &c., shalk stone (a deep red sandstone), from near Carlisle; and for the columns and pilasters, Penrhyn granite. The roofs are covered with Welsh slates. The contractors are Messrs. Kirk and Randall, of Woolwich, by whom the work is being executed in a highly-expeditious and satisfactory manner. The architect is Mr. E. G. Rivers, C.E., of H.M. Office of Works, Whitehall-place, S.W. The work is being carried out under the immediate superintendence of Mr. M. G. Nasmyth.

BOYLE'S PATENT CHIMNEY-COWL.

Messrs. Robert Boyle & Son, of Glasgow and London, have introduced a chimney-cowl which is a modification of their air-pump ventilator, and bids fair to solve that troublesome problem, "How to cure a smoky chimney." In construction it is simple, and the cost very moderate. As will be seen from the accompanying diagram, the cowl is a fixture, having no movable parts about it to clog up, wear down, or get out of order in any way, and is noiseless. Besides creating a powerful up-draught in a sluggish chimney, it is also an effectual preventive of down-draught, as, no matter from what direction the wind may play upon it—upward, horizontal, vertical, or at any angle whatever—the effect is always the same; it will act equally as well surrounded on every side by higher buildings, or placed under a wall or cliff, with the wind swirling down on the top of it, as it will in a position entirely unobstructed. The wind, entering between the two bottom plates at the angle shown, gets compressed at the narrow slot at the top, acting on the same principle as the blowpipe, creating an induced current, and taking the pressure off the top of the vacuum chamber, and is further assisted by the deflected current blowing across the top of the upper plate. The vacuum chamber, which is one of the most essential features of the air-pump ventilator, permits the ascending smoke to expand, and accelerates to a considerable degree the up-draught. The conical top prevents any of the elements passing down, and from the angle at which it is placed, when the wind is beating down on the top of it a strong up-draught is the result instead of a blow-down. It is easily cleaned, there being nothing to obstruct the sweep's brush, or get choked up. It is also applicable for the ventilation of soil-pipes and railway carriages. As a soil-pipe ventilator, Messrs. Boyle affirm it to be the most powerful and cheapest that is at present in existence, and are prepared to prove this by actual test against any other cowl that may be brought forward.



CHIPS.

At a vestry meeting held at Washington, co. Durham, last week, it was decided that the parish-church, which was erected about half a century since, be enlarged in accordance with plans submitted by Messrs. Austin, Johnson, and Hicks, architects, of Newcastle-on-Tyne.

The memorial-stone of a village-club was laid at Holbrook, near Ipswich, last week, by Lady Henniker. It is to be built by, and from the designs of, Mr. Wagstaff, of Freston, in local red brick, will measure 33ft. by 30ft. by 12ft., and will cost £220.

The Slade Professor of Fine Art (Mr. W. B. Richmond, M.A.) will deliver public lectures on Thursday and Friday, December 2 and 3, at 2 p.m., in the museum at Oxford; again on Tuesday and Wednesday, December 7 and 8, in the same place and at the same time. Subject: Michael Angelo in the Sixtine Chapel."

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* The Architecture, Decoration, and Furniture of Robert and James Adam; selected from "Works in Architecture" (published 1778-1822), and photographed from the originals. B. T. Batsford, 52, High Holborn. 1880.

All Saints Branksome.

Proposed Additions.

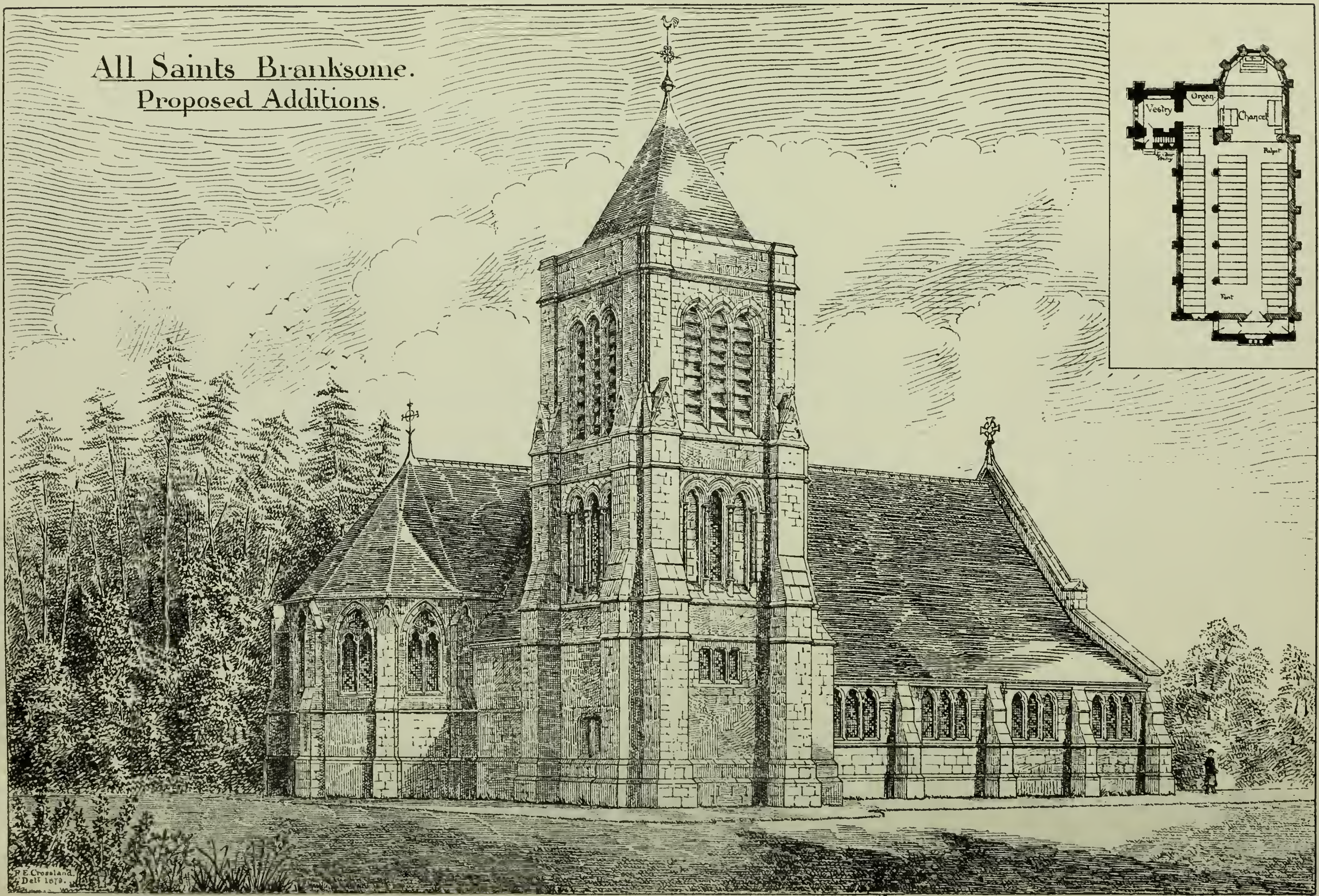

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W C.

Cole A. Adams } Archts
H. P. Horner. }

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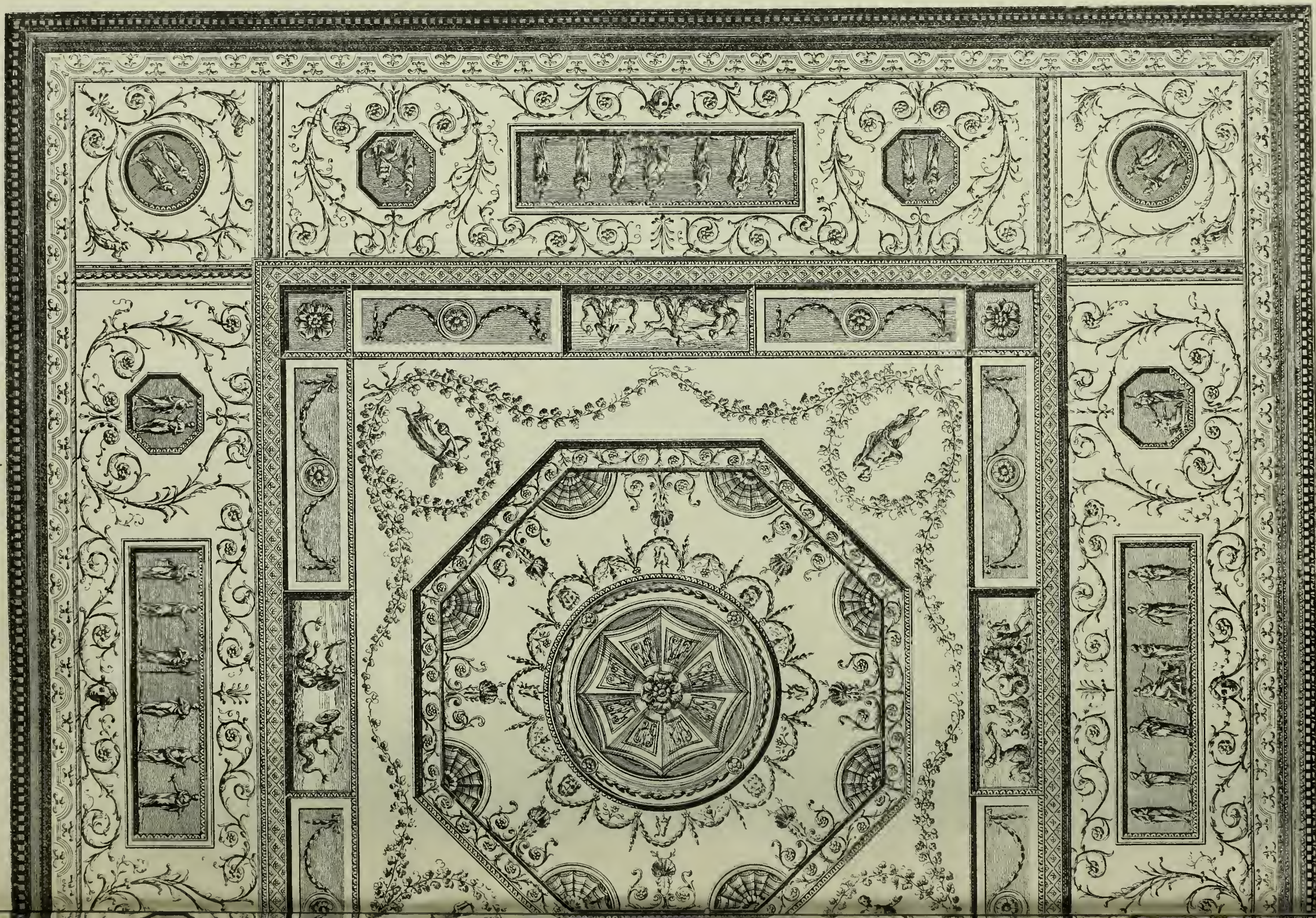
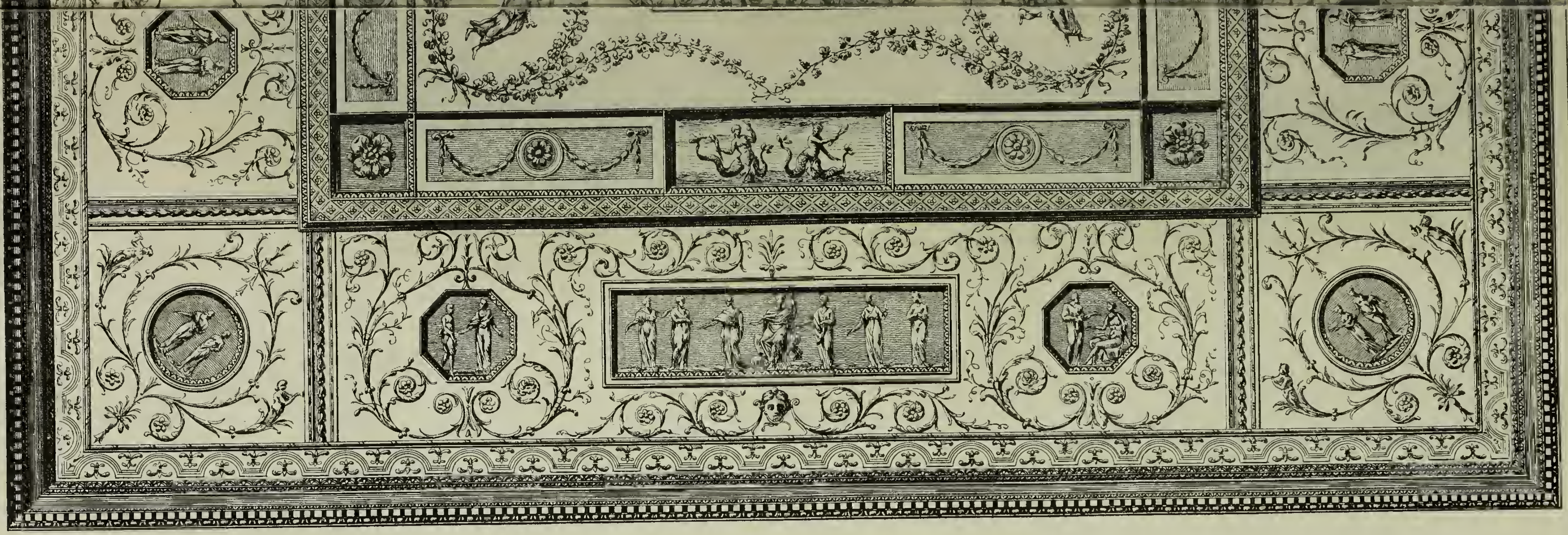
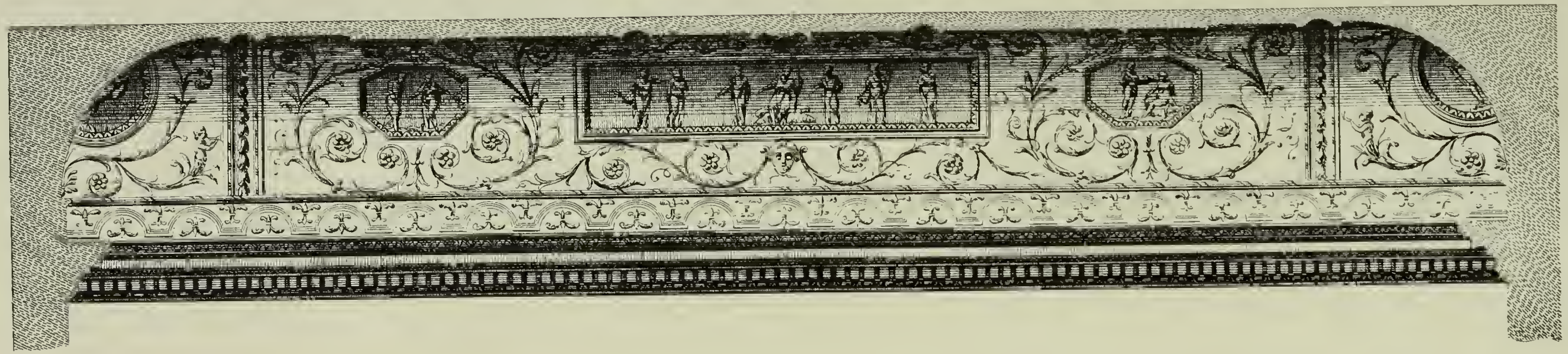




Section which shows the coved part of the Ceiling.



Design of a painted Ceiling executed in the Room called the Japanned Room, in the Queens House.

R. Adam Architect 1762

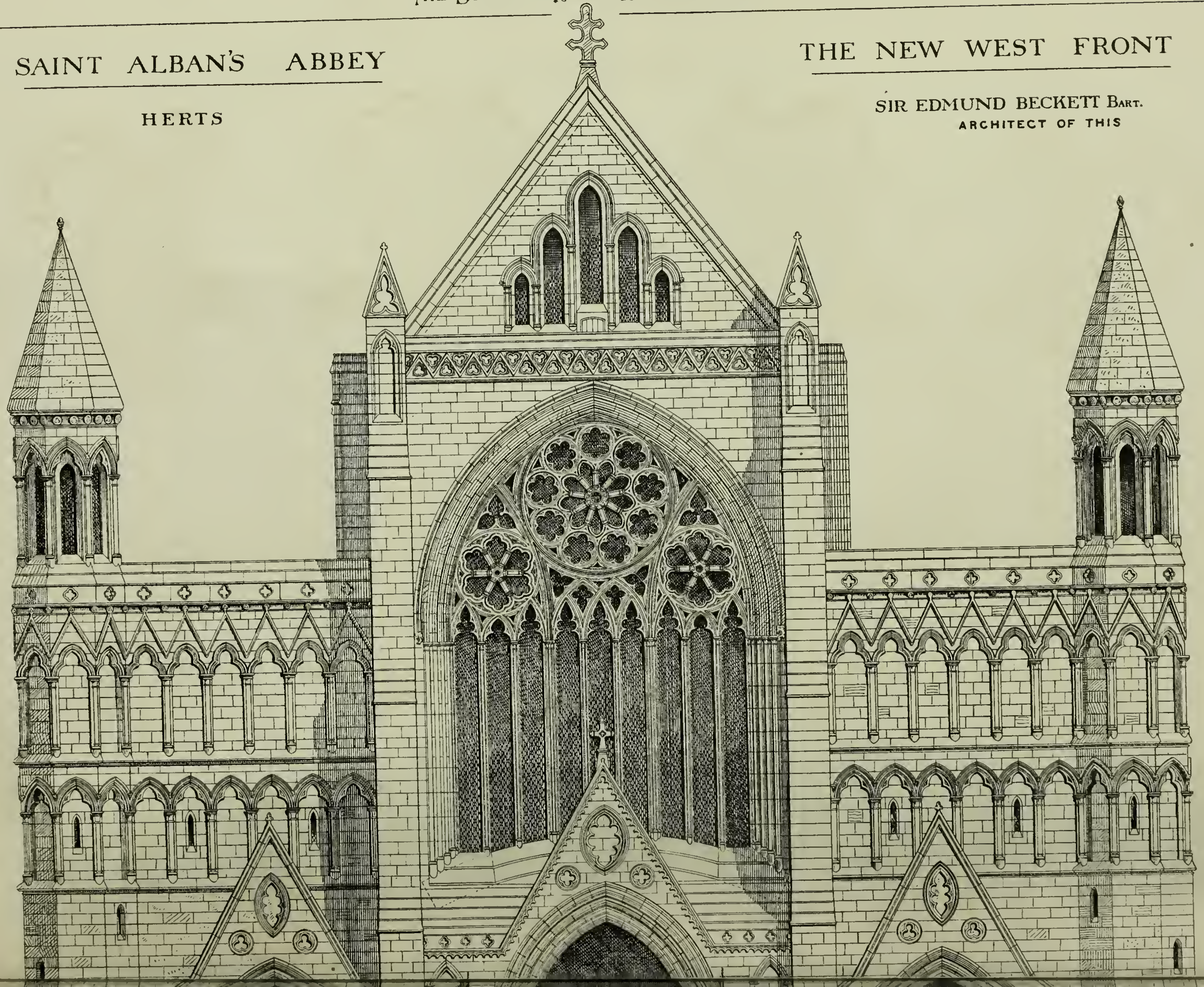
Photo-Lithographed & Printed by James Akerman. 6, Queen Square. W C

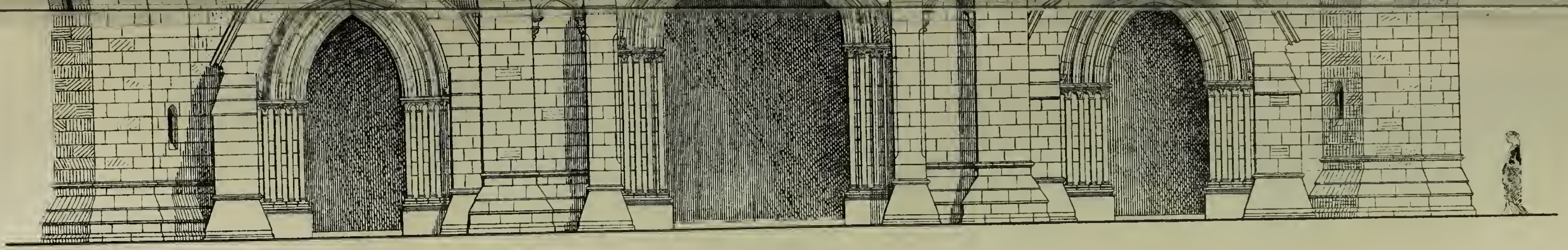
SAINT ALBAN'S ABBEY

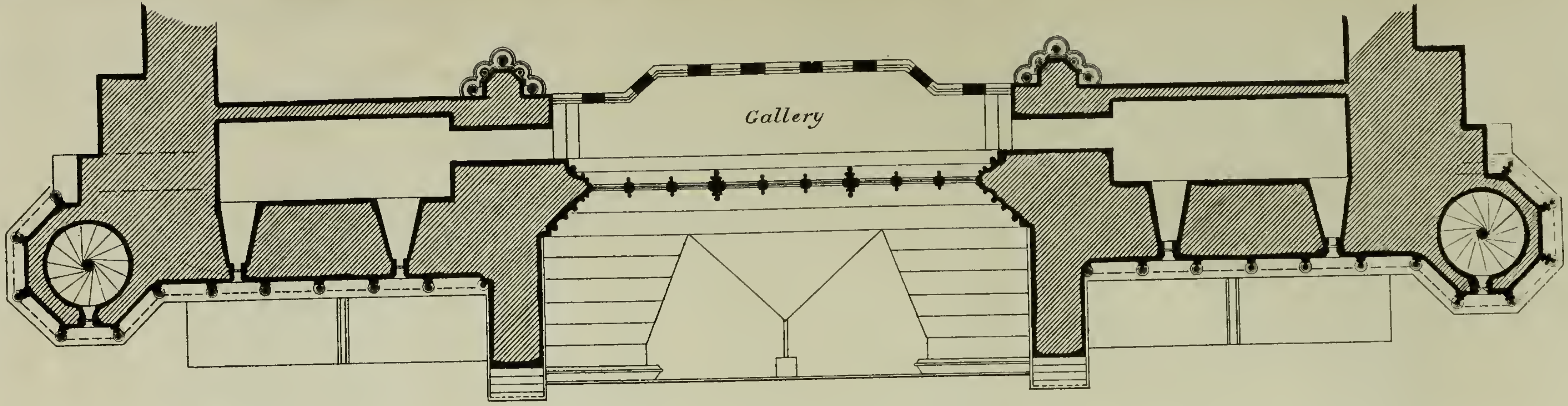
HERTS

THE NEW WEST FRONT

SIR EDMUND BECKETT Bart.
ARCHITECT OF THIS

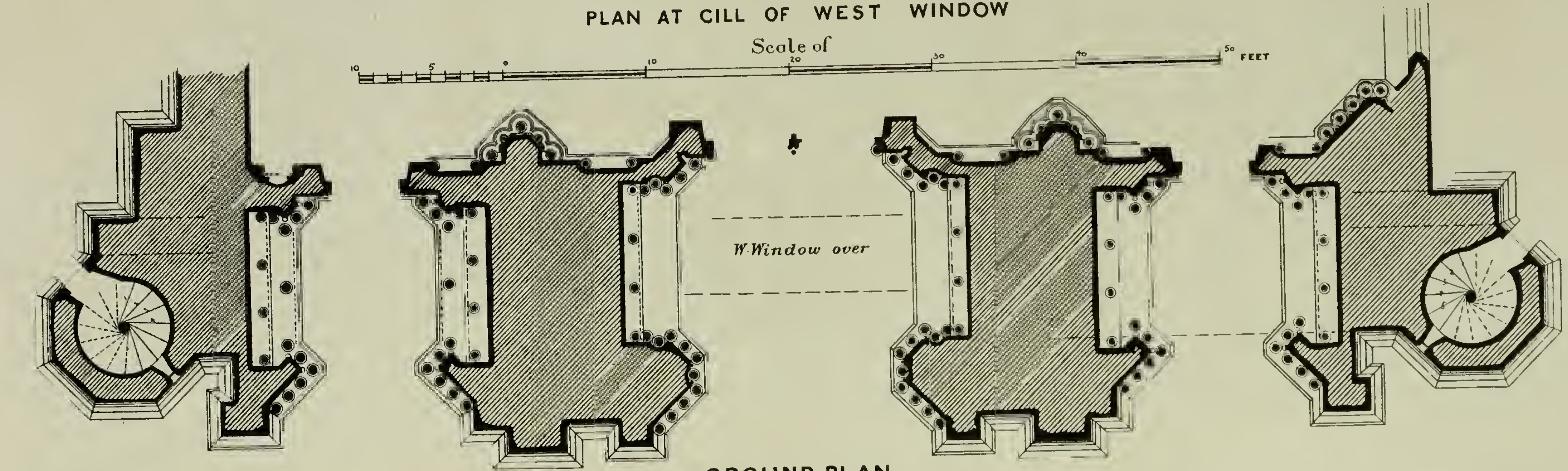






PLAN AT CILL OF WEST WINDOW

Scale of



GROUND PLAN

MAURICE B ADAMS DEL^T

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C

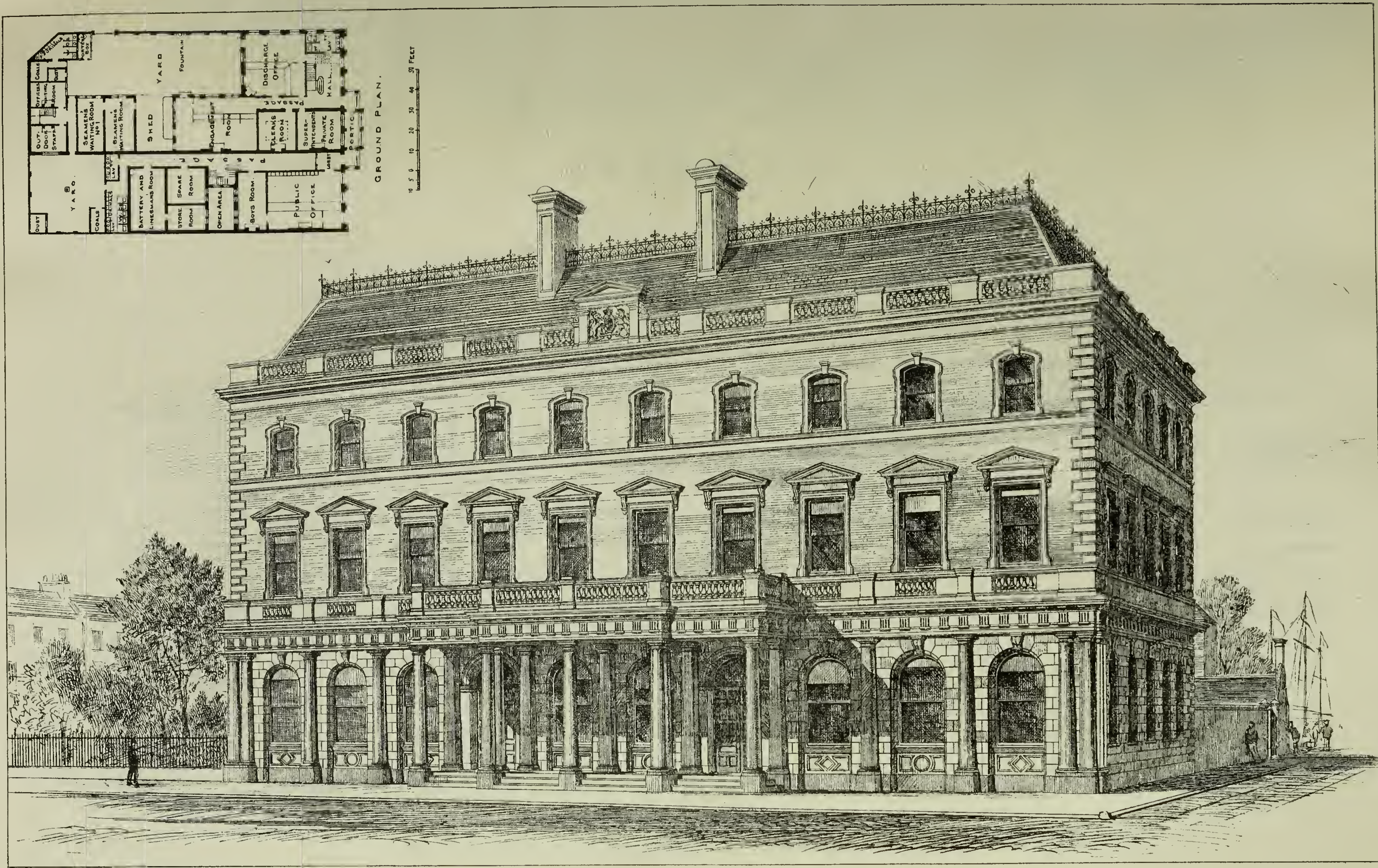


Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

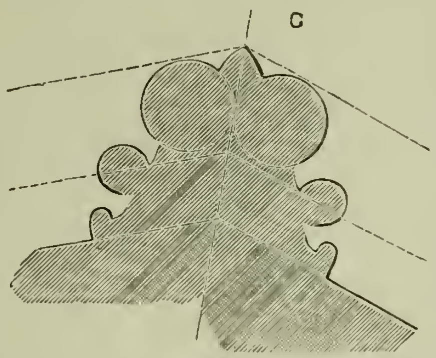
NEW OFFICES FOR TELEGRAPHS AND MERCANTILE MARINE (BOARD OF TRADE). CARDIFF.

E. C. RIVERS ARCHITECT

THE NEW WEST FRONT OF ST. ALBAN'S.

BY Sir Edmund Beckett's permission, we give an elevation, or a full-front view as from a considerable distance, of his design for the new west front of St. Alban's Cathedral, which is now under orders for execution by Messrs. Longmire and Burge, who have done all the late restorations there, and the new rectory, of which we printed elevations and plan last year, also designed by Sir E. Beckett, and given by him and the Ecclesiastical Commissioners. By referring to the copy of Canon Davys's picture of the present west front, in our number of Oct. 22, it will be seen that any restoration must be an invention of everything except the very late Perpendicular window, which has been the subject of a lively controversy in the *Times* lately, as no traces remain of the design of the original Early English front. The window is in such a state of decay that any restoration of it would be only rebuilding a modern copy of what has been pronounced by as high an authority as any in the world, "a very bad specimen of a very bad style." At any rate, Sir E. Beckett, who has become legal master of the position, through the cessation of other subscriptions, and the restoration committee being left, not only without funds, but in considerable debt, has determined not to rebuild it, nor to attempt an imaginary restoration of the unknown Early English design, but to adopt the Early Decorated or Geometrical style, the earliest which would admit of a large window, and which prevails in various parts of the nave and choir and in all the best windows in the church, and which Sir Gilbert Scott always maintained to be the climax of the Gothic styles. The new roof, on the old high-pitch lines, which was the subject of a longer and more violent controversy two years ago, is now completed, but has no gable to finish it, and the present west front is quite incapable of carrying one without entire reconstruction. The wall, which had been thinned considerably when the Perpendicular window was built, is to be thickened again, so that the glass will be $3\frac{1}{4}$ft. deep from the face of the wall. The buttresses also, which were manifestly too small for their work, and cracked in various places, will be greatly increased, to 10ft. by 4ft. in the lowest stage. The new window retains substantially the outline of the present one, and the same number of lights; but the stonework will be much more massive. It is 26ft. wide, or just the same as the celebrated west window of York Minster, which however is taller and somewhat later in style, and has only eight lights. The elevation cannot show that the great gable will be 3ft. behind the face of the wall below it, with a passage and entrance to the roof behind the pierced parapet over the window, as at Winchester, and as it probably was originally here. The buttresses, therefore, do not touch or "stop" the gable, as usual, but stand clear in front of it. The present ones do not reach so high. The central porch gable does not run up into the window, as it necessarily appears to do in an elevation; but, being 12ft. in advance of the glass, will be sloped off behind, like half a pyramid, to let light come through the bottom of the window; and the sill is slightly arched, to make it carry the weight of the window, which now rests on the thin vaulting of the porch. The turrets take the place of the original towers beyond the aisles, of which Canon Davys gave two imaginary restorations (unfortunately to no scale, and much exaggerated in height), one Norman and the other Early English, nothing whatever being known of their design. The arch into the south tower alone remains, of course walled up. It should be mentioned that the working design (a section of which we give below), C, for all the external corner shafts of the turrets contains more members than are shown in the elevation, though the others have only one 5in. shaft in front, but in other respects are the same as this. The turrets will be nearly 90ft. high; the exact height will be fixed by trial with models. The aisle fronts are 56ft. high, and the main gable 100ft. The entire width above the plinths is 105ft., or exactly the same as Salisbury, which however is considerably higher, and of different design, as is well known. Before the west front can be touched, it has been necessary to rebuild about 60ft. of the north aisle wall, with large buttresses to carry flying buttresses to support the clerestory, which was left leaning over 10in. when the opposite clerestory was pulled up 28in. under Sir G. Scott. It is evident that both might have been more easily done together. Now that the roof is on, the north clerestory must remain leaning, which is not of much consequence; but it was also cracking, and requires these supports. A high roof will be built over them, as it was over the restored 100ft. or five bays of the south aisle. Other repairs are visibly needed all along the south aisle, including the Decorated windows and the rest of the roof, which we suppose will be continued as a high one; but on the north side there are windows in the Norman triforium of the nine eastern bays, which it is not thought desirable to obscure by a high roof, and the flat-roof there is new, and in good repair.

Sir E. Beckett has already inserted windows in the four dark bays at the west of each aisle, which Sir G. Scott objected to because there were none before, either while they were impossible by reason of some abbey buildings standing there, or after they had fallen and let down the walls and vaulting, and the walls had been re-built roughly and with no architectural character, like those which close up the west fronts of the aisle, cutting right through the porches. Now that the windows are in, they are universally considered a great improvement. They resemble the others generally, but with small variations of pattern and thicker stonework.



Four or five of the pillars have had to be almost rebuilt, being cracked all over and in a dangerous condition, though they are the youngest pillars in the nave. Besides the new roof the committee have put up a new flat ceiling, of oak panels, like the original ones, of which some ribs were found—not the miserable lime-washed modern imitation of them, which caused so much disturbance until it was taken down and its real character revealed. Remains of it may still be seen used for some workmen's hoarding, and also some specimens of the timbers of the old flat roof, so rotten that it seems a miracle how they escaped falling. It is not likely that the nave can be completed and fitted for service again in much less than three years. But there is daily service in the middle or cathedral part of the church, which contains as large a congregation, and received a good deal of restoration about ten years ago, when the tower was saved from falling very soon, through Mr. Chapple, the clerk of the works, observing the danger. The transept ceilings still have a very suspicious-looking convexity downwards, though they then underwent some repair. The Lady-chapel is also gradually being restored by benevolent individuals undertaking parts of it, especially Mr. H. H. Gibbs, who is now doing the most beautiful part of the arcading. The windows have been restored by ladies in the neighbourhood and the Corporation of London. But there is still a vast deal of absolute ruin to repair, as every bit of ornamental work had been destroyed while the building was used for a school.

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"BUILDING NEWS" DESIGNING CLUB.

REVIEW OF DESIGNS FOR ARTIST'S STUDIO, &c.

WE are glad to see such an overwhelming response to the first subject, and from a general review of the designs, we may congratulate the competitors upon the success of their efforts. Acceding to a suggestion, we shall in future number the first twelve designs in order of merit. It is some satisfaction to place our old member "Jack" first this time, though his plan is not perfect, and there are some points of his design we disapprove of. He is, however, not quite so fidgety in style as he has hitherto been; nevertheless, we should like his work more if he tried to be still less restless in manner. The plan shows study of requirements; the hall leading direct by a side-stairs to the studio above, the little conservatory midway, and the spacious upper landing opposite studio door are good features, while the small room for models leading from the latter, and the general arrangement of domestic part of house with the kitchen and offices, shut off from the hall-entrance, commend themselves to us. The nooked fireplace in drawing-room is quaint; but we should not like to live in the room in winter time; the other recesses and the proximity of kitchen to dining-room are good points. But a point of even greater importance to a studio is the lighting. "Jack" provides sloped and top lights, and obtains light also on two sides, necessities for the painter which we find have been overlooked by many competitors. The size of studio is 30ft. by 19ft. 6in., the materials are brick with tile-hung upper story, and the treatment Old English with mullioned windows. The section of roof showing the sloped lights is not quite satisfactory. (2) "Cui Bono" is a pleasingly-grouped building, with a high pyramidal roof, out of which the studio projects as a gable-structure, though we are at a loss to see the value of the hipped portions, which would be awkward to ceil internally. There is an open-timber verandah over lobby, lavatory, &c. As regards plan there are some defects: the canted passage between hall and kitchen is not good, the dining-room is of bad proportion, and not near the kitchen; but the author is careful to obtain a lofty north window to the studio. We query the lighting of the upper passages to bedrooms. (3) "Veronese" is a well-treated, half-timbered study, with good detail. The studio is 30 by 20, is lighted from the roof, and also by a large bay and end windows. The basement floor is undesirable, and the domestic arrangements and stairs to studio unsatisfactory. The winders and landing are particularly objectionable. (4) "Pupil J" sends a design not wanting in merit. The entrance-hall and stairs to studio are convenient and well-lighted; there is a back-entrance to studio and w.c. at one corner, which is desirable for "models'" use, and a gallery at one end; north light is obtained. The domestic arrangements are passable, but we do not like the one-sided gable, including the drawing-room, bay, and garden-entrance; it is a purposeless projection as shown. There is something quiet, suggestive, and suitable about the elevation of "Fiat" (5), who expresses his studio by a gable and large window in a sensible style; but the kitchen is small and badly placed, the stairs are narrow, and the hall would be nearly dark; the bedrooms are all too small. (6) "Ralph" is also a quiet sensible treatment of brick, though we observe omission of dormers to studio in the perspective sketch; the windows shown are too low for studio requirements, and as regards the plan, in spite of good points, too much domestic comfort is sacrificed to the hall, which is larger than the dining-room, and the relative positions of the latter and kitchen would entail traversing the hall. The studio is placed by the author on the ground-floor, entered from the hall; there is also a back-door and lavatory, and the staircase is made an external feature. A gallery is obtained on the first floor, over hall, but it is too large for a residence of this sort. (7) "Rex" has a good hall and fairly-planned studio, lighted by two north-east bays, and having a good back entrance and landing, but the ground-floor domestic arrangements are defective. Brick and tile-hung upper story are adopted; but the elevation lacks character, and the studio might have been made more a feature. (8) "Edgar" has evidently been inspired by the architecture of Bedford Park, some features of which are reproduced. We cannot commend the plan; the studio is not pronounced, and the entrance is contracted: The balcony is a good feature. (9) "Frank" has a good entrance to the studio; the staircase is made a dignified feature, but the open corner porch is weak, and the offices badly placed. Why should the kitchen-door directly face the hall and staircase? The lighting of studio is not happily managed; but a useful back entrance for models, a lavatory, and easel-room are added at one end. Brick, stucco, and tile are used, and the style has a Jacobean character. (10) "A Bundle of Rue" is a Late Gothic attempt, with well-drawn detail, but not skilfully combined. Here, as in the last, the hall and main stairs to studio are unpleasantly near the kitchen, and the principal rooms are not well arranged. Why a bedroom on the ground-floor? The studio has a large bay window at one end and a gallery above; but the landing is rather cramped, and the lighting not satisfactory. (11) "Motto A" falls below the requirements in the domestic arrangement, the corridor on ground-plan is not economical, the kitchen and offices are cramped, and the dining-room rather awkward in shape. The upper floor and studio are convenient, the model's side-stair, and the conveniences on landing are fairly obtained, but the bedrooms are too small, and the means of lighting studio imperfect. The elevation in Queen Anne is rather too pretentious. (12) In "Black and White" everything is sacrificed to the large hall; the ground-plan covers double the area of many others, owing to the bedrooms having been partly provided for in it. We cannot see how the inner passage is to be lighted. The studio is made a conspicuous feature; it is lighted by a bay window facing east, and there is one north window, but these are inadequate. The balcony shown between dormers is a pleasing addition, and a well-grouped building is shown by the sketch, though extravagant. "Bobby Dalby" is quiet and simple, half-tiled, with fair detail and a high roof, but scarcely suitable. There is a fair-sized hall, but a cramped landing to studio: the winders are objectionable, and the domestic arrangements though tolerably perfect, might be improved; the bedrooms are all small. "Darney," in a kind of mixed Gothic style, has a few good points in plan, such as the recesses, the serving-room, hall, and office arrangements, but the studio entrance at one corner is awkwardly managed, and the lighting and accommodation of studio defective. "Alpha," rather high-pitched, has an ill-digested plan, and the elevation with the flat one-ended bay is clumsily treated; there is also a lack of coherency in the parts of the elevation. The studio has a north and a top light, but the elevations do not show the treatment. "Star in circle" has not made the best of the studio; the details are meagre and not well drawn, though there is a modest quietness in the front elevation. The plan has little to recommend it; the bed-rooms are awkwardly disposed, though the opening for large canvases in studio is a point few have considered. Nor can we say "Black and White" has been more successful in the plan; the domestic part of house falls below the mark, and the studio is not well lighted, nor has it a becoming entrance.

There is a large number of well-drawn designs, which have not carefully considered the domestic arrangements or have followed the ordinary villa type. Some of these are bewildering in plan, others are costly, and not a few of them have neglected to provide the requirements of an artist's studio. "Ephraim," "Puck," "Nam," "Beta," "Tempus Fugit," "I will either make a Shaft or a Bolt of it," "Cove," "Alpha," "Application," "W. in W," "Keapie," "Epergos," "St. John," "T." in circle, "Tom Pinch," and a few others may be mentioned in this class. "Ephraim" has awkwardly disposed his rooms, and the design has a heavy exterior with little characteristic of a studio; "Puck" shows a want of study in his plan, which has no method in its irregularity; yet there is some good detail. "Nam" is ostentatious in style, and the last remark is also true of it; "Beta" is confused, with a singular corner entrance, and the style, though rather fresh, is too fanciful. "Cove" sacrifices unnecessary space to his halls, and the servants would have to cross the hall every time to the dining-room. In "Alpha" we find an expensive and scattered plan, with a grand flight of stairs, but with a poor entrance to studio. "I will either make a shaft," &c., is somewhat better in the studio arrangements; a recess, a balcony, a retiring-room, easels, and conveniences are provided; there is some freshness in the exterior, and the planning is ingenious. "W. in W." also shows a fairly-arranged ground-plan, but the studio entrance is small; the plan "Application" is wanting in study, and is hardly equal to the feeling sketch which accompanies it. There is some merit also in "Keapie's" sketch, though the details and plan do not bear criticism. "St. John," "T" in circles, have also good points in elevation. A very economical plan is that of "Epergos," though the studio is not well lighted. "Timset" is a clever plan, with a well-approached and lighted studio.

There is a still larger number of designs which we may place in a second rank, and which it would be impossible to criticise in detail, but we may point to defects in them. Taking a few of the leading ones first, "Domns" has a little character about it; the central tower rising from the hall is picturesque, and the grouping artistic, but the domestic arrangements are defective, as the positions assigned to the dining-room and kitchen. The studio has two large bay-windows on one side, and a balcony leading from one end. "Hubert's" plan shows capability, but the elevation and details are against it. "Boy Bill," a kind of Venetian Gothic study, is neatly drawn with some good points; "Spero" is piquant and cottage-like, having a studio lighted by two flat bay-windows, with two stairs, but not equal in domestic requirements; "Lancaster" spoils his arrangement by making a bedroom where the dining-room should have been; "Harry" shows a creditable elevation, but the planning admits of improvement; "Endymion," has sent also a pleasing exterior study, Jacobean in style, but the plan is somewhat confused; "Norman" scarcely hits the mark, his domestic planning is rather meagre, and what beauty is there in the ornamental framing to gable? "Snowflake" is pretentious in style, but ill-planned in the private part of house; "Milverton" shows a plan that is rather ingenious in its entrance arrangements, and might have been better; the studio landing is narrow; "Vignette" has awkwardly planned his rooms, and the corner porch is unnecessary, and its roofing not good; studio is hardly well lighted; "Edmund" has the germ of success, the studio is made prominent by large windows, but the details and stupid bays spoil the design; "Arnold" is heavy, and studio ill-lighted, but the work has promise; why take your point of sight above the roofs? "Maltese Cross," Late Gothic, plan of section crude; lighting of studio fairly obtained; "Will," plan not economical, detail meagre; "Ernest" too fantastic, and plan lacks study; "Nil Desperandum" is not good in entrances to rooms, perspective not true; "Kismet" has too large a studio, and the plan is not convenient; "Con" in Circle, perplexing in plan, lacking in method. We have only space left to enumerate others. Some of these display care in drawing, though the detail of many show the need of a little more study of good examples; in others the plans are crude and ill digested, or the studio lighting has been neglected. Pierre, Tweedie, H.C in circle, Ambition, Hexagon in circle, Captain Nemo, Trial, Cygnet, B. J., Gilbertus, K in circle, X.N., Hornet, Subjudice, Idea, have failed from one or the other of these causes. We have also received Harry, F.P. in circle, Cui Bono, H.F., and one or two others which are unsuited or unfinished.

AN OVERMANTEL.

We award the first mark to "G. W. W." for the simplicity of the design, but the drawing is crude and scarcely equal to the occasion. It consists of a bracketed locker, with gilt leaded lights and figure-subjects in the centres; corner shelves are reserved for china, and there is a good space over shelf for glass and ornaments. Details are refined. "Reginald" sends a pretty sketch with bevelled glass mirror in centre and side spaces for china; stamped leather is used as a background, and details are suitable. "Pcr." This is a clever sketch for white and gold, showing two designs: the glass design is the better of the two; the details are rather coarse in the mouldings. "Cui Bono" is more of a fireplace than an overmantel; we like the terra-cotta panel treatment below; the overmantel is simply a bracketed cornice over a bevelled mirror, but it is effective; white, relieved by gold, is proposed. Details are good. "Noah" is too heavy in the pediment and mouldings; "Fidelis," good in detail, is over-bracketed, solid ones would have looked better; "Endymion" is original but rather tawdry. We name the following in the order of their merits: Lex, Tyke, Puck, Lux, Nemo, Motto A, Little Wooden Soldier, Peace, Peter, York, H in circle, Boy Bill, Hubert, H.C in circle, "Con" in circle. Many of the latter designs show mouldings either too heavy or unsuitable for work close to the eye. The members should be small, and good examples ought to be studied. We must again repeat our request that competitors should not send more than *one* sheet. Many of the designs are shown on three or more sheets of paper, which entails increased labour in sorting and packing.

THE PROSPECTS AND POSITION OF THE ARCHITECTURAL PROFESSION.*

By John McLachlan.

THE position and prospects of the architectural profession are of much interest to all of us. Whatever is derogatory to the dignity and honourableness of our calling, whatever in the conduct of any of our own members, or of others, tends to lower us in the eyes of the public, whatever obstacles stand in our way to professional improvement and advancement—all such considerations, hostile to our calling, will be naturally deplored; and, on the other hand, whatever tends to raise the status of architects, to elevate their position in society, to improve their opportunities of professional training, to encourage a cordial sympathy and fellow-feeling among the members—I say, whatever tends in the direction of these objects will naturally excite your appproval. A general observation may be made which will find nobody bold enough to controvert. Within the last half century—in fact, within a much shorter period, an enormous stride has been taken both by our own and other countries in all that relates to art. Artistic ideas prevail now in regions where they were never dreamed of before. Furniture, dress, hangings, wall-papers, crockery, and a thousand other departments are regulated now by the same canons of taste which guide art in the longer acknowledged fields of architecture, painting, and sculpture. If we look around us for a moment, evidences of this truth crowd upon us. In the matter of furniture, for example, a glance at the windows of some of our best furniture dealers, or a visit to some recently-furnished houses, indicate to us the greatest diversity of design in all articles of furniture—the healthy spirit of competition and emulation among the manufacturers, and the sound principles of design which, as a rule, guide them in their work. There is not now the depressing uniformity of design which pervaded the furniture of fifty years ago, nor the pernicious attempts of falsehood, which consisted in making wood look like marble or stone. How often do we come across in the houses of 50 or 100 years ago, mantelpieces of mahogany, with pillars either Doric or Corinthian, fluted and carved with all the details of the Greek or Roman originals, including dentils, blocks, and egg and dart ornaments, or sofas and sideboards, with elaborate, heavy, useless scrolls and details, copied—and not well copied either—from the marble work of the Temple of Lysicrates or the Tower of the Winds. Contrast with such work, with all its pretentiousness and painful attempt to appear what it is not, and the utter poverty of design displayed—and be it remembered that this kind of stuff was all that could be got 50 years ago, there was nothing else to be had—I say, contrast this furniture with what we saw at the Paris Exhibition the other year, where, in obedience to the demands of educated taste, India, Japan, and all the realms wherein good and tasteful stuffs are produced, were called into play in the service of upholstery and house decoration; or indeed, contrast the furniture of our grandfathers with what we see in our best shop-windows now—and we have much reason to be thankful for the past and hopeful for the future. I venture to think that we find in furniture and house decoration a great advance. Simplicity of design, no desire shown to make wood appear any other material, no huge scrolls and other decoration where they are not needed, but the sound principles of construction which apply to wood carefully attended to, parts kept all in due harmony, a directness of purpose visible in making the article of furniture, whatever it may be, clearly and cleverly serve the object of its existence; and when ornament is applied, it is applied with reticence and good taste. The attention bestowed by architects on the whole subject of internal decoration has been so great of recent years that a fear has been expressed in high quarters, and from many sides, that if things proceed as they are doing, the architect will shortly merge in the house decorator, that in the devotion of his energies to designing sideboards, dadoes, dresses, carpets, and "cosy-corners," he will lose altogether the will and the power to design and carry into execution the larger, more masculine, and more important subjects which come within his professional scope. Aqueducts, bridges, sea-ports, terraces, gardens, fortresses, and viaducts, on the Continent, are still within the architect's realm, but it is without doubt that they are so in this country. Without entering into the subject, which is a very important one, and one well worthy of prolonged consideration, of the transference of various kinds of work from architects to the comparatively youthful profession of civil engineer, the point on which I wish to press at present is the vast attention now bestowed on the tasteful decoration of buildings internally, on such matters as the colour and material with which the walls are to be covered, the patterns of paper, the carpeting, and so on. There is a recognition of the canons of taste displayed by even the most careless of housekeepers on such subjects, which is greatly encouraging to those who have a love for art. Glass-staining is a subject which naturally claims our attention in this connection. It is a subject of great congratulation, I think, that good stained-glass is confined not to our churches and public buildings as heretofore, but has found its way into our private houses. In Edinburgh and other portions of Scotland, one is certain to find in the hall and staircase of our good houses, well-designed and executed stained-glass, giving an air of refinement and art which nothing else can give. A window is more potent as an artistic medium than any dead surface can possibly be. Obtuse people may ignore the beauty of a wall-paper, or the lines of a fresco, simply because there is no compulsion to look at them, but no person, even the most unnoticing, can fail to take cognisance of the stained-glass window of a hall or staircase. The very use of one's eyes is dependent upon the rays which come through the glass, every article or object looked upon is tinged with the colour of the medium—and perforce the attention of the most phlegmatic is called to the window. It is of vast importance, therefore a matter of great congratulation, that this important feature of a house is becoming more and more artistically treated. The universal arrangement for a hall or stair-window of 20 years ago, of a diaper-pattern of ground sheet in the middle, with ruby border 4in. broad, with a Vitruvian scroll picked in the red, and with never-failing blue pateras at the corners, is rapidly dying a natural death. Such an arrangement is confined as a rule now to the semi-detached villas of speculative builders, whose object in building houses is not to produce anything beautiful to look upon, but simply, like the scissors-seller in the "Vicar of Wakefield," to produce an article that will sell. I do not say that the orthodox arrangement above described—with its red periphery—is an ugly one. It very often is not ugly; but the objectionable thing is, that it was a universal arrangement, indicating an utter deadness and torpor in the treatment of this important feature. Let us rejoice that the torpor has passed away, and that in the active application of well-designed stained glass we are seeing the indication of more artistic times. In the recently-revived Queen Anne architecture stained glass and coloured glass of various kinds plays a very important part for the upper portions of windows, above the broad transom of wood or stone which is a common feature of the architecture. It is not the least likely that the Queen Anne style will take much root here. It is essentially a style suitable for brick, while our building material all over Scotland is stone—good freestone. The difference of material must and ought to exercise a vast influence on the designer. The lines and proportions suitable for the use of small rectangular blocks of brick are totally out of keeping with the more colossal proportions which are becoming with huge blocks of stone or marble. The style of design which is right and suitable and beautiful in the one case is totally out of keeping in the other. While this is so,—I am quite satisfied that this exceedingly quaint style of building, with its thick astragals, lead lights, and beautiful small and well-proportioned mouldings will never come so far north to any appreciable extent,—I think it a subject well worthy of attention whether we might not, in imitation of its love for stained glass introduce into our windows, both of living-rooms and bed-rooms, a great deal more variety and glory than we usually think of. In an architect's practice, here and now, after he fills a window of a dining-room or bed-room with the best British plate, one-quarter inch thick, or 21oz. sheet, he thinks his duty is completed there. Now I think we might very well and profitably bestow a little more time and consideration than this summary procedure indicates upon our windows. Where light to the rooms is not of supreme importance, as, for instance, in a villa with no immediately contiguous dwelling, it might very well be considered whether a little stained glass in the upper sashes or borders might not be advisable. The feature is a very pretty one, and I see no reason why Queen Anne should have a monopoly of a feature which may be made to apply to all architecture. The improvements in all departments of industry where knowledge of the beautiful can be shown is undeniable. The source to which we more directly trace this great advance is naturally our schools of art. Our carvers in wood and stone, our engravers, our modellers, our designers for furniture, crockery, and ironwork, have all had their hands and eyes trained under able teachers, and with the best models of antiquity before them. Such schools are not confined to Edinburgh and Glasgow, but are to be found in all the important towns of Scotland. Their influence within the last 25 years has been enormous. All those of us who have undergone the training of such schools, can testify to the influence exercised by them on individual character. Brought in contact with the best work of past times, and under the tuition of able, energetic masters, whose hearts are in their work, if there is any latent art-talent within us, any burning love for things beautiful, it is sure to take fire under such circumstances. It is a subject of congratulation that, in addition to the numerous schools and lectureships of art throughout the country, we are now to have a chair of art in our Edinburgh University, the funds for which are insured by the provisions of Sir John Watson Gordon's will. This chair will, without doubt, give great impetus to all artistic subjects among us. It is not to be anticipated that immediate effects will appear. Rome was not built in a day, but the leavening influence of a professorship of art in an intellectual centre like that of Edinburgh will soon render itself felt. This is our first professorship of art in Scotland, and it is to be hoped that the influence on a hard-headed, close-fisted, metaphysical, matter-of-fact people will be encouraging. We labour at great disadvantage in Scotland in all matters of art as compared with such favoured countries as Italy, where the very air is laden with artistic ideas; where the common, blue-bloused workman will criticise you a work of Michael Angelo or Titian in no ignorant babble, but in good set terms. Or I might take an example from the cognate field of music, from an incident which happened under my own eyes in Florence. An audience composed of plain people, the burghers or shopkeepers of the city, at an operatic performance united in condemning a prima donna's bad note, and would in no wise permit her to proceed till after three attempts she accomplished the faulty note to their satisfaction. Such an incident is impossible in Scotland; we have no such artistic training here. The day is just dawning upon us. In Italy the people have been under training in such matters for centuries. Art runs in their blood. The great men of their country, of whom even the common people are proud, are not so much their kings, their warriors, and their statesmen, but their architects, sculptors, and painters, their Tintorettos, Veroneses, Michael Angelos, Palladios. What a contrast this is to our Scotland. In a bleak, unfertile, rocky country our ancestors had enough to do to wrest a living from the sterile rocks. No time was theirs for the amenities of life, for those arts which render life worth living for, the painting, the sculpture, and the architecture. A better day is drawing upon us, the country is becoming, by the sturdy energy of her sons, more and more wealthy. The cultured leisured class are increasing in number, and the arts of peace are flourishing. It is of the utmost importance that as we proceed in our race of artistic life, our taste should be wisely guided, that true canons of art should regulate us both in designing and criticising. It is from this point of view that the appointment of a profesorship is of national importance. The prelections of the class-room will influence the whole people, stirring up thought, discussion, and controversy. Our national love for combat and metaphysics will find ample play in rival theories of art-opposing styles of architecture—different canons of taste—but contest indicates life, and as these subjects of art are discussed among us with more and more vigour and knowledge, the more does the subject itself become part of the life and soul of the people. Having said so much on several incidents and features which seem to be entirely favourable to our profession, which appear to tend to consolidate our honourable position in society, and which tend to the enlarging and extending of our professional knowledge, it may not be out of place to take note of things which lower us in the eyes of the world, some characteristics of modern architects which do not raise them in the eyes of men. It is not wise to be too self-complaisant, to be perpetually singing pæans of self-gratulation over our progress. It is well to look in the mirror occasionally to see where stains and soiling are, so that a cleansing remedy may be applied to remove defects where they are found to exist. Among the subjects affecting our profession which are perpetually cropping up in law courts or elsewhere, is that of commission. I do not mean, of course, the legitimate fee of 5 per cent., which is nothing more than fair remuneration for the arduous and responsible work of the architect. The commission which appears in so many lawsuits as being paid to architects is the surreptitious, underhand, disgraceful bribe applied by manufacturers, patentees, and other proprietors of building appliances to have their goods introduced into buildings. There can be but one opinion among honest members of our profession about this species of commission, and I think it is not unbecoming an association like this to set its face against such practices, which assuredly tend to disgrace our calling. The leaven of this corruption works in divers ways, and I think it is well that every upright practitioner should lend a helping hand to its exposure. One test is sufficient to blow all the plausible theories advanced for accepting commission such as I speak of into the clouds. If the architect will in plain words inform his employer that on the £100 roof which he has just designed he has pocketed £25 of commission irrespective of his fee, then, but not till then, I shall believe that the architect is acting as an honest man. There are, however, other and grosser forms in which commission is sometimes taken, or in which I have heard it was taken, which only require to be mentioned to receive the hearty condemnation of such an association as ours. I have heard that some men calling themselves architects have in taking estimates so manipulated the offers of the tradesmen as to secure the work for creatures of their own; have so arranged the figures of the offers by opening them beforehand and adjusting them with contractors on whom they wished to confer the work, that large slices of emolument should be hidden in the estimates, ultimately to pass into the pocket of the architect. Such a form of wickedness—for it can be called nothing else—is little liable to become common unless among men who are bent on being rogues. It is conscious of its blackness and so keeps out of sight. Let us, then, visit with righteous indignation, wherever we find them, such mean and dastardly attempts to lower an honourable calling. As long as we accept and act upon the sound and healthy principle that the architect should in connection with his work receive *no remuneration whatever* except what he receives directly and immediately from his employer, there is no danger of our profession falling into disrepute. Let us act as upright men receiving no back-hand gifts or commissions or douceurs or bribes, and visit with exposure and contempt all attempts to the contrary mode of dealing, and I venture to think that in course of time we shall take a higher and more honourble position in society. An aspect of this commission question presents itself which is of vital consequence to the outside public who employ architects. These members of our profession who live by their legitimate fees may often be twitted with the largeness of our recognised fee of 5 per cent., and be told that many practitioners work for less. I have no desire to lay down a hard and fast line on this point, and say that in some instances—such as in the case of large plain buildings, stores, or warehouses, where there are hundreds of pillars of the same dimensions, windows all the same and so on—I say in such a case our fee may with fairness be modified very much. There is no possibility of laying down a hard and fast line of remuneration. Each case must be decided upon its own merits, and with a fair spirit on both sides,—there is no danger of any serious collision between client and architect. But speaking generally, I am satisfied I am expressing the feelings of all architects who have been in business for any length of time that the ordinary recognised fee is as fair and moderate remuneration as could be stated. A less fee will not remunerate any professional man adequately, if he discharges his duty faithfully and energetically to his client. And it is here that this question of commission works mischief. Some architects offer their services for 3, 2, even 1 per cent. I have heard of some cases where architects offered even to work for nothing. I would warn all clients to look with much suspicion on such offers, because it is scarcely possible that the architect can be acting in good faith. He finds his fee inadequate, and inevitably betakes himself to devious ways of commissions and bribes from contractors to eke out his living. This is so palpable that it is astonishing the outside public who employ architects do not see it. But it is within my own knowledge that there are men belonging to our profession who habitually undertake work for a nominal fee to the client, but who make that same client pay the amount of three or four fees by manipulating the items in the schedules with the contractors in such a way as no client can detect. The thing is scandalous and disgraceful, and we cannot do better towards our profession than by denouncing such courses of procedure, and, in our own practice, preserving clean hands. Depend upon it, honest, upright dealing will, in course of time, receive its due reward.

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* Presidential Address, delivered at the meeting of the Edinburgh Architectural Association on the 17th inst.

The President concluded his address by a reference to the meeting to be held in May next, in London, under the auspices of the R. I. B. A., and expressed a hope that good to the profession might result therefrom, especially in connection with the matter of competitions.

THE LAW AS AFFECTING QUANTITY-SURVEYORS.

At the meeting of the Institution of Surveyors on Monday evening, Mr. F. Turner, barrister, read a paper upon this subject. The author defined a quantity-surveyor as one employed to ascertain, by the oversight of another's project for buildings, or other constructive works, the quantities of material, and of certain kinds of labour, required for their accomplishment. As a distinct and independent vocation, said Mr. Turner, the profession is so nearly of yesterday, that a much-respected member of the Institution of Surveyors is often described as "the Father of Quantity-Surveying." And yet he has a kinship, if he cannot trace lineal descent, from the "men of skill and cunnynge," who, according to a Statute of the First Edward, were busiest when "castelles and other buyldynges" were doomed to destruction. The modern quantity-surveyor is, however, chiefly wanted when a man who desires to build a house sits down to count the cost whether he will be able to finish. The endless and ever-increasing details of extensive building operations have made such preliminary calculation a work of immense labour, which the architect is generally unwilling—which many builders are but indifferently qualified—to undertake. To fill the gap, the quantity-surveyor came into separate existence, by a process of natural selection, in the course of which the architect or surveyor who had the best head for figures developed, by survival of the fittest, into the quantity-surveyor pure and simple. This separation, though now sufficiently pronounced, was gradually and almost imperceptibly accomplished. The builder originally estimated quantities for given works in a rough-and-ready way, by memory and the rule of thumb, with results neither more nor less satisfactory than generally attend that process, until, in course of time, the quantity-surveyor had vindicated his *raison d'être*. Having done so, what are his obligations, responsibilities, and remedies? To whom does he owe the one, and from whom must he, under given conditions, seek the other? His obligations may be briefly summed up. He must have a competent degree of knowledge, which he must exercise with reasonable care and skill. This requirement of "competent knowledge and skill" has all the merits and all the demerits of general rules. It is so true that no one can dispute it, and so vague that no one can determine whether a particular case comes within it. In other words, it is a question of fact for the jury, to be decided on a consideration of the nature of the work, the circumstances of the case, the experience of the surveyor, and the representations he may have made as to his own qualifications. He is not bound to reach the very highest standard of professional excellence, but he is bound to possess a reasonable amount of natural capacity, and to have cultivated his powers with reasonable diligence. The obligation as to care and skill in the performance of a particular work must be stated in very similar terms. It is, of course, open to any quantity-surveyor to warrant his quantities, vouching their absolute accuracy, and undertaking to make good the loss which any inaccuracy may occasion to builder or building-owner. But, in practice, such warranting is very rare, and it is doubtful whether it is ever advisable. In every set of plans and specifications there will be many items which different persons will differently construe, and as to which the quantity-surveyor must exercise a certain amount of discretion. He must not be a mere measuring and calculating machine. He is bound to take out his quantities "with brains";—to bring his knowledge of architectural detail, and of the properties of different materials, to bear upon the work in hand. Even in carefully-prepared plans and specifications, there will be occasional ambiguities and inaccuracies, for which the quantity-surveyor must make allowance on one side or the other. And when he has done his best and his utmost, there will remain the inevitable residuum of mortal frailty, which will crop out somewhere and somehow, when the work in hand necessitates hundreds or thousands of minute calculations. *Humanum est errare;* but the point at which the error ceases to be venial, and becomes evidence of lack of reasonable care and skill, is, like lack of reasonable competence, a question of fact for the jury. Precise definition is the more impossible, because, while competence may be with each individual something like a fixed quantity, the measure of care and skill may be affected by many circumstances. The materials provided for the quantity-surveyor may consist of plans hastily drawn, or more hastily adopted from other buildings in which they have already done duty; they may have been finished without proper care, or perhaps not finished at all; some portions of them may involve structural differences of which no sufficient account has been taken; the specification may be loosely and inadequately worded, and the time between the first instructions and the day on which the bills of quantities are to be ready for the builders may be entirely insufficient. When work is performed under such conditions, the quantities should form part of the contract, as then the building owner will not have to pay for what he does not get, nor will the builder have to supply anything for which he is not paid. It may be said that such a course tends to make the quantity-surveyor careless, and consequently to injure the profession by lowering its standard of excellence. This may be so when the materials and time are both sufficient. But the quantities will be stipulated as a part of the contract by every surveyor who would make himself safe, for when a building fails to fulfil expectations, he who has hurried on or scamped his part is precisely the man who is most likely to find fault with the consequences of his own mistakes, and attribute them to the quantity-surveyor's negligence. In addition to these three qualities, of reasonable competence, care, and skill, the quantity-surveyor, like all other persons in confidential capacities, is bound to the strictest good faith and the highest honour. Mr. Eve spoke in that room in April last of charges for lithography, multiplying the real cost manyfold; of quantities "loaded" with a fancy price for abortive plans; of "the privilege of tendering," purchased by adding a percentage to the contract, which builder or building-owner must pay. Any such deflection from the straight line of duty is forbidden, alike by the law of the land and by the higher laws of morality. It cannot be too clearly understood that decision after decision has firmly established the doctrine that all profit, secretly made by a confidential agent, belongs to the principal, even when he has suffered no actual damage from its improper receipt, while, if damage does result from any such bargaining, neither judge nor jury, when dealing out penalties, will weigh in golden scales the sum payable by the agent who has thus betrayed his trust.

(*To be continued.*)

BOOKS RECEIVED.

Mediæval Trade-Cards (London: Marlborough and Co.) are patterns of a series of superior trade-cards, almanacs, &c. There is nothing particularly Mediæval about them, but they are generally of decent design—principally foliage or conventionalised—and very well executed; quite superior to the usual run of such things a dozen years back, and better than a good deal turned out now.——*Domestic Plumbing and Water Service*, by William White, F.S.A., F.R.I.B.A. (London: Lockwood and Co.) is a readable, useful treatise. It seems principally written to recommend the sanitary appliances manufactured by a Midland firm, in which Mr. White has, as he says, an obvious interest, but that interest is not unduly obtruded; the author's conclusions are, we think, sensible and fair, and we are glad to see a leading architect like Mr. White moving in a matter to which many among us have heretofore given by far too little attention.——The *Elements of Mechanism*, by T. M. Goodeve, M.A. (London: Longmans and Co.) is a new edition, rewritten and enlarged, of a standard text-book of its subject.——*London Smoke and Fog*, by Frederick Edwards, jun. (London: Longmans, Green, and Co.), is an interesting additional chapter to the author's well-known book on the Ventilation of Dwelling Houses. We are not inclined to agree with Mr. Edwards in some of his strictures on open fireplaces; but he is fully entitled to be heard on the subject, because he writes well, and is practically acquainted with his subject.——*Stationary Engine Driving*, by Michael Reynolds (London: Lockwood and Co.), is a practical, well-written, and well-illustrated manual, which should be placed in the hands of everybody in charge of an engine. There are nowadays so many places where engines are at work and where an engineer, properly so called, is never seen, that the book ought to have a large additional circulation outside the circle to which the author more especially appeals.

SCHOOLS OF ART.

Dudley.—On Saturday, Mr. G. W. Hastings, M.P., distributed the prizes to the successful students of the above school. The annual report showed that 145 students had attended the art and 18 the science classes during the year. This was an increase, and the fees had amounted to £171 18s. The Government grant had been £91 7s., and the subscriptions £51 5s. The lack of subscriptions showed a want of interest in the objects for which the schools were founded. It was stated that out of 50,000 inhabitants only twenty-five subscribed to the funds of the school, and that only two members of the Corporation gave anything.

Perth.—The prizes and certificates gained by successful students in the Perth school of art were distributed on Monday night by Mr. C. S. Parker, M.P., who gave an address, in which he dwelt upon the advanced place amongst the men of science and inventors taken by Scotchmen, and expressed the hope that something more would be done in a national way for the development of art in Scotland. The annual report showed that 206 students attended the art classes last session, being an increase of 38 over the number of the previous year. Of these, 62 sat at the local examinations, with the result that 10 prizes and 42 certificates were gained. Besides this, one advanced certificate was gained in solid construction, 7 passed in machine construction, and 8 in building construction. In the science classes proper, 1 prize and 7 certificates were taken, in mathematics 1 prize, and 7 certificates in chemistry.

ARCHITECTURAL & ACHÆOLOGICAL. SOCIETIES.

British Archæological Association.—The opening meeting of the new session was held on Wednesday last, the Rev. S. M. Mayhew in the chair. The Rev. Prebendary Scarth described an early font, apparently Saxon, in Stanton Church, Gloucester. The Rev. J. A. Lloyd reported the discovery of Saxon carved work during the recent restoration of his church at Broad Hinton, Wilts, and exhibited a full-sized drawing. Mr. Loftus Brock, F.S.A., reported the discovery of a Roman pavement of beautiful design in the Close, Winchester, of which the Rev. C. Collier sent a drawing. Mr. Walker produced and described the matrix of the old Chapter Seal of the Church of St. Peter, Wolverhampton, which has replaced an earlier one of silver now lost. Mr. Lewis described a kitchen-midden at the Roman Castle of Pevensey, and exhibited several fragments of very early pottery. He exhibited a rubbing of a Saxon coffin-lid, found at Bexhill church, where much Saxon walling has been found above the Norman arches during recent repairs. Mr. W. Myers, F.S.A., produced a vast number of flint implements from Cissbury Camp, and described the circumstances of their discovery upon the surface of the ground where large quantities may be found. Mr. C. Brent, F.S.A., exhibited a Hebrew phylactery, and a remarkable Etruscan puzzle case without any aperture. The chairman produced several beautiful specimens of early pottery found in London, including a 13th-century green ware jug of large size. Also an early Chinese carving in jasper, found in excavations at Bishopsgate. Mr. Thos. Morgan, F.S.A., read a paper on the results of the recent congress at Devizes, and reviewed the principal objects inspected, alluding especially to the discussion at the meeting at Stonehenge. The second paper was by Mr. C. H. Compton, on the Castle Tower in the Tower of London, which has recently been opened out and freed from the modern buildings that surrounded it. The roof is beautifully groined, and, as the reader observed, the Tower afforded access from the moat to the Queen's apartments. The whole has been thoroughly repaired under the direction of Mr. Taylor, of H.M. Office of Works. A large Roman brick, from the recently-discovered wall, was exhibited and described. A paper by Mr. Loftus Brock, on the Roman Wall, was postponed on account of the lateness of the hour when the proceedings terminated.

Cambridge Antiquarian Society.—At the last meeting of this society, held on the 15th inst., Professor Hughes exhibited some Roman objects found under a stone in Cwmllech, near Blaencwmpennantmoelangell, in Denbighshire; they consisted of an intaglio in sardonyx, with the device of a lion *passant*, set in an ornamental gold ring, with a torque cable border. With them were found two Roman brass coins of the Emperors Caius Victorinus and Gallienus (260-8 A.D.) The exhibitor showed that there was abundant evidence that the Romans advanced far into the eastern valleys of the Berwyns. He also showed a small token, found in excavating for foundations at Trinity Hall, Cambridge, having on the obverse a stag *passant* and the name "William Li(m)ber," and on the reverse, "Lover W.D." and the legend "In Chesterton." A paper was read by Mr. W. K. Foster on his recent excavations at the Anglo-Saxon Cemetery at Barrington, Cambs. During May and June last he opened 114 graves, which yielded a harvest of Anglo-Saxon relics, including fibulæ, beads, clasps, spears, and swords. On the same site was a fosse, and within its area a number of pits, all filled with a dark greasy earth, interspersed with fragments of rough pottery, bones, and teeth of animals. The fosse and pits he regarded as earlier than the Anglo-Saxon cemetery. Among the objects exhibited were four pairs of bronze-gilt fibulæ, saucer-shaped, and having detached rings; two pairs of bronze-gilt clasps, said to be unique; and two ale-vats of wood, one with bronze rings, the other hooped with iron. The Vicar of Barrington showed other objects recovered from the same spot, and regarded the earlier fosse and ditch to have been the site of an Anglo-Romano dwelling-place. Mr. Redfarn showed an English terra-cotta lamp, and Mediæval pottery, found at the back of a house in Petty Cury, Cambridge.

Edinburgh Architectural Association.—The first meeting of the 23rd session of the above Association was held last week, when the inaugural address was delivered by the President, Mr. John M'Lachlan, which we give in another form elsewhere.

The Liverpool Architectural Society.—The second ordinary meeting of the thirty-third session was held at the Royal Institution, Colquitt-street, on the evening of Nov. 3rd, the President, Mr. C. Aldridge, F.R.I.B.A., being in the chair. There was a good attendance, and the paper of the evening, entitled, "Two Faces under a Hood; or, Hypocriticism in Art," was read by Mr. Joseph Boult. A discussion ensued upon the merits and demerits of the Queen Anne style of architecture, in which Messrs. J. F. Doyle, Wm. Parslow, F.R.I.B.A., Joseph Boult, and the President took part. Previous to the ordinary meeting a meeting of the class of design and construction was held in the small library, under the guidance of Mr. C. E. Deacon and Mr. J. F. Doyle, when 13 sets of designs for a "sideboard" were handed in. The second meeting of this class was held Nov. 17th, when Mr. Aldridge delivered the first of a series of lectures on construction, the subjects for the first being:—The Local Building Acts; choice of site; soil, aspect, and levels; excavations, and concrete.

COMPETITIONS.

Pontefract.—The Corporation of Pontefract, in answer to advertisement, have received no less than 59 sets (averaging from 5 to 9 sheets in a set) of plans, under various mottoes, for an addition to the very old Town Hall. They have been forwarded from all parts of the country, and the cost and trouble some of the designs have taken in execution is extraordinary when we consider that the first prize is only £50, and the second £25, and tends strongly to show the present stagnation of trade. The vote in council restricts the sum to £7,000 as the cost of the new building, but some of the perspectives will take that amount to complete the main front, and probably bring up a total of £20,000, and we are assured by a correspondent it would be a difficult matter to get a respectable builder to undertake the work of building half a dozen sets out of the whole lot for the amount specified. The Corporation will do well to call in the aid of a professional arbitrator before giving their final decision.

The North British Railway propose to construct a new tidal basin at Silloth. It will be six acres in extent, being one-half larger than the old dock at that port, and will have an entrance from the south end of the old dock 60ft. in width, with one pair of gates. Messrs. Meek and Son, civil engineers, of Edinburgh, have been requested to publish a report on the proposal, and they visited Silloth last week, accompanied by Mr. C. Boyd, the railway company's resident engineer.

The memorial-stone of new Sunday-school buildings, about to be added to Conduit-street chapel, Plumstead, was laid on Tuesday week. The buildings will accommodate 500 children, and include a lecture-hall, seated for 200 adults, infants' room, and class-rooms. Mr. Johuson, of Powis-street, Woolwich, is the contractor.

A new mission church was opened in Berridge-road, Gipsy-hill, by the Bishop of Rochester, on Wednesday week. It is built of red bricks, and consists of nave, transepts, chancel, organ-chamber, and vestry, and is seated for 280 persons. The organ is being built by Messrs. Walker, of London.

A new Baptist chapel was opened at Shoreham on Wednesday week. It is Italian in style, and was erected from the designs, and under the superintendence of, Mr. Arthur Loader, of Brighton. Mr. Bruton was the contractor, and the cost was about £1,300.

The historical painter, Léon Cogniet, died in Paris, on Sunday, at the age of 87. He was a pupil of Guerin, and took the Prix de Rome in 1817. The picture that established his fame was "Tintoretto Painting the Dead Body of his Daughter," which was exhibited in 1845, and purchased by the Bordeaux Museum.

The Wesleyan chapel at Faversham, Kent, was reopened on Monday week, after renovation, internal decoration in colour, and improvement, effected at a cost of £600. Mr. E. Hoole, of London, was the architect, Mr. Fuller, of Faversham, the builder and Mr. F. Baker executed the decorations.

Building Intelligence.

Bermondsey.—The foundation-stone of a new Town-hall for Bermondsey was laid on Tuesday, on a site at the corner of Spa-road and Neckinger-road, Bermondsey, in the presence of a large gathering. The site contains upwards of 49,000ft. superficial, which has been purchased at a cost of £12,000. The public hall, estimated to hold 1,200, will be 80ft. by 52ft. 9in. in the clear, and 37ft. 9in. in height, with galleries on each side, and an additional gallery at the south end. The ground-floor, according to the plan, contains accommodation for the several officers of the vestry, and of the boards of governors and directors, together with a board room, 46ft. 9in. by 29ft. 6in. in the clear, and 20ft. in height. The public hall, which has been designed on the model of Shoreditch Town-hall, may be used without at all interfering with the business of the parish. The cost of the building is £21,200, and the contractors are Messrs. Perry and Co., of Bow. The architects are Messrs. G. Elkington and Son, 95, Cannon-street.

Cockermouth.—On Thursday week, a new Sunday-school, erected in connection with Christ Church, Cockermouth, was opened. The school is built in the Early Geometrical style, from designs by Mr. W. C. Jennings, architect, Cockermouth, under whose superintendence the work has been carried out. The walls are constructed of Tallentire stone, in course-snecked rubble, with skew chiselled dressings. The building is roofed with green slates from Buttermere Quarries, surmounted with a red tile cresting. Besides the main schoolroom there are two class-rooms, one on either side of the vestibule, each measuring 13ft. by 9ft. 6in. Over the vestibule and class-rooms is a school for infants, 20ft. by 13ft. The ceiling has been decorated by Mr. John Boyd, of Cockermouth, from designs by the architect.

Dover.—The memorial-hall and Dover Tabernacle was opened on the 16th inst. The building consists of a hall capable of accommodating 500 persons (exclusive of galleries for which provision has been made); schoolrooms for 300 children; double vestries and offices. The nature of the site—a narrow frontage, widening out behind—necessitated special planning. The hall being almost entirely surrounded by adjoining buildings, light is chiefly obtained from a large lantern in the roof. The schools are placed in front on the 1st and 2nd floors, the ground-floor being occupied by the entrance corridor to hall, staircase, and kitchen. The whole buildings are Early English in character. The front is built of red brick with Bath stone-dressings, and the roofs are covered with Bangor slates. The contract was undertaken for about £1,860, and carried out by Mr. Bromley, of Dover, from the drawings and under the superintendence of Mr. Andrew T. Taylor, A.R.I.B.A., of Moorgate-chambers, 72, Finsbury-pavement, E.C. A pen-and-ink drawing of it was exhibited in the last Royal Academy Exhibition, and was reproduced by us in the Building News of Oct. 8.

Dunstable.—A new town-hall was opened at Dunstable on Wednesday week. It has been erected on the site of the former one, destroyed by fire in December last, and is a much more commodious structure. The ornamental street façade remained uninjured, and has been repaired and retained, and a new clock-tower built over the central entrance. This leads to a rectangular hall, seating 300 persons, on the ground-floor, and nearly 200 more in galleries. It is lighted by a glazed roof carried on girders, and also by windows on one side, and has a permanent platform. At the rear are a dining-room and a committee-room; and on the upper floor, over the kitchen department, is the magistrates' room, which is lofty and well lighted, and seats 200 persons. Mr. Henry Elliott, of the Strand, London, was the architect; and Mr. F. F. White, of Dunstable, the builder. The cost of reconstruction has been £1,690.

Honiton.—The chancel of the parish-church of St. Michael, Honiton, is being restored, and the work is to be completed by the 31st December. Mr: Edward Ashworth, of Exeter, long since prepared the plans, and under his immediate supervision the restoration has gone on for the last eight or nine months. There will be new carved oak stalls in place of deal green-baized pews; encaustic tiles will be laid in the avenues; a three-light east window will take the place of the former one of questionable taste; and the old rood-screen, some 50ft. long, and gracefully groined on each side, and the two fine old parclose screens, which run at right angles from it, have been carefully restored. The works are being carried out by Mr. Harry Hems, of Exeter.

Kensal New Town.—A new church is about to be erected at Kensal New Town for the congregation of Our Lady of the Holy Souls. The architect is Mr. J. F. Bentley, of John-street, Adelphi. The plan will consist of a continuous nave and chancel, 30ft. wide and about 130ft. long, and narrow aisles 6ft. wide. The church will be entered by a porch in Edenham-street, divided by a glazed wooden screen from the nave. The high altar will be backed by an arcading sufficiently in advance of the east end to form a passage-way between the two walls. In a space divided from the chancel by a pierced stone screen will be the recess for the organ. At the east end of the north angle will be a chapel, and at the west a baptistery, and laterally there will be recesses for a Calvary and confessionals. The features of the church will be the broad spacious nave and chancel, with low arches and tall clerestory windows, from which the entire building will be lighted, the plain unbroken barrel-vault extending the entire length of the building. Attached to the church will be sacristies and a new infant-school added to the adjoing schools. The estimated cost will be about £4,500, and the works will be begun early in the new year.

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CHIPS.

Dr. W. Collingridge, Medical Officer of Health to the Port of London, is delivering a course of practical lectures in connection with the St. John's Ambulance Association to the employés of Messrs. Cassell, Petter, Galpin, and Co., at the Memorial Hall, Farringdon-street.

Shrewsbury Town Hall, commenced in 1834 and finished in 1837, was destroyed by fire last week. The building was erected from Sir R. Smirke's design, and was of no particular architectural merit, but a number of valuable pictures have been lost.

The foundation stone of new premises at Huddersfield, for the Huddersfield Banking Co., was laid last week. The contracts entered into up to the present time amount to about £17,000. The fire-proofing will be done by Messrs. Dennett and Co., of Nottingham and London; and the carving by Mr. Harry Hems, of Exeter. The building is being erected from the designs and under the superintendence of Mr. Edward Hughes, F.R.I.B.A., of Lord-street, Huddersfield.

At Sheffield on Saturday, John Johnson, joiner and builder, Wincobank, filed a petition for liquidation, with liabilities amounting to £18,500. The principal portion of the liabilities are debts owing upon mortgages of properties belonging to the debtor.

On Saturday Mr. Mackie, the Member for Wakefield, laid the foundation or corner stones of an enlarged Primitive Methodist chapel at Wakefield. The premises are now in course of enlargement and reconstruction, in accordance with plans prepared by Messrs. John Kirk and Sons, of Huddersfield and Dewsbury. The alterations will involve an expenditure of about £1,000. Messrs. King and Dunning are the contractors for the bricklayers' work, and Mr. John Baker is executing the joiners' work.

The freehold house, No. 49, Long-lane, Smithfield, adjoining the "Barley Mow Tavern," one of the oldest houses in the City of London, having a ground-floor area of only 190ft., was sold last week by Mr. Robins (of 5, Waterloo-place, Pall Mall) for the sum of £860.

A memorial stained-glass window, executed by Mr. Ion Pace, of the Adelphi and Battersea, has been executed in Hare-court Chapel, Canonbury, as a memorial of the late Dr. Raleigh.

The death is announced, at the age of 68, of Mr. George Wagstaff Yapp, latterly of Wandsworth, but for many years a contributor usually from France to the Building News, of articles on applied art and kindred topics.

The Archdeacon of Ely, Dr. Emery, in his visitation charge last week, referred to the general and marked improvement throughout the archdeaconry of the material fabrics of the churches. There was not one church in Cambridge, for example, on which there had not been, during the 17 years he had held office, a large expenditure for renovation, both without and within.

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Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Received.—B. and Co.—G. W. R. and Co.—G. E M.—W. T. C.—C. P.—S. W.—V. S. Co.—H. B.—E. S. H.—C. Bros. and Co.—M. and L.—L. B. Co.—R. H. and Co.

J. S. (Try at Batsford's, 52, High Holborn.)—B. S. (Your statements are such as can only be inserted with your name and address. If you choose to append these, we will insert your letter.)

"BUILDING NEWS" DESIGNING CLUB.

Edmund (there is no fee required); Sunset (rather late); Black and White, Epérgos, E. Pilling (no vestry is necessary for the chapel); I will either make a Shaft or a Bolt of it, A Bundle of Rue, G. Albert, S. Doughty.

W. in W. (The top of the bookcase might be made available for china.)—Gilbertus. (All drawings are returned after the review has appeared.)

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Correspondence.

TRAPPING AND VENTILATING HOUSE-DRAINS.

To the Editor of the Building News.

Sir,—From the number of letters which have appeared lately in the Building News, I judge that house-drains and their trapping and ventilation now claim more than ordinary attention. May I, therefore, be allowed to point out that what is required to be done is to prevent stagnation of the air in any part of a drain?

A house-drain properly consists of two portions: the one horizontal or nearly so, reaching from the sewer to the back of the house; the other vertical, at the back of the house. These two portions must be continuous and intact. In such a drain there are two currents: one of sewage downwards, and the other of air upwards; and although the liquid sewage will run downwards through a trap, the air will not pass upwards through it; indeed, the trap is placed there for the purpose of preventing the passage of air that way, like a sentinel in a guardhouse. At various points, in the length of the drain, there are branches communicating with the house. It is these branches which require trapping; the main portion of the drain should have no trap at all, except it be found possible to place one close to or very near the sewer, and then a trap may be placed there, provided an opening for the admission of fresh air be made on the house side of the trap, so that fresh air may enter the drain at that point, and continue its course uninterruptedly through both the horizontal and the vertical portions of the drains, and make its exit above the roof of the house. In what I have said I presuppose that the vertical portion of the drain, which is the ventilating pipe, and should be of the same size as the horizontal portion of the drain, is a pipe specially erected for the purpose of a ventilating pipe so as to make the house-drain continuous and perfect; and where such a pipe is provided, the soil-pipe of the water-closets may discharge into a trap, and have an opening at its foot for the admission of fresh air; but where no special vertical ventilating pipe is provided, then the soil-pipe should have no trap at its foot, but should be made continuous with the horizontal portion of the drain. In that case the vertical portion as well as the horizontal portion of the drain will have branches upon it communicating with the house, each of which should be trapped. Every branch, both of the horizontal and vertical portions of the drain, should be as short as possible; but whatever the length of any branch may be, it should have a fall in its whole length somewhat less than its own diameter; otherwise it requires a ventilating pipe for itself.

Now if these principles be attended to there will be no stagnation of air in any part of the drain; but if traps are placed in wrong positions then the air in the drain becomes increasingly foul day by day, because it is stagnant and in contact with sewage, and sooner or later it will probably find its way into the house. I suppose I know all the methods of trapping and ventilation which have been tried, and I judge them all by this one standard—whether they have any tendency to create stagnation of the air in any part of a drain or sewer; and that which is the least objectionable in this respect I consider to be the best in practice. If the air in a drain be allowed to stagnate and become so foul as to be injurious to health, we have no practicable means of remedying the evil. Disinfectants will not do it. How much better, then, to allow the foul air neither time nor place to form in.—I am, &c.,

Charles Slagg.

COMPETITIONS. — LIVERPOOL INSTITUTE AND SCHOOL OF ART.

Sir,—No less than 75 sets of designs (embracing 598 drawings) have been sent in for the above building, the contemplated outlay on which is only £10,000, yielding, therefore, if carried out, a commission to the profession of £500.

May I venture to ask each competitor to assist the investigation of the R.I.B.A. Competitions Committee, by informing me by letter (under his motto if he pleases) the actual out-of-pocket expenses incurred in preparing his design, and also as nearly as he can the amount of time expended on it, by himself or his assistants, and his own assessment of the value of such time.—I am, &c.,

Thomas Porter, Hon. Sec. R.I.B.A. Competitions Committee.

2, Westminster-chambers, Victoria-street,
Nov. 20.

A HINT TO COMMITTEES, LOCAL BOARDS, &c.

Sir,—May I, through your paper, take the liberty of advising all Competition Committees (not omitting the R.I.B.A.) to follow the good example set by the committee for the New School of Art, Liverpool, and publish in the Building News a list of the mottoes of the drawings that have been received?

Usually competitors cannot tell, before the competition has been decided, whether their drawings have been received at all, or whether through delay in transit they may have been received too late, and so disqualified.—I am, &c., D. M.

VENTILATION AND DRAUGHT.

Sir,—In an article entitled "Ventilation and Draught," in the Building News for Nov. 12, it is stated that, for dwelling-houses, there is one objection to walls which are impervious to damp, viz., the condensation of moisture on their inner surface, "but that this might be prevented, to a great extent, by the use of a lining of cork, a method that has been attended with some success in some of our ironclads." In a damp and changeable climate like ours this is a matter of no little importance, and it is a question whether walls built of, or plastered on their inner surface with some impervious material (such as Keene's cement), do not, by attracting the dampness existing in the atmosphere of the rooms and causing it to condense, fulfil a healthful and beneficial purpose. I believe it was Dr. Richardson who remarked that walls of this description are a sure guide to the necessity or otherwise of artificial heat in occupied rooms. The difference of feeling experienced on entering an unwarmed room in cold, wet weather, where the walls are thin, and built of porous bricks, compared with one where the walls are constructed of solid concrete, and impervious to moisture, is something remarkable. I submit, therefore, that a porous wall, even if built hollow, to prevent moisture penetrating from the outside, but which absorbs a certain amount of dampness internally, is inferior in healthfulness to non-porous walls. Bricks that have been in use in walls of stables are quite unfit afterwards for house-building purposes, on account of their having absorbed the impure gases generated in stables; and where the latter have to be converted to other uses, they retain their peculiar odour for years afterwards. For roof-coverings for stores, granaries, farm-buildings, and temporary structures, galvanised corrugated iron would, in many cases, be the most suitable material, were it not for this condensation, which, forming into globules of water, ultimately drops to the floor beneath, or trickles in little streams down the smooth surface of the iron, and thence to the walls. A remedy for this has been asked for in vain in the columns of the Building News; possibly, if a lining of hair-felt, or some good non-conductor, could be fixed to the waved surface of the iron by an adhesive material, it would be a partial remedy. Through-ventilation has been suggested, but is practically of little use; matchboard lining is expensive, and not always practicable, as with curved roofs, for instance. The application of cork as an absorbent lining to the ironclads is, I am told, only a partial success, and requires frequent renewals; moreover, it would appear to be carried on in a very limited way, as no advertisements relative thereto ever appear in the building journals, and, having made inquiries of nearly every cork-merchant in London, no information can be gained as to the practice, or the proprietorship of the patent—if any exists. An inexpensive method of covering the insides of sheet-iron roofs, to prevent condensation, and assist in making them better non-conductors of heat and cold, is much needed, and would undoubtedly lead to that material coming more generally into use for certain purposes.—I am, &c., Thomas Potter.

THE MODERN BARRACK—ITS PLANS AND CONSTRUCTION.

Sir,—May I correct an omission that seems to have occurred in all the published reports of the paper upon this subject, read by Mr. Ingress Bell at the Royal Institute of Architects?

Neither in the *Transactions* of that body, nor in the professional papers, is any allusion made as to the authorship of the numerous designs exhibited at the meeting. Mr. Bell must therefore have failed to make it clear that I was the designer of them all, with the exception of the elevation of the Knightsbridge Barracks.

In these several works I was ably assisted by Mr. J. M. Rogers, A.R.I.B.A., and the other architectural draughtsmen of the Designing Branch, which was under my immediate supervision. I regret that I was unable to be present at the reading of the paper, as I should have been able to have explained some points which, by the reports, appear not to have been clearly understood.—I am, &c.,

H. C. Seddon, Major R.E.
7, Upper Nile Terrace, Rochester, Nov. 22.

Sir,—I see in your last issue that Mr. Ingress Bell says in his lecture at the Royal Institute of British Architects last week, that the best way to warm barracks is by open fire-places, and that the best open fire-place grate is one made and perfected upon suggestions given by Captain Douglas Galton. In this matter, I beg to inform Mr. Ingress Bell that he is quite incorrect, for I never had the least assistance from Captain Douglas Galton, or from anyone, when I brought out the Manchester grate.—I am, &c., E. S. Shorland.

Manchester Grate Works, Manchester,
Nov. 22nd.

Sir,—In reply to a question from Mr. E. C. Robins, Mr. E. Ingress Bell said, "that the stoves of Captain Galton were universally used, and worked well." Mr. Bell here inadvertently fell into an error, as we supply many powerful air or pedestal stoves of a special construction for these buildings, and not unfrequently other stoves; and as contractors to H.M. War Department for both Captain Galton's as well as all other stoves, we should like to correct a small error that may unintentionally mislead.—I am, &c., G. H. Hayward.

Dyers' Hall Wharf, 95, Upper Thames-street,
London, Nov. 24.

Intercommunication.

QUESTIONS.

[6303.]—**Down-Draughts.**—What is the cause of down draughts proceeding from large glass surfaces? How can they be remedied?—S. H.

[6304.]—**Seats in Lecture Hall.**—What is the best position for seats in a lecture-hall, and why?—S. H.

[6305.]—**Dip Traps.**—Are dip traps good means for trapping drains?—S. H.

[6306.]—**Breaking Weight of Cast-Iron Column.**—What is the breaking weight of a cast-iron column, 4½in. outside diameter, 12ft. 8in. long, 1 3-16 metal?—Iron.

[6307.]—**Compass Point.**—In setting out a church, should the magnetic or polar north be used? If polar, what is the variation?—Due-East.

[6308.]—**Cemetery.**—What is the usual distance kept between graves? Also between the rows back and front?—Due-East.

[6309.]—**Specifications for External Plaster Work.**—I shall be glad if some fellow-reader will inform me whether there is any work published giving specifications for external plastered and coloured stucco work, &c., with method of application?—Stucco.

[6310.]—**Heating by Hot Air.**—Will some of your readers be kind enough to say what is the best book published on heating by hot air? Also, what is the best way to test the quantity of air passing through a hot-air chamber? Also say if there is any means of heating stoves by gas for warming public buildings?—E. J. G.

[6311.]—**Plaster Coves to Eaves.**—Will any of our practical readers give their opinion on the following:—I am constructing a cove, and am at a loss to know what materials are best suited for outside work of this kind. As I notice in some coves cracks, and the colour is anything but a pure white, I want mine both white and free from cracks.—Young Student.

[6312.]—**Wood Beam.**—It is desired to strengthen a wooden beam in a store in order that it may carry greater weights. What would be the best means of effecting this without removing it or placing supports under? Some of your correspondents may have had experience in such a case. The beam is 10½in. × 8½in., and the span in the clear 13ft. 6in.—Qua.

[6313.]—**American Barrel.**—Can any reader say how many English gallons of water are contained in an American barrel of water?—W. G. S.

REPLIES.

[6290.]—**Surveyors' Charges for Quantities.**—It is usual, when a builder employs a surveyor to take out quantities for him, to make some arrangement that he is paid a small percentage if the work is lost, and the usual commission if the builder gets the contract. The surveyor could hardly legally recover the usual commission for work not carried out, though he would, no doubt, endeavour to do so, and the builder would be subject to the uncertainty of the law.—G. H.

[6295.]—**Joists on Girder.**—In a similar case, where I did not like to trust to a small bearing, I had stirrup-irons made, pasing over the upper flange and clipping it, upon which to rest the joists. Or they might be secured in their places by having wrought-iron straps made to clip the upper flange of girder, and to screw at the other end to the joist.—G. H. G.

[6296.]—**Damp Walls.**—There is little doubt that the discolouration proceeds from damp, and the only remedy is to batten or to knock off the plaster and cement. Perhaps there is no damp-course. If not, one should be inserted.—G.

[6298.]—**Party-Wall.**—The following are the rules as to exercise of rights by building and adjoining owners. (1.) "No building owner shall, except with consent of the adjoining owner, or in cases where any party structure is dangerous, in which cases the provisions hereby made as to dangerous structures shall apply, exercise any right hereby given in respect of any party structure unless he has given at least three months' previous notice to the adjoining owner by delivering the same to him personally, or by sending it by post in a registered letter addressed to such owner at his last known place of abode." Another rule says, "No building owner shall exercise any right hereby given to him in such a manner or at such a time as to cause unnecessary inconvenience to the adjoining owner." A note to this clause is appended by Mr. Paterson, in his edition of Woolrych's Building Act, to the following effect: That it does not impose on an owner pulling down a building and party-wall, any duty to protect by hoarding or otherwise, and "under the present Act the building owner is not bound to pay for damage necessarily done to the premises of adjoining owner. The remedy of the adjoining owner, if any, would be by action." In the case mentioned by "Surveyor," the damage is slight. It would appear also that no notice is required before removing a building, if the party-wall is not disturbed.—G. H. G.

[6299.]—**Felt on Church Roof.**—Good felt would not rot off as asserted. Much depends on its quality, and also the mode of laying it. It is, doubtless, better to give a space for circulation of air between the boards and the felt and slates.—G. H. G.

STAINED GLASS.

Felstead.—A memorial window has just been fixed at Felstead School Chapel, to the memory of the late Lieut. Hamilton. This young officer, it will be remembered, fell at Cabul while leading a charge in defence of the Embassy after the death of Major Cavagnari. The window has been presented by the scholars on the foundation. The window is a three-light, containing in the centre the figure of Abraham; and on either side the subjects of the rescue of Lot and the sacrifice of Isaac. The window was carried out by Messrs. Gibb and Howard, of London, under the supervision of Mr. F. Chancellor, architect to the school.

STATUES, MEMORIALS, &c.

The Royal Historical Society.—In this Society's Rooms last Friday evening, a number of members assembled to present to Lord Aberdare, the president, a terra-cotta bust of himself, from the studio of Mr. Henry Harvey, sculptor, a Fellow of the Society, and a pupil of Dalva. Mr. Harvey won the Goldsmiths' prize in 1879 for the best model design. Dr. Zerffi made the presentation.

LEGAL INTELLIGENCE.

Important to Builders.—George Henry List, builder, of Stafford House, Clapton-park, appeared at Highgate Police-court, on Monday, to answer several summonses charging him with having failed to give notice to the Finchley Local Board of Health that he was going to cover the foundations of a house, with having erected a house having two external walls of insufficient thickness, and with building a house without first depositing plans with the Board.—Evidence was given in support of the summonses by two surveyors, Mr. Brooking and Mr. de Papé, and the defendant applied for an adjournment on the ground that the summonses did not signify what houses the Board referred to, and he was, therefore, totally unprepared to meet the case. He wished to say that he had no desire to evade the by-laws of the Local Board, but was, on the other hand, most willing to carry them out to the letter.—Mr. Bodkin said that the summonses were perfectly plain. He should impose a penalty, but it would not be imposed for a month, and if in the mean time defendant complied with the by-laws, it would be a very nominal one, but he must pay the costs of the prosecution, £9 11s.—The money was at once paid.

Increase in Value of Property.—An arbitration case has been part heard at Bradford, relating to the value of two shops fronting William Brown-street and other adjoining property in Livesey-place, which the Corporation are about to acquire under compulsory powers from Mr. J. G. Martin. Mr. Edward Mills is the umpire, and Mr. Ellis and Mr. W. H. Weightman are arbitrators, and the inquiry was held on the 6th and 20th inst. The property, comprising 553 5-9 square yards, as claimed, and, according to the Corporation surveyors, 446 square yards, was purchased by Mr. Martin at an auction in August, 1877, for £4,550, and remained in the same condition as when purchased. The claimant's three valuers—Mr. Thomas Clarke, Mr. Owen Williams, and Mr. Robert Wylie—deposed that the property was worth £10,806, £12,178, and £10,962, varying from £18 to £20 per yard. On the part of the Corporation, Mr. Cornelius Sherlock, Mr. W. H. Picton, and Mr. Edmund Kirby, made valuations of £4,733, £4,736, and £4,722. The arbitrators and umpire have postponed their decision.

LATERAL SUPPORT OF ADJOINING LAND.—THE COMMISSIONERS OF PUBLIC WORKS AND BUILDINGS AND DALTON v. ANGUS.—This case came before the House of Lords on November 18th. It is an appeal brought by the appellants, the defendants below, against an order of the Court of Appeal reversing a decision of the Queen's Bench Division, setting aside a verdict in favour of the respondents, the plaintiffs below. Sir John Holker Q.C., Mr. Hugh Shield, and Mr. A. Gathorne-Hardy appeared for the Commissioners of Works; the Solicitor-General and Mr. Wheeler for the appellant Dalton; and Mr. Littler, Q.C., Mr. Gainsford Bruce, and Mr. Ridley for the respondents. The respondents, Messrs. Angus and Company, are coachbuilders at Newcastle-on-Tyne. In 1849 they converted a dwellinghouse in the Westgate-road into a coach factory and warehouse. In the process of conversion they removed the internal walls of their building, and erected on their own soil, close to and in contact with the adjacent premises, since purchased by the appellants, the Commissioners of Works, a large stack of brickwork serving the twofold purposes of a chimney-stack and of a support to the main girders which had to be put in to sustain the floors. These girders were inserted into the stack on the one side and into the respondents' wall on the other, and formed the main support of the upper stories of the factory. The respondents made these alterations without any direct grant from the owner of the adjoining premises of any right of lateral support, or any assent on his part to the use of such support or knowledge that the same was in fact enjoyed. The appellants, the Commissioners of Works and Public Buildings, having purchased the adjoining house in order to erect a Probate Office on its site, contracted with Mr. Charles Dalton, the other appellant, that he should execute the proposed works for them. By the contract and specification so entered into it was provided that the contractor should erect and complete the work and all things necessary to be done in and about the same in a thoroughly substantial and workmanlike manner, conformably to the specification and general conditions, and that he should shore up the adjoining buildings and make good all damage that might be caused thereto during the progress of the works. Mr. Dalton, in the course of the execution of the work, excavated the ground adjoining the respondents' premises, leaving a thick pillar of clay round the respondents' stack of brickwork for its support, and also placed shores to support the respondents' building. Notwithstanding these precautions, however, the ground beneath the chimney-stack gave way, and the respondent's building, losing its main support, fell. The respondents thereupon brought an action against the appellants (the Commissioners) and the contractor for the loss occasioned by the fall of their building, which was tried at the Newcastle Summer Assizes, 1876, before Mr. Justice Lush and a special jury, when a verdict was found for the plaintiffs, with £1,943 damages. On the case coming before the Queen's Bench Division for judgment, the Lord Chief Justice and Mr. Justice Mellor, Mr. Justice Lush dissenting, decided that the plantiffs had no right to the lateral support of the adjacent soil, and gave judgment in favour of the defendants. That judgment, however, was reversed by the Court of Appeal, consisting of Lord Justice Cotton and Lord Justice Thesiger, Lord Justice Brett dissenting. The appeal from the judgment of the latter Court was partly argued before the House of Lords in November last, when their lordships directed that the cause should stand over until the learned Judges could attend to assist the House with their opinion on the questions of law raised. Sir John Holker, Q.C., on the 18th inst., in arguing the case on behalf of the appellants, contended that no user, however long, could give a right to lateral support. The right to such support might be acquired by express grant, or in the event of the adjoining owner contracting not to disturb his neighbour's support, but it could not be acquired by mere prescription or by the presumption of a lost grant, inasmuch as the adverse owner would have no means of preventing such a right, if it could exist at law, from being acquired. He submitted that the cases relating to the right to light outside of the Prescription Act had been decided upon erroneous principles, and he should have to ask their lordships to overrule them or to decide that there was no analogy between the right to light and that to lateral support.—Lord Blackburn: The cases you ask us to overrule range over the last 150 years, if not even from the time of Queen Elizabeth.—Sir J. Holker hoped to be able to convince their lordships that, independently of the Prescription Act, there was no common-law right to light given by 20 years' user. The learned counsel then proceeded to cite the "Windmill case" (Webb v. Burr," 10 "C. B.," N. S. 268). in which it was held that the owner of a windmill, which had stood for more than 20 years, had no ground of action against an adjoining owner who erected a house in such a position as to interfere with the access of the wind to the mill; the "Smoke case" ("Bryant v. Lefevre," "L. R.," C.P.D. 173), in which it was held that 26 years' user gave no easement which prevented a neighbour from so building as to cause the adjoining owner's chimney to smoke; and the "Confectioner's case" ("Sturges v. Bridgeman," "L. R.," 11, C. D., 852), in which it was determined that a confectioner had not acquired a right by 20 years' us r to use an engine which disturbed a surgeon in his newly-erected consulting-room. The learned counsel also referred to the case of "Humphreys v. Brogden" (12 "Q. B.," 737), and to several American cases. Even if their Lordships should be of opinion that a right to light could be acquired by 20 years' user, he contended that, inasmuch as the light could be intercepted, while the lateral support could not be, there was no analogy between the two rights. The Legislature, by dealing with the question of lights, specially showed that these prescriptive rights ought not to be extended further. He further submitted that in any case the Commissioners were not liable for the negligent act of an independent contractor. The arguments on behalf of the apellants were resumed on Friday last by the Solicitor-general, who appeared for the contractor, Mr. Dalton, and submitted that the right claimed by the respondents, would only be acquired, if at all, by express grant, prescription, or the implication of a lost grant. Acquiescence might well be implied if a man submitted to that for which he had a legal remedy, but how could a man be said to submit to a neighbour obtaining a right to lateral support? Was he, in order to prevent his neighbbour acquiring such a right, to dig out his land every 19 years and let his neighbour's house fall into the hole? The law as to ancient lights stood upon an anomalous footing, but he admitted that it was too well settled now for any attempt to disturb it to be successful. The right to lateral support, however, was not patent, like that to light. No practical inconvenience had resulted in America from its having been held that such a right could not be acquired by user. He further submitted that there was no evidence to show that the original grant had been lost. On Monday Mr. Littler, Q.C., on behalf of the respondents, submitted that the respondents' house and factory having been in existence since the year 1849 without alteration, they were entitled as of right to have them supported by the soil adjacent thereto without interruption by the apellants. The fact that the premises had been in existence so long raised a presumption that they were entitled to that right, and such presumption had not been rebutted. Either the apellants had had full notice of the support in fact enjoyed by the factory, or else the *onus* lay upon them to show that they had not had such notice. On the question of the liability of the employer or of the contractor, he submitted that inasmuch as the work authorised by the Commissioners of Works was in itself work from which injury might naturally be expected to be caused to the respondents' factory, the Commissioners could not discharge themselves from their legal liability by employing a contractor to execute the work. On Tuesday Mr. Ridley addressed for the respondents. At the conclusion of the arguments, the Lord Chancellor put the following question of law to the learned Judges: First, has the owner of an ancient building a right of action against the owner of land adjoining if the latter disturbs his land so as to take away the lateral support previously afforded by such land? Secondly, is the period during which the plaintiffs' house has stood under the circumstances stated in the case sufficient to give them the same right as if their house was ancient? Thirdly, if the act done by the defendants would have caused no damage to the plaintiffs' building as it stood before the alteration made in 1849, is it necessary to prove that the defendants or their predecessors in title had knowledge or notice of these alterations in order to make the damage done by their agent in removing the lateral support after the lapse of 27 years an actionable wrong? Fourthly, if so, is it sufficient to prove knowledge or notice of the fact that such alterations were made, or is it necessary also to prove knowledge of their effect in causing the buildings so altered to require a degree of lateral support from the adjoining land which was not before needed? Fifthly, was the course taken by the learned Judge at the trial of directing a verdict for the plaintiffs correct, or ought he to have left any question to the jury? The learned Judges having asked for and obtained time to consider their opinions, the further consideration was adjourned *sine die.*

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A new organ was opened in the English Presbyterian Church, Brunswick-square, Camberwell, on Thursday week. It has been built from the designs of Mr. J. R. Murray by Messrs. Maley, Young, and Oldknow, of St. Pancras, and contains a great organ and swell organ, each of 56 notes, a pedal organ of 30 notes, and various accessory movements. The front of organ is composed of lower octaves of double and open diapasons.

Our Office Table.

ON Monday night the first of the Cantor Lectures, in connection with the Society of Arts, for the present session, was delivered at the Society's house, John-street, Adelphi. The subject was "Some Points of Contact between the Scientific and Artistic Aspects of Pottery and Porcelain," and the lecturer was Professor A. H. Church, M.A. Oxon, F.C.S., who fills the chair of Chemistry at the Royal Academy. Opinions differed, he said, as to the effect of scientific knowledge on art manufactures. Some appealed to the consummate beauty of certain Greek vases to show the needlessness of a knowledge of chemistry and physics for the production of the most perfect ceramic works, and even went so far as to argue that it was sure to end in artistic disease—nay, in the death of true beauty. Science, they told us, crushes imagination and poetry out of man's handiwork. On the other side, the devotees of Science insisted she must be mistress. Nothing could be satisfactory save mathematical precision. Happily, there was a third group of persons interested in art manufactures, who were prepared to welcome help from every quarter. They called in the chemist to analyse old materials and hunt up new, and they prized highly traditional knowledge and skill which had handed on from age to age the sense of beauty; but they would not bear with dull uniformity and stagnation. They might wish to chasten, but never to quench, the individual originality, which could bear no more to be everlastingly moulding the same pot than the true painter could endure to be always turning out replicas of even his best pictures. Professor Church explained that his purpose in the course of his lectures was to note the relations between the chemical and the physical qualities of some kinds of earthenware and china, as well as their artistic qualities as apprehended by the trained eye.

AT Wednesday night's meeting of the Society of Arts, Sir Henry Cole, K.C.B., in the chair, a paper on "The Influence of Barry on English Art," was read by Mr. J. Comyns Carr. It began with a reference to the introduction to James Barry in 1788 of the young Irish artist, Martin Archer Shee, who 40 years afterwards rose to be President of the Royal Academy. Starting from this introduction, Mr. Carr remarked on the contrast between the more supple and brilliant Irishman and his fellow-countryman as reflected in their several careers. Barry's biography was briefly sketched, as furnishing the clues alike to his strength and his weaknesses. His absorption in his studies, from his early abandonment of a seafaring life for the profession of a painter, was all-devouring. He often sat up all night to his work. At 20 he painted that picture of St. Patrick's first landing on the Cashel coast which attracted Burke's attention, and led to a lasting friendship between the great statesman and himself. Mainly through Burke's generosity, Barry visited Rome. The painter's relations with Sir Joshua Reynolds, who took a genuine interest in his career, were also touched upon. With all Barry's many and serious faults, there was in the whole history of art no more notable instance of absolute devotion to an ideal. His quarrel with the Academy brought before us both the best and the worst sides of the man's nature. But he was dealt with too harshly. He might have been justly deposed from his chair, but he ought not to have been expelled from the body of the Academicians. The lecturer said he would not on that occasion attempt either to expound the merits or mark the defects of Barry's painting. His most important work was before the eyes of the audience. The discussion on the paper was opened by the chairman, who assigned to Barry very high rank, as compared not only with his contemporaries at home, but also on the Continent.

MR. WILLIAM M. WOOLLETT, of Albany, a well-known American architect, is dead. The father of the deceased was employed, as architect or superintendent of construction, upon the Delavan House, as well as other important buildings, twenty or thirty years ago. The son's work was for the most part of a different character, his taste inclining him to the study of problems more modest but perhaps of greater artistic interest. The book which he published not long before his death, entitled "Old Homes Made New," illustrates the success which had attended his efforts in a special branch.

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 3, 1880.

THE "NATURE THEORY" AT THE BAR OF FACT.

IN an age like this, when scarcely anybody, except the scientific man, uses his own eyes, and when most people are ready to act on any theory that is plausibly and eloquently set forth, there can be few greater services than that of calling popular theories in question. If they are true, they will only gain strength by examination, and if they are wholly or partially false, the sooner they are torn to pieces the better. A theory of the latter class we believe to be that which asserts that all the arts, and architecture amongst them, should be based on the imitation of Nature. Nearly thirty years have passed since the idea was first imposed on the world by Mr. Ruskin. His eloquent declamation has been echoed and re-echoed by the great majority of art-critics ever since; but, in architecture at least, the first example of any permanently satisfactory work done by acting on it has yet to be seen. The whole affair has begun and ended in talk. "Go to Nature—copy Nature," has been the cuckoo-cry in nearly every address to art students, architects included, for many years; but no architect and no outsider that we know of has done any architectural work worth looking at by acting on the advice. This, of course, may be the fault of modern architects, so the best plan will be just to turn back and see how far ancient architects copied Nature.

Before doing this, however, it may be well to state once more, plainly, and side by side, the "Imitation of Nature" dogma, and the tentative hypothesis which we submit as being nearer to the true facts of the case. Art, says Mr. Ruskin, is the expression of man's delight in God's work: as long as men copied that work, architecture advanced; as soon as they copied their own, it declined. Our own generalisation will be in much humbler language. It is as far from our wish as from our power to treat of matters like architecture in the style of the ancient prophets; all we aim at is to see things as they are, and to help others to see them so. Doing this, it appears to us that the one indispensable thing in all art, from the lowest to the highest, is arrangement; the putting things together so as to affect the mind by contrast, by repetition, or by a multitude of other devices. One art puts one kind of things together, and another art another kind. The things may be words and ideas, as in poetry; they may be imitations, more or less remote, of Nature, as in painting and figure sculpture; they may be inventions, as in some of the best architecture and ornament; they may be copies of human work, as in some of the best architecture also; or they may be natural objects, as they often are, in the elementary forms of art devised by uncultivated races. There are arts to which the imitation of Nature is essential; there are other arts to which it is not essential; and of these last, architecture is one. We differ from Mr. Ruskin, first, in asserting that the highest and purest forms of architecture do not necessarily copy Nature; and, secondly, in asserting that they may, and generally do, copy human work. It is a question about facts, which ought to be easily decided; and as the Nature-theory seeks to found itself mainly on Gothic practice, by Gothic buildings it shall be tried. We shall make no special search for examples to upset the one theory or support the other; the building selected shall be a fair specimen, and one of those generally looked upon as the best of their kind.

As an example of pure and refined Gothic, then, of that early period when men, as Mr. Ruskin assures us, copied God's work and not their own, take Salisbury Cathedral. Look at it first in mass, and then, since time would fail to dissect the whole—take some one portion complete in itself, and examine the detail. It would require a vivid imagination indeed, to trace a likeness between the cathedral in mass, and any natural object whatever. The long, straight, level lines of the ridges are like none which Nature delights in. They might have been curved like the profiles of hills, or jagged like those of distant mountain chains. The roofs might have been rounded, or ogeed, or treated in a thousand ways which Nature suggests by her ever-changing forms; but as a matter of fact they are simply gabled; made of two straight lines meeting at an angle. So it is with the general composition throughout. No doubt the central tower and the arrangement of transepts and projections give a sort of pyramidal massing to the whole; and anyone determined to find resemblances to Nature might see in this some faint and far-away imitation of a mountain. A mountain is highest near the middle and lowest near the sides; so is Salisbury Cathedral; and so, too, are a great many other things which have to stand firm and to look firm. We need not make a pilgrimage to Switzerland, or even to Scotland, to learn that a pyramid is a form of great stability; and, without thinking of Alpine peaks, we may naturally enough give visible stability to our work by piling it up in somewhat of a pyramidal form. This is about the nearest approach to Nature-copying which we can see in the general massing of Salisbury; and if architecture really lies in copying of this sort, there is far more architecture to be seen at Stonehenge. Let us pass to the details: the north transept will be a convenient place in which to examine them.

The north elevation of this transept consists, in its central part, of three stages, a plinth, and a gable. It is a striking and pleasing example of arrangement. There are large double buttresses at each angle, and, in the two lower stages, a couple of smaller buttresses, dividing the front into three parts. Each of these parts, on the stage next above the plinth, is occupied by a fine single lancet window. Each part on the story above has a two-light window; two lights, that is, under one arch, with a circle or foiled figure between the arch and the heads of the lights. The minor buttresses end here, with gabled heads. The third stage is filled with an arrangement made up of a larger two-light window, two panels of an arcade on each side, and a blank quatrefoil above each pair of panels. Finally, the gable has a still richer and more effective arrangement. Below the coping is a bold moulding, taking the form of a cinquefoil arch, and enclosing all the space beneath; and into this cinquefoil are fitted the heads of two two-light windows, and a richly-cusped spherical triangle. In all this, there is surely a great deal, an overwhelming majority, which is, in no sense, imitation of Nature; there is much which is human invention of a high and successful sort, and there is something, by no means inconsiderable, which is pure imitation of human work. We may grant, if anyone likes to contend for it, that the plinths and string-courses have some resemblance to the lines of stratification or bedding in a rock-face. A stratified rock is built up of layers; so is a cathedral; and a certain amount of resemblance is therefore inevitable. But we do not find that Nature in any of her productions, animal, vegetable, or mineral, makes a usual practice of marking off the base from the superstructure by distinct lines, analogous to a plinth. Rocks, oftener than not, rise in lines or sweeps from base to summit; trees pass from the spreading root to the slender stem with no set off to mark the transition, and the same is true of the feet and limbs of animals. A plinth is a human invention. Originally it seems to have been the top course of the many courses of footings, which, for mechanical reasons, have to form the base of a wall. A builder who sought to do as Nature does, would either have kept this top course below the ground, as Nature is apt to do in rocks and precipices, hiding it out of sight, or would have eased it off into a gradual and graceful curve, as she does with the supporting limbs of trees and animals. The plinth, in short, would have never existed at all, had even the most remote and generalised imitation of Nature been desired, much less if that constant study and minute copying which we often hear of had taken place in reality. It is, however, one of the most essential, most important, and most conspicuous features in almost every first-rate Gothic building, from the earliest to the latest times—a piece of architecture proper, of beautiful and appropriate human design. Next to the plinth come the lancet windows, their heads being, of course, pointed arches. The pointed arch, we have heard over and over again, is beautiful, because it resembles a leaf-form. The resemblance is a distant one, and if there is any truth in the theory, the arch would be improved by making it a closer copy. Leaf forms are generally of varying curvature, not made up of circular arcs; more frequently than not, they are reversed or ogeed towards the point. Let anyone build a pointed arch to the exact curve of the most beautiful leaf he can find, and then see how he and other people like it. Let him look at those pointed arches which in the Later Gothic are reversed or ogeed at the summit, and are by so much nearer to Nature, and see whether they are better or worse than the earlier lancet ones. If copying Nature is the royal road to success, it is strange that the more closely we copy it the worse our work should get. Let us leave for a moment this theory, which no eloquence less than Mr. Ruskin's could ever have imposed on people who go about with their eyes open, and try calmly to write down what in this transept of Salisbury, we really see before us.

Starting from the ground, then, we first come upon a boldly-moulded double plinth or base-course: a piece of necessary construction, exhibited, and made architectural. It is wanted mechanically, to widen the wall out, and make it stand securely. It is wanted architecturally, to bind the whole building into one, and to set off by contrast the vertical lines of the buttresses and windows. It is moulded to make it more conspicuous, and to add to its beauty, on a near view, by the gradated or contrasted lights and shades of the rounds and hollows. Above the plinth, we come to the lancet windows. Their heads are pointed, because, if we go back to the origin of the thing, it was found, about the middle of the 12th century, that a puzzling vaulting-problem could be best solved by using pointed arches in the groining; and because it was afterwards felt that, for the sake of artistic harmony, pointed arches ought in that case to be used everywhere. The heads of the lancets are moulded for the same reason that the plinth is; but they are also recessed in orders. Why is this? This recessing, in the case of a small arch, is a copy of an architectural invention meant at first for large ones: an example of that forbidden thing, the imitation of human work for ornament. In a small arch, such as that of a lancet window, there is no practical use or constructive reason for building it in recessed orders; and in many small windows the two or more orders are actually cut out of one and the same stone. But in large arches there is such a reason: the inner order or ring being once turned by means of a light centering, it forms itself the centering on which the next order can be turned, and this again the centering for the next. This plan once adopted, it was with the building of arches in recessed orders or rings, as it was with the building of them in a pointed shape: the form employed in the main arches for use was copied in the minor ones for ornament. Returning to our lancet window, we find that each order of the arch rests upon a capital, and this upon a jamb-shaft and small column and its base. More correctly speaking, it appears so to rest. In point of fact, the jamb-shaft, or imitation column, is as pure a piece of ornament as a crocket, or a dripstone termination—and the proof of this is, that in hundreds and perhaps thousands of cases the jamb-shafts have fallen out of old doorways and windows, and yet the arches stand as well as ever. Every one of the multitude of jamb-shafts which adorn all first-class Early English buildings, is a plain, unmistakable imitation of human work used for ornament—a small copy of a column, just as the favourite decoration of Perpendicular buildings is a small copy of a buttress. Take away from any great Gothic building, either Early or Late, all the instances in which human work is copied by way of ornament, and you leave little more than a well-proportioned example of clever engineering.

We have not yet spoken of the transept buttresses, either principal or secondary. These are not copies from Nature, whether near or remote; neither are they, as a whole, imitations of other human work. They are beautiful and useful pieces of architectural invention; details of that class whose skilful arrangement goes to make up the highest type of architecture proper. Their beauty lies partly in their obvious fitness for their purpose; partly in the gradated light and shade given to them by their splayed angles; and partly in the artistic management of their offsets, and in their general excellence of proportion. All this beauty is enhanced tenfold by the arrangement of the transept end generally, which makes each buttress look exactly the right thing in the right place; and emphasises its verticality by the contrast of strings and plinths, and its massiveness by the contrast of delicate tracery. Even so pure an example of invention as the buttress, however, could hardly be finished without some little bit of imitative human work; and we find its highest weathering or capping to be a gablet and finial. This weathering might have been, like the rest, a mere slope of one sort or another; it might have been a copy, close or far away, of a thousand natural forms which would have lent themselves to its machanical purpose; but as a matter of fact, it is an imitation, and is meant to look like an imitation, of a gabled roof-end. In the finial which adorns it, we come, for the first time, to something that can be clearly recognised as natural; yet even here the foliage is no direct copy. The carver did not imitate—as modern naturalistic carvers do—a bunch of maple leaves, or oak-leaves, or strawberry-leaves, just as they grow, or just as they look when they have ceased to grow. He studied Nature, on the contrary, to see how she expresses life, and invented his leaf-forms himself. Treatise-writers tell us that Early English foliage is copied from the Water-avens—a rather scarce, wild plant which few of our readers may ever have seen. Those who have seen it, by the burns of Northumberland and elsewhere, will readily confess that, whether it suggested a conventional type to 13th-century workman or not, it would have been worth no more to 19th-century ones than any other plant they have tamely copied. The trefoil leaves of lancet-work may have been imitated from it, as they may from the Wood-sorrel, or the Clover; but the irrepressible life and growth, which fill all that work with strength and crispness and spring, is not to be found in this plant more than in others. It seems to be a study from many plants, at a time when they are first bursting from the ground after winter; but not a copy of them, even then. On the contrary, it is a tenfold exaggeration of all by which they manifest power and vigorous life. The Early Gothic carver made it his business to discover what expresses life, growth, and freshness; and having once found the secret, he applied it to whatever forms it pleased his imagination to devise. He had got hold of the life of Nature, so that his buildings look alive and growing with it to this very hour. He could well afford to leave his successors of six centuries later the lady-like amusment of tracing-off leaf-edges and trying to cut out fern-profiles in stone.

We have little space left to analyse the rest of our selected example. In the third stage, and the transept gable, are several two-light windows, with cusped circles in the heads; there is also a sort of gigantic cusping below the raking lines of the gable, and there are some irregular, unpierced quatrefoils, which serve to fill blank spaces of walling. The cusped circles may be compared, no doubt, to a plan or top view of certain flowers, having as many petals as there are foils in the design. Gothic foliations, however, are, in all but a few rare and exceptional cases, circular in their curvature; flower-petals are seldom or never so. Here, as elsewhere, the nearer the imitation is to Nature the worse it becomes as art, and, if there is any reminiscence of floral outline in the case, it is, and ought to be, only a very slight and distant one. The gable-cusping, too, in which there is no sort of reminiscence of the kind, is quite as effective and beautiful in its way as the circle-cusping. Below the gable are the arches of a blank arcade, carried, or rather appearing to be carried, on shafts, with caps and bases; and here, of course, are more imitations of human work, by way of ornament; while, on the upper pinnacle, behind the west buttress, we find yet another. A pinnacle is simply a mass of masonry put above a buttress to steady it by its weight; to aid the buttress, in short, to resist the outward thrust of the vaulting. There is no structural reason for making it into one shape rather than another, and here, if anywhere, a builder who felt it to be the essence of his art to imitate Nature, could, and would, have given to that feeling the most boundless freedom. What he really did, in this case, was to cut the pinnacle into a cluster of eight imitative columns or shafts, with caps and bases; to cover them with an imitative roof or spire, and to put along each angle of this imitative spire an imitative roll, copied from those of leadwork. Summing up the whole results of our survey, then, we find close copies of Nature absolutely nowhere. We find the nearest approach to copying in the smallest and least important details, such as the finials, and a far-off and doubtful approach to it in the cusped circles of the window-heads. We find unmixed human inventions in the buttresses, the plinths, the string-courses, the arches and the gable; in all the great and important features, namely, of the whole design. Lastly, we find copies of human work for the purpose of decoration almost everywhere; in the jamb-shafts, in the arch-orders of the lancets, in the blank arcades, in the gabled buttress cappings, in the columnar pinnacles, in their spire-like heads, and even in the very angle-rolls which adorn them. This, be it remembered, was in that pure and virtuous period when, Mr. Ruskin tells us, that architecture rose higher and higher, because men copied God's work, and not their own. "Clear your mind of cant," said Dr. Johnson; and Mr. Ruskin's most distinguished friend has never wearied of repeating the advice. It would be well for us all to take it, and, in spite of plausibility and spurious pietism, to try manfully at seeing things as they are.

PONTEFRACT TOWN-HALL.

As we stated last week, about 59 designs have been sent in for the alteration of this old town-hall at Pontefract. In the conditions issued to competitors (which appear to have been very loosely worded) there appears to have been no particular style of design specified in which the work was to be carried out, and, consequently, there is the same difficulty in deciding which is the best design. In selecting a few of the best for our criticism this week, we do not arrange them in order of merit, for the reason we have stated, but just name a few out of which the referee (Mr. George Corson, of Leeds) will probably select those which are to take premiums.

On the whole, the designs are not of a very high order, but still better than could have been expected for such premiums. There is a great similarity in all of them in consequence of a large hall being required by the conditions, which furthermore limit the cost to £7,000, inclusive of architect's commission.

"Renaissance" shows on the ground-floor a large vestibule adjoining the old hall in Bridge-street, with a recess for a fire-engine and constables' chambers, and magistrates' room on one side and town-clerk's on the other, with a council-chamber in the corner having a separate entrance into Baxter-gate. Adjoining this are several rooms used as committee-rooms and rooms for borough-surveyor. Opposite the main entrance is a fine new staircase (with lavatory and w.c. conveniently near thereto). The staircase to first-floor leads direct to the assembly-room, and the old town-hall is left intact. There are retiring-rooms and w.c.'s in a convenient position and well lighted. The section through the hall, which is well executed, shows the interior off very well, having granite pilasters around, and coved cornices. The elevation shows a Queen Anne design, having a circular-headed door with octagonal tower over. The windows are large, with label-moulds over, and the side-entrance doors are arranged in the windows, which are used as fan-lights and side-lights. There are also arranged dormers with circular windows and segmental-headed windows alternately along the elevations to Baxter-gate and Bridge-street.

The design by "Straight and True" has certainly the merit of being conceived on the right principle, as the office for the town-clerk and borough-surveyor are located at the side of the building, and could be made to form one suite of rooms. While the main entrance is arranged in Bridge-street with a fire-engine room and a police-office on one side, the other side is occupied with the other necessary offices, and at the back of these, lighted from the yard, is a building arranged for a kitchen or post-office. Facing the principal entrance, and connected to the old entrance, are the stairs, leading to the hall by two large entrance-doors with retiring-rooms on each side. The old building is not touched, thus reducing the expense. The elevation to Bridge-street shows a tower over the entrance door (which has a semi-circular head, and is very wide and well proportioned), and in the centre, between the tower and the angle, is a Queen Anne window to light the hall, carried into the roof in the form of a gable. The Baxter-gate frontage shows a centre two-light window, and a two-light window on either side, forming dormers into the hall, with square windows to the ground-floor.

"Dum Spero Spiro" has its old hall on the right of the new main entrance converted into a county-court, with a post-office arranged to the front of the present building, and under the old assembly-room. The offices are otherwise very like the design marked "Straight and True" in the main features. The town-clerk's office adjoins the entrance, and the Baxter-gate frontage is taken up with the borough-surveyor and constables' offices, and a separate entrance for the police. No arrangement is made for a fire-engine, and the large hall is situated over the entire new building. The elevation is Classical and of very good proportions, very similar to the Conservative Club at Manchester, with a panelled ground-story, and columns above two stories high, colonnade over, with vases; every part seems well-proportioned. The entrance, with a semicircular head and carved spandrels, is very rich. Windows with circular heads are placed between the columns, and a tower is placed over the main entrance, which would better have been left out. The quadrant corner at the junction of Baxter-gate and Bridge-street, is very effective.

The drawings sent under the motto of "Queen Anne" must also be placed among the good designs. The plans are very similar, in all respects, to the first-named, and the elevations, which are well got-up, are very characteristic of the motto. We can also speak well of a very good design by "A Venture," in which the chief entrance is in the footpath in the centre of the new wing. The old wing is altered to be suitable for post-office and rooms for the police, and are connected to the new entrance in the footpath; while in Baxter-gate are arranged the committee-rooms, connected with an ante-room, which no other design shows, and at the side the town-clerk's office, and office for the borough-surveyor. The chief drawback, however, to this design, and it is a serious one, is the defective lighting, as it is found necessary to light the town-clerk's general office and the County-court and County-court office by borrowed lights, and in the judges' room this is not attempted, and neither light nor ventilation can be had. The chief merit of the design is its good elevation, of a Classical character, with effective windows on the ground-floor giving character to the whole, while the eleven lofty windows over-emphasise the position of the Town-hall. The tower in this design, unlike any before mentioned, is at the angle of Baxter-gate and Bridge-street, and this leaves room for a graceful gable in the centre of the front to Bridge-street, of the Queen Anne style (which, by the bye, is very prevalent in the designs), and has canopied windows to the first floor. "Ours" possesses many good points in composition, and has the main entrance-door in Bridge-street, which conducts to a hall connected with a corridor 12ft. 6in. wide, from which access is obtained to the committee-room, town-clerk's, and borough-surveyor's offices, and rate-office, which take up all the frontage to Baxter-gate. The lavatory and w.c. are well lighted, and a very efficient staircase leads direct from the principal hall on the ground-floor to the reception-hall, which is well lighted; also the retiring-rooms are formed at the end of the hall, which has the corners splayed off. The old town-hall is altered into a court, and the magistrates' room is parcelled out of the old circular room. There are three entrances to the hall, and w.c. and lavatory are handy. A plain Classical elevation is shown, which shows neat elevation without any superfluous carving (except on caps to pilasters) or other expensive work, exhibited on too many. Pilasters are arranged on each side of the door, and at equal distances on both fronts, between which couplet windows are placed, having circular heads. A good cornice is placed above this, and other pilasters are shown of great height above those of the ground-floor, between which are eight large circular-headed windows to light the hall. In the blocking course of the cornice above, the chimneys are arranged, and a tower, with a dome cap, surmounts all. This tower has a square basement, from which it is built octagonal on plan, with no apparent covering to the corners.

"Castle" is a good design. The entrance is placed in the centre of the Bridge-street frontage; the post-office is arranged in the old building at the front of the present building, and a passage connects the entrance to the new entrance. The borough-surveyor's office is, in this design, very properly put next the main entrance, and the town-clerk's offices, &c., occupy the Baxter-gate frontage. The staircase to the first floor is in part detached, and turning first to the right, is well lighted, and lands on the left above the first tread. A small alteration would be needed by making more than the one door shown, as when the corridors are crowded with dancers (for which purpose the new room is particularly required), great inconvenience would be experienced for want of a second door. Ante-rooms are shown at the end of the hall, connected with the ground by a private staircase, which leads direct to a door in Baxter-gate. The elevation to Bridge-street is excellent, with a broad, dignified character: a square-headed Classical door in the centre, and three circular-headed windows to the right, and two similar couplet windows on the left of the entrance, between which quarter-columns are placed. The first-floor windows display much real merit, and are loftier than those on the ground-floor, having also canopies over. Corinthian caps are shown on the columns and a cornice with a colonnade over is well relieved by the chimneys used as panels therein, while vases are placed at the ends. A very weak octagonal tower is placed over the door, which lacks character and spoils an otherwise good elevation. Another design by the same author shows similar treatment upon the whole, with a circular oriel on the first floor. There is an air of sameness about this design, and we prefer the one first noticed. Two competitors have chosen "1880" as their motto. The one in room No. 6 shows a wide entrance from Bridge-street, and a circular staircase to first floor. The old building is used on the ground-floor as police-office rooms, while above this, the room formerly used as a town-hall now forms a council-chamber. In the new building the ground-floor is taken up with the town-clerk and borough-surveyor's offices, and a committee-room, all facing Baxter-gate. No provision is made for post-office, or fire-engine, or kitchen. The assembly-room on the first floor appears to be the only one lighted from both ends as well as the front, and, by so doing, the old circular room is to be used in the proposed new building as a retiring-room. The elevations are broad Classic, with circular-headed windows and columns between; a plain blocking course is similar in many ways to the existing building, and allows a plain substantial job to be made of it.

If the people of Pontefract get any of the designs which we have noticed built, they will have no occasion to complain, although, with the building trade as depressed as it is in Yorkshire, we do not take such a despondent view of the idea of building what is practically but little more than one large room on the first floor, with the ground-floor utilised as corporation offices, for a sum of 7d. per foot cube, more especially as a great part of the building is rough work, not exposed or in the public street. Moreover, we have heard of buildings not far from Pontefract being erected at a much lower price per cube foot.

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NEW BUILDINGS IN THE CITY.

THERE are even yet some parts of the City that appear to have undergone little change since the great rebuilding in the 17th century. Houndsditch is one of these stagnant localities—still largely occupied by Jews and brokers. Aldgate is another old thoroughfare that has little changed since its gate was pulled down, and even Fenchurch-street yet retains traces of the architecture which followed the Great Fire. Here and there are indications of rebuilding. At the corner of Lime-street, a large site, having an area of 4,800 square feet, is to be disposed of for building, the plans of which have been prepared by Messrs. Clutton. In Gracechurch-street, adjoining Half-Moon-passage, the new Leadenhall Market is progressing, but the antiquary may find more interest in the remains of the Late corbels and stringcourses in the old stone well standing on one side of the site, apparently the remnant of a monastery. The wall shows the positions of seven corbels and two long stringcourses, and the lower part has the appearance of once having formed the side-wall to a refectory.

Cornhill shows a few signs of activity. The new building for the London and Lancashire Life Company and Fire Assurance Association will have an important frontage of stone. Coupled columns are introduced between the windows; the latter are of three lights, and have transoms, and the stone mullions are carved as balusters above the transom. Messrs. Colls and Sons, of Camberwell, are the contractors for the work. Just above, another striking building, in a style which we may call Neo-Grec—French in feeling—is to be seen, the most noticeable points about it being the windows, with their raking cornices inclosing a kind of Greek honeysuckle ornament, the rustications in the upper stories in alternate courses, the fret in the upper frieze and the panels between the lower windows. The details are wanting in refinement, and we may add that there are few styles which exact more thought and knowledge in their composition than this, and hence it will slowly win its way as a popular style for street architecture.

In a similar style, the new "Standard Life Insurance Office," in King William-street, deserves notice for the bold manner its architect, Mr. Stanley, has turned a very awkwardly-shaped site to account. From the Bank end of the street, the very acute angle of the building detracts much from the architectural effect as seen from this point; the building, indeed, has the appearance of a huge wedge or screen, which ingenuity has scarcely been able to disguise. The angle has been returned square, and is adorned with pilasters, but the sharply receding side-wall leaves it almost like a solitary structure. Walking down the street, however, this illusive effect is lost in the boldness of the façade. The elevation is nearly divided into two halves; the lower part forms a massive substructure, including a lofty entresol, with polished red granite pilasters running through both stories, surmounted by a massive entablature of the same material. The entresol is divided from the ground-story windows by a deep granite string incised with the Greek fret. Above, the composition is of two stories of stone, adorned by three-quarter columns of the Corinthian order, and supporting a deep cornice resting on consoles. The details and ornamentation are thoroughly Greek in spirit; the red granite pilasters are relieved by sunk ornament of conventional kind, and the capitals are enriched by incised ornament of the honeysuckle order. The angle of the building on the south side is canted, and has blank windows; these are also enriched by ornament of a similar kind. The fret band of granite that divides the lower story from the mezzanine gives support to the substructure, and the window reveals are enriched by carving in a quiet and refined manner. In the upper stories balconettes are introduced over the first-floor windows, and the faces of these are relieved by effective surface ornament of overlapping discs. There is a quietness and dignity in the general treatment and proportion that commends itself; the lofty basement adds much to the imposing quality of the façade, and the carving is carefully restricted to surface relief, and is neither obtrusive nor vulgar.

A narrow frontage is always a difficult problem to the architect. He has to provide for a plate-glass front and a tier of windows above; there is no room for interfenestral display such as columns or pilasters, and he has boldly to design the front without reference to treatises on Italian or Gothic, for he will find little to help him in the works of his predecessors. The common way of getting over the difficulty is to take a vertical strip from a palace—a bay, in short, and to make this fit the space. It is an easy method of overcoming the difficulty certainly, but it is not one the honest architect would adopt. There are few attempts that we know of in London which are not more or less slices of other designs. In Cheapside there are indications of improvement, and we remark a narrow stone front nearly opposite the Old Jewry, where an endeavour has been made, and not without success, to design a narrow front upon a rational basis. The façade is four stories in height above the shop. The breastsummer is supported on two red granite piers; on the first-floor is a corbelled bay window of two stories, rather flat, and this is finished with a balcony on the top. The mouldings of this bay die away against the square piers or jambs of the recess, which is carried up through the whole front, arched at the top below the parapet. Of the two upper stories, one is flat, recessed with windows opening out on the balcony, and the one above forms a shallow bay, the vertical angles of which finish and lose themselves under the soffit of the arched head. The details are plain; there is no carving, but the recess gives a pleasing variation of light and shadow, and the stone surfaces are broadly treated, the cornices having bold mouldings. Mr. R. Conder is the builder. Opposite to this building the mercantile architect may see a series of shops, forming the lower story of the newly-finished Mercers' Hall, where the "shop-front fitter" has been restricted by architectural limits. A series of red granite polished pilasters, with elliptical arches, have been filled in by polished oak shop-framing in a substantial manner; the entresol arrangement in the arched heads is satisfactory, though a little greater height seems to be wanted above the springing.

Passing from Cheapside to Ludgate Hill, Messrs. Samuel's "Sydenham House," by Messrs. Joseph and Pearson, claims attention for the florid carving to the façade, and the entresol design. Over a weak shop-front of attenuated iron stand Atlantes supporting carved trusses and a balcony. The façade is relieved by a slightly projecting bay, which is carried to the top. The windows of the entresol are divided by red polished shafts, with carved caps, and the arches are crowded with French detail of a very free and rococo character. We cannot certainly say anything in praise of the fenestration, or the ornament and profusely carved keystones over the principal windows; there is weakness in the small pediment over the centre window at the top, the cable enrichment of reveals is meaningless, and altogether the carver seems to have had uncontrolled liberty. On the summit three cupolas appear, though their purpose is not apparent. The design is less satisfactory than the same architect's work a few doors higher up. The new offices of the *Daily Telegraph*, in Fleet-street, may be mentioned as a new building since our last survey of this thoroughfare. Architecturally it is not remarkable; the Italian of the façade is of the kind the public have become almost satiated with, and the only good thing that can be said of it is, that the front is flatly treated and the projections reduced to a minimum. The coupled granite pilasters in the side piers over the ground-story look somewhat out of place below the panel-work above them. Two wide windows, with segmental pediments filled with carving, are the principal features. There is an official stamp about the lower office-windows, but the details are hardly of the kind to stand the smoke, soot, and traffic of Fleet-street.

The structures we have described fall under two rather divergent forms of the Renaissance. One is characterised by non-observance of architectural canons, and the other is noticeable for a particular adherence to proportion and lines. They are both French in their origin; but while one seeks to reproduce the extravagant and tawdry ornamentation of Louis XIV., the other aims at the purer forms of the Classical composition which has found its chief exponents under the Second Empire. It may be worth considering which gives us the best result: every architect knows which is the easiest.

ARCHITECTURAL OPTICS.

THERE is a kind of unwritten perspective about which few architects care to trouble themselves, yet a knowledge of the laws on the subject has been made a study by all men of culture. We allude to the optical effects produced upon all objects by distance, relative size, illumination, and the juxtaposition of lines and curves. The study appears to us to be the more useful in these days of imitation of forms used ages ago under very different conditions, especially so, when quaintness instead of refinement, grotesqueness instead of truthfulness, have become the aims of the artist, who thinks thereby he is conjuring back the life and spirit of the original. It is some years ago since Brewster read a paper on Optical Illusions, before the British Association, and Mr. Penrose, Mr. Cockerell, and Professor Donaldson, enlightened the public on the curves found in the Greek temples, yet many are still indifferent to the sources of visual deception. One man papers a room with a small-pattern paper of a light tint; another uses panelling of a dark colour, but people are seldom enabled to detect the real difference made by the two kinds of decoration. The difference indeed, is simply a matter of taste to the ordinary observer, and yet he may express surprise to find the former room so much larger in appearance than the other. The direction in which the pattern runs, whether vertically or horizontally, produces a startling effect in heightening or lowering the room; the relative size of the pattern and the colour of the paper produce also other appearances well known to the student of vision. Every schoolboy is acquainted with the effect of drawing lines diagonally, and others parallel across them; of drawing two sets of vertical and horizontal lines, and judging of their heights and width, and of various other combinations. The effect of light known as irradiation, may be curiously observed in patterns covered with black and white spaces. It is a controversial point whether an architect should correct the propositions of his buildings, or alter the lines of details to meet such illusive effects; the practical architect would perhaps think the matter hardly worth quibbling over, but it seems only reasonable that the designer should be prepared to carry into execution those effects he desires in the most efficient manner; he ought certainly to be able to work with precision, and eliminate all errors of sight.

As regards apparent size it is well known that St. Peter's at Rome disappoints the visitor for the first time, owing to the large scale of the details and sculpture. The colossal statues near the eye, and the figures of cherubs of the full size of men completely throw out every other part. The eye immediately takes these as a scale for measuring the interior, as Mr. Oldfield and others have shown to be the case. The large arches and entablatures of St. Peter's, in the design of which no allowance seems to have been made, aggravates the illusion, and until the stranger can adjust his eye by the actual figures of men and women, he cannot appreciate the magnificent grandeur of the interior. The same is observable in every large public building, where the size of small ornaments is increased or the main features are few and far apart, as the nave piers and arches of a church, the natural effect being to dwarf the building. A very common illustration of the effect of multiplicity and smallness of parts in increasing apparent magnitude and *vice versâ* may be furnished in the case of a room hung with a paper of a very small pattern, contrasted with the same-sized room hung with paper having a large bold pattern on it.

Again, the architects and sculptors of Egypt and Greece appear to have had a knowledge of the principles of perspective, for it is known that the heads of colossal statues are large compared with the other parts of the body the object being to preserve a due relation between the parts.

The value of the rectification of lines has been proved by all close observers of buildings. All straight lines and boundaries of objects have a tendency to look concave, and all architects know that straight-sided shafts and spires have an appearance of weakness, aggravated when any contrasting lines are near. It is not only observable, with regard to vertical lines, but is distinctly evident in all horizontal lines. The refinements of the Parthenon, ably described in Mr. Penrose's valuable work, on the Entasis and other curved lines of that structure (1846–1848) have shown that the Greek architects did not trust to straight lines, but refined upon them to make the visual effect as perfect as they could. The *entasis* or swelling of the columns, the convexity of the lines of the stylobate and entablature noticed first by Mr. John Pennethorne in this country; and the slope or inclination of the axis of the corner-columns of that temple, pointed out, we believe, for the first time by Professor Donaldson, are now facts that no one has attempted to dispute. Other modifications and corrections were made in the division of the columns and in the lesser details of the cornice; double rows of columns in porticoes were made to increase the effect of depth, by the use of smaller columns in the inner row, and similar expedients were adopted to intensify the effect of the laws of perspective by the medieval architects. Even in the minor detail of the flutes of the columns, it has been proved that the smaller ones had a greater number than the outer row, and that the flutes in the latter were often cut so as to give the appearance of greater depth of shadow, while those of the inner columns were segmental. Vitruvius, in book III, mentions other refinements, which the reader will appreciate, as for instance, the making of the angle-columns larger in diameter than those inside; a modification that has been proved in the Parthenon, the temple at Pæstum and others. In short, this refining and highly critical perception was carried throughout, from the outlines to the minutest detail. Everything was viewed from an æsthetic standpoint, and every care was taken to produce the desired appearance.

The bungling of modern detail affords a striking contrast to the work of the Greek artist. Architects are careless of the more delicate qualities of their details; after passing from them they are enlarged by clerks of works, or foremen who have not very scrupulous regard for nicety or effect; mouldings and proportions are grievously garbled or mutilated to meet the exigent imperious demand of the carpenter or mason, in many instances for the mere sake of reducing labour, or under the pretence of meeting some technical point. Bromley, in his "History of the Fine Arts" speaks of methods once resorted to by the ancients: he alludes to the omission of the upright parts of cornices employed at great heights, so as to render the cornice more proportionate when seen from below; the modern architect seldom bothers himself about corrections of this kind. Chambers, in his "Decorative Part of Civil Architecture," also speaks of the value of resorting to artifice in cases of this kind. It has been alleged that the Gothic architects did not practise this kind of effect, but there are many evidences to show that they were not ignorant of certain rules of perspective. In Early English jamb shafts we have, for instance, found the shafts to diminish as they recede, and the jambs of windows and doorways also splay inwards, producing increased depth. At Erbach there is a dormitory where the pillars gradually diminish in height. As seen from the end where they are the tallest, the perspective is artifically increased, and the room appears longer while at the other end the inequality is lost as the laws of perspective come into play. Instances occur, where a similar means of increasing distance is resorted to by making the walls approach each other at one end; but we are not about to apologize for all such deceptive effects, which are only tolerable in the construction of theatres. In arches, the use of stilting above the impost is not only allowable but desirable if they are to appear semicircular from below; and there are certain circumstances in which a knowledge of optical principles become of the greatest value to the architect, as when sharp curves of ceilings are seen close to straight lines, such as tie-rods, and curves spring from straight lines. A segment arched opening always looks wider at the springing, and a Tudor arch, with straight lines instead of curves, looks distorted at the upper part. We consider the study of the juxtaposition of lines and curves, and the perspective effects under which forms, &c., are seen, should be as necessary a part of the young architect's education, as the juxtaposition and harmonies of colours or the study of linear perspective itself.

THE SOCIETY OF BRITISH ARTISTS.

FOR the number of pictures and the accession of fresh talent the present winter display in the rooms of the Society of British Artists, in Suffolk-street, is not surpassed by former exhibitions. In the large room are to be noticed a dozen or more works, of considerable merit and power, though rather in respect of technical qualities or truthful rendering of nature than in imaginative design. Taking, for instance, "Roses," by Mr. W. H. Gadsby; in a boldly handled picture of two little girls making up bouquets of roses, there is more naturalism than ideality of sentiment; the faces are sweetly pleasing, and the reflected light on the countenance cleverly managed, although the colouring is a little garish. A number of landscapes of great beauty force themselves upon our attention. What can be more charming as a transcript of nature than Miss Kate Amphlett's "Spring," a pathway through birch-trees, painted with much vigour and impasto. The river Thames from Waterloo Bridge is a favourite subject for the painter; indeed, as a piece of scenery, it rivals in grandeur, if not in poetic interest, the view of the Doge's Palace, Venice; but we cannot say that in the hands of Mr. L. Clint Miles, it has been skilfully represented. The picture suffers from the thick muddy look of the water, and the weak foreground and other technical faults, contrasting somewhat glaringly with another picture of the same size, Mr. Walter Goldsmith's view of "Bray Reach near Maidenhead," a morning effect which displays all the haziness and greyish tone of a river-scene bathed in a soft morning light. Equally true to nature as an aërial landscape is Mr. A. G. Bell's fine picture (33) "The Aftermath." There is a touch of humour in S. Pepys Cockerell's "Marrow and Fatness" (16), and although a portrait, the facetious introduction of a large marrow in the wheelbarrow the chubby little fellow is drawing, takes it out of the commonplace; nor can we pass over Mr. S. Thor's "Still Life," chiefly noticeable for its colour. Near the corner of the room, a striking picture, called "A Duet," by Mr. F. Martin, attracts notice. The girls at the organ are thrown into shade by being placed against a large window through which the waning light of evening enters; a treatment which suggests a certain degree of poetic feeling, though the surroundings are not of the most poetic character.

Mr. Wyke Bayliss, as usual, contributes a few of his fascinating architectural interiors. The "Interior of Bruges Cathedral," from the choir (52), is a characteristic piece of drawing and colour; there is a semi-mystic spell thrown over the interior by the glamour of light and shadow, and the organ and screen are thrown out by contrast; it is obvious, however, that the painter has been more successful in his fine water-colour interior in another room, which we shall notice by-and-by. One or two pretty figure subjects, Nos. 22 and 23, are worth notice. Miss Flora Reid's work is particularly refined in colour and execution, and Mr. Stuart Lloyd gives us one of his fresh-looking marine views in Dunnose Head, Isle of Wight. Mr. J. Gow, this year, contributes two subjects: his "Morning Greetings" (55) is clever in composition, but the arm of girl is in questionable drawing. Mr. W. H. Bartlett's "Evicted Tenant" (65) will be scanned with interest, and Mr. E. Aubrey Hunt's fine landscape "A Summer Afternoon in Surrey," cannot but receive praise for breadth of colouring and simplicity of subject, and for the fine painting of the field and pathway, the dark blue trees, and distance. Over the fireplace, a lovely grouping of "Lilies and Roses" is hung, painted by W. J. Muckley, a master in flower composition; and perhaps, as a picture of the *genre* class, Mr. Hayne King's "Private and Confidential" (92) is, for tone and finished execution, unsurpassed. The scene is a cottage kitchen in which are seated two girls, one of them reading a letter. Mr. David Law, as usual, is the contributor of a few forcible drawings in water-colour. His "Breezy Morning on the Scar" is a fresh-looking study; and in landscapes we must not pass by Mr. E. Ellis's fine picture, "The Haunt of the Wild Fowl" (109), a forcibly-painted piece. A rather amusing incident is told in Mr. W. Dendy Sadler's "Great Expectations": an enthusiastic angler, under an umbrella, by the side of a stream, in the rain, patiently waiting a bite, while by his side stands a tall, thin, careworn man, holding the tackle. This year, Mr. A. J. Woolmer is represented by only two subjects. "A Thought, from Tennyson's 'Sea Fairies'" (128) is poetic and weird in sentiment. It represents a bay, with a rocky cave, peopled by nymphs, the green sea and the colouring are remarkable for the pearly hues and stagey effect which Mr. Woolmer delights to impart. A few of the most striking pictures are to be found on the opposite wall. Mr. H. Caffieri, whose work stands high, sends a large picture, entitled "A Marauding Family" (191), a beech-wood of bright green, the marauders consisting of a man and a few children gathering wood. Mr. Godfrey C. Hindley's "No Admittance Except on Business," though small, will enlist attention for its comicality no less than for its quiet satire. An insignificant little dog is begging on its hind legs before a bombastic guard in cavalier costume for admission into an inner chamber. The artist has amusingly depicted the expression of overbearing in the old guardsman, and the tapestry and accessories are truthfully painted. "A Quiet Nook," by R. J. Gordon, a young member, is a large canvas. A fair-haired damsel, in white cap, seated under the shade of green trees, reading. A gleam of sunshine falls on the face and book; the figure is graceful, and the colouring bright, and the artist has been contented with conveying the quietude and, in a certain sense, the sentiment of the theme. Mr. James E. Grace's "Thistledown" is a clever broadly-handled landscape; but perhaps one of the most powerfully painted subjects is Mr. J. White's picture of "The Farmer's Boy," executed with an impasto touch, and displaying much dexterity in the broad simple management of the figures of horse and boy, and the old barn, which make up the group, and the illumined evening sky in the background, which thows up the figures in bold relief. The muddy road and the white cob, and the reflected light of the bright evening sky are inimitably executed. We must also call attention to Mr. Macnab's "Resting Place," a quiet study of country life, and the eminently artificial subject of Mr. W. Holyoake, "Divining the Future," in which three young ladies in evening dress are seated on an ottoman in a gaily-furnished room playing cards. We cannot but think the costume and upholstery overbearing and garish in colour. Fresh and spirited is Mr. E. Ellis's "Among the Sandhills" (227), while at the corner of room we mark a circular canvas, "Otter Hounds," by Mr. J. Emms (246), a group of vigorous composition but lacking repose. Perhaps one of the most satisfactory pictures is Mr. C. T. Garland's highly executed and finished picture, "A Contented Mind is a Continual Feast." A dark-complexioned bright-eyed little boy, dressed as a Spanish noble's son in a yellow satin tunic or knickerbocker suit, with blue sash and ribbon bows to his shoes, is seated in a handsomely carved chair, holding a plate of fruit in his lap, apparently in the very best of moods, and careless of the luxurious surroundings in which he is placed. We may also call attention to Miss Bowkett's clever aërial picture, "On the Way to the Downs" (180); E. J. Cobbett's "Flower Girl," rather garish in colour; Mr. Vincent P. Yglesias's "View of the Medway at Rochester" (177); Mr. Ernest A. Waterlow's "Early Morning" view in the Thames Valley (175), Mr. F. Slocombe's "Day Dreams," Mr. J. R. Reid's "Lost and Found" (144), "Moon Rising: Portsmouth Harbour," by Mr. G. S. Walters; Mr. A. Conquest's "In the Bois d'Amour" (137), Mr. R. Dowling's "Shylock and Jessica," harsh and discordant in colour; Mr. H. C. Fox's softly painted view of the Thames (151), and especially Mr. Arthur Hill's study, "The Fibula," a classic conception, representing a maiden at the bath adjusting or buckling her chiton or tunica, a half-nude figure standing upon a marble floor, and having a marble dado behind her. The colouring is quiet in tone and luminous, and the drapery well drawn, but the figure wanting in feminine grace. In the south-east room a few cleverly-painted subjects are hung. We note, among the best of them, Mr. Arthur G. Bell's "Idle Hours," bold in composition, and Rembrandt-like in depth of tone and shadow. Mr. Ellis's masterly and spirited study of a "Wintry Gleam, North Wales"; A. Ludovici's "Fresh-Water Sailors," a brilliant composition of summer foliage and gaily-dressed ladies in a pleasure-boat, thoroughly French in spirit, and some excellent grouping and vigorous handling in Mr. J. H. S. Mann's study, "Watching the Lifeboat from Yarmouth Jetty." As a touching episode, Mr. A. Davis Cooper's piece, "The Day After the Fair" (296), must be pronounced a decided success. The little dancer, in her dancing dress, resting on her drum; the weary-looking dog and donkey, and the pitched tent, are true to life, yet stirring enough to place it in a higher class than merely imitative art. "The Matadore's Bride," by W. Holyoake, charms by the expression; and Mr. Leopold Rivers's picture, "On the Common," by the depth of colour and the breadth of landscape. Mr. Fraser sends one of his luminous marine views, "Running Down on the Ebb" (331), delightful in its cool and refreshing greyness and transparency, and Mr. Lionel P. Smyth in his "Short-Handed" (351), has, in a small canvas, depicted with dramatic power a thrilling deck scene, a small hard-worked crew engaged working the pumps in the midst of an angry storm. It would be impossible not to pay a tribute to Mr. A. M. Rossi's picture, No. 371, a brilliant bit of colour; Mr. B. G. Head's piece, No. 375; the rich "Interior of Tewkesbury Abbey," No. 380, a finely rendered interior of Perpendicular work, by Mr. Wyke Bayliss; Mr. E. W. Waite's broadly-painted "Village Bridge"; Mr. W. H. Gadsby's "Forty Winks"; the quiet river scene by Miss Bowkett; and "Hide and Seek" (396), by E. J. Cobbett. In the south-west room, also, Mr. J. Rick's "Loitering on the Stairs" is a prettily coloured subject, and near it Beatrice Meyer in her "Veil of St. Veronica" gives us the legend of the Saint whose veil was impressed with our Savour's features on his way to Calvary. The old woman brushing the hat at the foot of stairs, in Mr. J. Hallyar's "Sunday-go-to-Meeting Togs," is a true rendering of Sabbatarian decorum in the country. Sickly and feeble is the conception in A. Ludovici's "Elaine," while M. A. Rossi's smiling Spanish face in No. 434, will attract by its winsomeness. We can only note the subdued colour in Carl Bauerlé's "Spring Time." The bibulous-looking monastic "Brother Ambrose," by W. Dendy Sadler; J. E. Grace's "Autumn Leaves"; Mr. Ellis's sparkling bit of sea, in No. 503; Mr. Edgar Hanley's decorative study of a picture against a gilt leather background; the "Cavalier Taking Wine," by Hamlet Bannermann; the Cromwellian study in Mr. G. C. Hindley's "Anonymous Letter," and Nos, 534, 466, and 534.

The water-colours comprise some excellent work. Landscape is a favourite subject with many. Mr. Arthur Burchett has produced with touching fidelity in his large drawing of "The Dying Flame of Day," the reflection of a sunset on a quietly-running stream with banks of foliage and a vigorous foreground; Mr. C. J. Watson, in a different key and tone, has given a fresh little bit of common and river in No. 552; Mr. Bernard Evans sketches with his usual power several fine views: "A Path through the Woods" (556); a bold "Valley Farm, Arthog, near Barmouth," striking for the rounded masses of trees in the fore and middle ground, and the mountains behind, an especially brilliant picture. Mr. T. Pyne has contributed a fine piece of river scenery in his picture of "The Arun" (570). broad and soft in handling; and Mr. Bernard Evans introduces us to another study of atmosphere and mountain background in "The Estuary of the Mawdoels" (613.

We may also draw attention to a few architectural subjects, foremost of which is Mr. Wyke Bayliss's "Interior of Westminster Abbey" (933), a grandly-drawn interior taken from the chancel, in which the artist's manipulative power is shown at its best. Mr. Bayliss has a peculiar style of his own combining the force and depth of oil in his shadows, and the iridescent lights he throws into his work. In the arcade this mottled effect is striking, and the shadows are worked up to considerable depth. We cannot say much for Emma M. Jennings's "Study of Italian Architecture"; the drawing is rather feeble; and Mr. H. Harper's "Acropolis, Athens," is rather chromo-like. Certainly, the view of the "Parthenon, by Sunset," by Mr. R. Phené Spiers, leaves little to desire in drawing or colour; the burnt-sienna tones are exceedingly rich. Mr. C. St. John Mildmay sends also a clever study of Venetian architecture in his "Ponte San Toma (739); nor must we pass L. Fennel's drawing of "Municipal Palace, Cutigliano," transparent and trustworthy in drawing. We have space only to mention another Renaissance example in Margaret Ravenhill's "Courtyard of the Castle, Stuttgardt"; the charming colour study, "Fresh Gathered," by Carlton A. Smith; Mr. Francis H. Eastwood's pleasing poetical sketch "Princess Dreamy Eyes," the apple-blossom in Mr. A. Wardle's "Spring," Mr. Carlton Smith's "Events of the Week," Mr. Bannatyne's sketch of "Rye, Sussex," the vigorous sketch of Ambersham Common by Mr. S. Palmer; Mr. Stuart Lloyd's "Over the Cliffs," a finely rendered bit of foreground; "Poppies," Mr. David Law's "Moorland Cottages," and his spirited sketch "On the Yorkshire Coast"; Mr. B. W. Spiers' highly finished "Old books and bric-a-brac," the charming study of contrast of apple-blossoms in bright green vase by Kate Sadler, the admirable, truthful landscape by Mr. J. Finnie "The Edge of the Common," and W. H. Pike's view of "Kynance Cove, Cornwall," and the delicious bit of colour in Miss Ada Bell's study of rich chrysanthemums in vase (731). "Christmas Carol" is a clever group in black and white, nor can we omit the artistic drawing "A Visitor from the Garden," where the open window, the intruding bird, the tapestry and curtains, and the figure of the little girl make up a pleasing study of accessories and harmony, and reflect credit on the artist, Mr. C. W. Dempsey.

ARCHITECTURAL ASSOCIATION.

MR. GILBERT REDGRAVE ON THE USES OF CEMENTS.

(*Continued from page* 613.)

A THIRD reason for employing cement in preference to limes, is that a method has been discovered by General Scott, whereby limes can be converted into cements by a very simple process, and at a very moderate cost. About five-and-twenty years ago, General (then Captain) Scott, of the Royal Engineers, found that a sample of grey lime, burnt in a common fireplace with a smothered fire, had acquired properties very different from those of the same lime if prepared in a clear, bright fire. He at first thought this peculiar result was due to the formation of a sub-carbonate of lime, owing to the imperfect combustion of the fuel; but subsequent experiments caused him to abandon this view, and to adopt the theory—ultimately proved to be correct—that the change in the character of the lime was due to the presence of sulphur, which had been absorbed from the ashes of the coal. This led to the invention of "Scott's cement," which was prepared as follows: Tender-burned grey chalk lime, made from a lower chalk containing from 10 to 15 per cent. of silica and alumina, was reheated to bright redness in shallow kilns or ovens, having a perforated floor. When the lime was sufficiently hot, pots of sulphur were placed beneath the floor. This sulphur was at once ignited by the heat of the kiln, and the fumes of the burning sulphur then rose round the lime, and a coating of sulphate of lime was formed over each of the lumps. The lime was then ground between millstones, and Scott's cement, ready for use, was obtained. As this cement appeared to owe its peculiar properties to very minute quantities of sulphate of lime intimately mixed with it, General Scott thought such a cement could be produced in a cheaper way. Sprinkling lump lime with sulphuric acid, and mixing ground lime with plaster of Paris, were tried, but it was found impossible to secure uniformity by any other than the gaseous method above described. Many years after, during the building of the Exhibition of 1871, General Scott found that if the selenitic lime, however prepared, were first ground in a mortar-mill to a creamy paste, and the sand was then added, a very good cement action was secured; and he made a selenitic cement, as he has termed it, from a careful mixture of ground hydraulic lime and sulphate of lime. This cement will bind together six parts of sand into an extremely hard mortar, and will make a good concrete with nine parts of ballast. In using all cements, in order to secure their utmost strength, clean sand is eminently necessary. Sharp, large-grained sand makes better work than fine sand; and there seems scarcely any objection to clean sea sand, except that for internal plastering it is liable to become damp at changes in the weather, as the salt absorbs moisture. Salt sand makes stronger cement than pit or river sand; provided all are equally clean. In conclusion a few words must be said about the use of cement in concrete. In this direction very little has been accomplished hitherto, and we plod on in London with bad bricks and bad mortar, as if there were no escape from a thoroughly vicious system of building which ought to have been abandoned with the erection of the Tower of Babel. As London, from its peculiar position is, and must continue, a brick city, we ought, with our present knowledge of the properties of cements, to make our bricks much smaller so as to serve as mere aggregates; or what would be better still, we should calcine our brick earth in heaps as ballast is made, and unite this burnt clay into monolithic structures with Portland cement. There is no legitimate argument in favour of selling underburned, mis-shapen, discoloured lumps of calcined clay at so much per 1,000, in order to enable builders to charge us £14 and upwards per rod for sticking them together into walls. It would be far better to burn the bricks into clinkers, and then incorporate the fragments of them into homogeneous structures, with good cement, at less than two-thirds the cost of brickwork. I hope to see the day when bricks will be discarded, and I trust that the New Zealanders, when they explore the ruins of London, may find it necessary to dig very deep down into the *debris* before they find any "genuine, sound, square, hard-burned stock-bricks" for the ceramic museums of the future. The days are past when the colour of cements must ever be thrown in our teeth as a reproach. Mr. Lascelles has shown the possibility of so colouring Portland as to render it scarcely distinguishable from red brick or terra-cotta, and the house he sent to the Paris Exhibition formed a new departure in concrete building. Mr. Lascelles is able to prepare mouldings and dressings in this material at a less cost than the same work in cut bricks or terra-cotta. In point of natural colour selenitic cement, which is a warm buff, leaves little to be desired. Another direction in which cement-concrete might be used with advantage is evidenced by the manufactures of Messrs. Henry Sharpe, Jones, and Co., of Bournemouth. This firm has succeeded in making excellent drain-pipes of Portland cement concrete. Cement of high quality is by them mixed with crushed pottery, in the proportions of 1 of cement to about 3 of pottery. The cement is made in small quantities in a special mixing-machine, the materials being first turned over dry, then sprinkled with water from a fine rose, and made into a very dry concrete. The mixture is next lifted into a hopper, which feeds it automatically, and very gradually, into the moulds. These are made as cylinders of sheet-iron, the proper distance apart to form the thickness of the pipe, from 1in. to 3in., according to its diameter. This mould rotates slowly on a turn-table, while an iron rammer, worked up and down like a beetle, compresses the concrete into the mould as it falls from the hopper, When the pipe is full, it is wheeled away on a truck, mould and all, and stands for from 24 to 48 hours to set. When taken from the mould, the newly-made pipe is steeped for a week in a bath of silica—to indurate it more effectually—an ingenious process invented by Mr. Highton, and also used by the Patent Victoria Stone Company. The pipe may remain in the bath for about a week, when it is removed and shelved in the open air for some months before being sent out for use. The Victoria Stone Company just mentioned make excellent paving slabs of granite chips and Portland cement. The slabs appear very durable, and are not so costly as common York paving. Mr. Drake has recently shown me some interesting specimens of the marble and granite mosaics his company are now producing. I feel that this paper is very disjointed, but I trust I have succeeded in convincing you that the "use of cements" is a subject well worthy the careful attention of every architect.

The President, in inviting discussion upon the paper, remarked that he was not such an ardent believer in the homogeneous house of the future as was Mr. Redgrave.

Mr. W. H. Lascelles described a number of examples of his concrete work which were exhibited in the room. Some slabs of this material had been used by a Queen Anne architect in a new system of construction, wherein the behind joists and flooring above were all represented by a thin iron rib upon which were laid plates or slabs of concrete, which would be laid with carpet or kamptulion in the ordinary manner. A well-known ecclesiastical architect was about to build a house for himself upon this principle. A great deal of room was saved by it, and no space was afforded between floors for the accumulation of dust or gas, or the passage of mice. He had found that the tenants of cottages built in this manner experienced no annoyance from the transmission of sounds. At the present time he was engaged in experiments to see if he could produce cheaper artisans' dwellings than had yet been built, and he believed this to be possible, as the great item of expense was the cost of floors and partitions for sub-divisions. He referred to the concrete house, and the concrete bath he exhibited last year at Croydon, and to the tests which they successfully withstood, a room being filled with faggots, afterwards set on fire without injury, and the bath bearing sudden filling, first with hot water and immediately afterwards with cold, and no leak or crack resulting. Owing to the non-conducting quality of concrete, the bath retained its heat better than one of any other material. When made of comparatively soft material, cement concrete will hold a nail almost as firmly as wood. Mr. Lascelles also showed photographs of the concrete dome recently made for transmission to India, and described in the Building News (p. 408, *ante*.) Cement work had superseded cut brickwork, as it was cheaper, stronger, and more impervious to wet. He had laid a slab of this material in Moorgate-street, E.C., eight months since, and at present it had not worn away more than a sixpence thickness.

Mr. C. Drake referred to a paper read, and discussion thereon, in the same room in Dec. 1867, and said the retrospect would teach that the use of cement decoratively had not obtained the approval of architects, and it had failed to satisfy chiefly in respect of colour. With a view to remedy this defect, the speaker had made experiments in 1867 and now exhibited red cement concrete tiles made in that year and in 1868. Some of these had been laid as flooring in 1870, and were now perfect in colour and soundness after ten years' wear. He had also used red coloured cement successfully as dressings and mouldings, but found that using the ordinary red colouring matters of commerce made it necessary to use so large a proportion of colouring matter (sometimes so much as fifty per cent.) with the cement as to cause unsound and unreliable work. He had, however, recently discovered a red capable of giving an intense red colour when used only in the proportion of one-thirtieth part. A sample of "mosaic marble" was exhibited—the black marble aggregate of which is less hard than the red cement matrix—showing that the crystallisation and induration of the cement had not suffered from the admixture of colouring matter as it is apt to do when common red colours requiring to be in large proportions are used. Mr. Drake also exhibited a fireproof door being made in "mosaic stone" (for the Theatre Royal, Manchester) "mosaic stone" concrete moulded corbels, buff and red without colouring matter; "mosaic granite" and "mosaic marble" slabs and tiles for floors, walls, &c., and claimed that by this new method of showing on the surface the actual material of which the concrete was compounded the most beautiful effects in colour are obtained, and the problems of the use of cement decoratively and of architectural treatment of concrete building are solved.

Mr. J. S. Quilter said he had had a great deal of experience in ordinary Portland cement concrete, the use of which was very largely increasing in Streatham and similar suburbs of London, built on a clayey subsoil which could be employed as burnt ballast with the Portland cement concrete. He was rather surprised that Mr. Redgrave should have recommended the use of loam. In his own experience, it had been slow in setting, and it never seemed thoroughly set, and was never quite reliable. The best damp-proof and satisfactory wall was one with a brick face and concrete back. He would propose a vote of thanks to Mr. Redgrave for his instructive paper.

The vote of thanks having been accorded with applause, Mr. Redgrave said that, as to the use of loam, it was put in to destroy the effects of shortness in the fat limes. It was a very dangerous material, as damp got into it. Every departure from purity and cleanliness in cements was to be deprecated.

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SANITARY SCIENCE IN ITS RELATION TO CIVIL ARCHITECTURE.

At the third ordinary meeting of the Royal Institute of British Architects, held on Monday evening, Mr. J. Whichcord, President, in the chair, Mr. E. C. Robins, F.S.A., read a paper of considerable length on this subject. He said he thought those architects who for the last thirty years had practically proved their interest in sanitary science in so far as it related to architecture could not be otherwise than be pleased with the obvious improvement in recent public opinion and the quickening of the professional conscience thereon. Having referred to the works of pioneers in sanitary science, to the disgraceful condition of London before the Great Fire, to the suggestions of Patte for improving the state of Paris in 1797, and to the great impetus given to the consideration of sanitary questions in England by the visitations of Cholera in 1842, 1847, and 1852, in which latter year his own attention was directed to the matter, he said he proposed that evening to consider: (1) What had been defects in sanitary construction, (2) What were the remedies now generally available, (3) What further improvements were required. In London a system prevailed which compelled the professional architect to provide against the insanitary condition of the main sewers: he had to fortify the modern dwelling-house against sewer gas, which contaminated not only the air breathed by the inmates but also the water they drank. It was not necessary to enter into much detail respecting sanitary defects. A summary was provided in a pamphlet entitled "Dangers to Health," written in a grimly-humorous way by Mr. Teale, surgeon to the Leeds Infirmary, and dedicated to his medical brethren. Such defects consisted not only in those things for which an architect might be blamed, but also in the faulty workmanship of artisans: in the jointing of bad iron and stoneware piping, in false levels and bad laying of drains, in perverse connections on the wrong side of traps, in ill-supported vertical soil-pipes, in the thousand evils emanating from the want of trained foremen and workmen. At the Conference on Public Health held in June last by the Society of Arts, Mr. Rawlinson had stated that house drainage was at the root of all sanitary reform, and that Earl Spencer's town house in St. James's-place was the most perfectly drained house in London or elsewhere. The evidence given by Messrs. Eassie, Rogers Field, and Griffith and other specialists before the Society of Arts was referred to. The principles summarised by Mr. Griffith were quoted—principles which the author said were quite in harmony with many architects' previous practice. They were (1) Communication between main sewer in street and house-drain should be disconnected or severed by an open-air space being left between house-drain and sewer; (2) The house-drain, air and water-tight, should be laid to such a fall as to be self-cleansing, free from deposit, and ventilated; (3) The soil-pipe should be fixed inside the house and taken up full size above the roof; (4) The waste-pipes should discharge into the open air instead of into soil-pipes or a D trap; (5) There should be no means of drawing water from a cistern supplying a w.c., other than through the closet; (6) The waste-pipes from sinks, baths, lavatories, &c., should be S trapped underneath, and made to discharge immediately into the open air, over trapped gullies; (7) There should be no connection with the main house-drain, when laid underneath the house, except outside the main walls of the building; (8) "Pan closets" with D traps should never be used, nor should D traps be fixed under sinks, &c. The evidence of Messrs. Eassie and Rogers Field coincided in all material points with that of Mr. Griffith. The author prefaced the subject of warming and ventilation, the second division of his paper, by quoting a remark made to him by Professor Jenkin, to the effect that the study and control of the pressure of the atmosphere, and not the temperature, is the key to all sound ventilation. As that pressure was increased or diminished in its utilisation so ventilation was promoted or retarded. Following the suggestion of Dr. Parkes, it was desirable to restrict the thing known as ventilation "to the removal by a stream of pure air of the pulmonary and cutaneous exhalations of men, and of the products of the combustion of lights in ordinary dwellings, to which must be added in hospitals the additional effluvia which proceed from the persons and discharges of the sick." It was not only important that the air should be changed, but also that it should be drawn from a pure source and carried through clean channels. By the term "ventilation" the author meant a passage for the wind, change of air or atmospheric recuperation. A way in was wanted for the air and a way out for it in every building or portion of a building. Natural ventilation was the simple process of allowing the external atmosphere to mingle with the internal atmosphere of a building. Scientific ventilation was the same thing, but with this difference: in the former case the air was free to mingle or not as it pleased, and in doing so it created many inconveniences; in the latter, direction was given to currents of air produced by interchange, and a healthy commingling of the oxygen with the carbonic acid gases was secured without the dangerous and disagreeable accompaniment of draught. The business of ventilation was to direct the pressure of the currents of air admitted and required to overcome stagnation under conditions where no draught was admissible. The natural process by which the temperature of the air was raised was two-fold: by radiation and by conduction. Radiated heat he defined as possessing the peculiarity of passing directly through any intervening space, without parting sensibly with its heat, and warming the first obstacle to its passage, such as a wall or window, with which it came in contact; conducted heat was the warmth given off from any surface by direct contact with any substance whether air or otherwise. The conducted heat of an open fire passed into the air, escaping by the chimney flue, and was lost for heating purposes; the radiated heat of the open fire was alone available for raising the temperature of a room. Draught, however, was almost inseparable from the use of open fires, especially when they were placed directly opposite doors, whereby large quantities of air were drawn across the floor and passed up the chimney. With reference to the size and position of "inlets" in rooms, it was desirable to make the area of each opening not larger than from 50 to 60 square inches, and they should be placed on the same side of the room as the fire-place. The introduction of air by vertical shafts, suggested by a Mr. Whitehurst years before Mr. Tobin was heard or even thought of, was a sound principle, suited to the requirements of ordinary rooms which were heated by the open fire-place only. Mr. Robins then drew attention to several varieties of stove and grate, including those invented by Mr. Phipson, by Messrs. Verity, and other architects, and, amongst others, described the heating and ventilating processes adopted by the late Mr. T. H. Wyatt in the new Hospital for Consumption at Brompton, and also in the Norfolk Hospital at Norwich, built by the same architect in conjunction with Mr. E. Boardman, of that city. Dr. R. E. Thompson had, in a letter to Mr. Robins, thus summarised his views:—"I think that air should be admitted at the level of the various floors, and not from an underground chamber; also that the air so admitted should come from the east and west sides if practicable, and in any case should be passed over tubes of hot water. Air of uniform temperature is disagreeable and oppressive; it is better that the upper air should be colder than that of the floor, and that the warm air as it rises from the floor-level should be cooled and agitated as it mixes with the upper air by the incoming cooler air. The foul air should be extracted by the open fire, and by the extracting flues at the top of the room, which should be heated by gas jets below, or made to communicate with a hot-air chamber above and in connection with turrets forming ventilating towers." With regard to w.c.'s, Dr. Thompson considered that the space they occupied should be heated to a higher temperature than the passages leading to them, and that a separate means of extraction should be adopted. In reference to systems of underground reservoirs or chambers for the accumulation of heated air to be transmitted through shafts to the different rooms of a building, everything depended on the cleanliness of those heated air-chambers. They were very difficult to keep clean, because they were out of sight, and were usually dirty and dusty; indeed he had heard of some air-chambers in which decayed organic and vegetable matter had been allowed to accumulate; and of an instance in which a defective soil-pipe had discharged into it part of its contents. Alluding to the various systems of heating, the author said that he had no great faith in any one of these, but that where he had to go beyond an open fire, in apartments too large for warming in that manner, he preferred hot water. Twice in his practice he had been obliged to substitute hot water for hot air, both instances being in churches. Two leading principles governed the supply of hot water for heating purposes, termed high pressure and low pressure. The latter provided for the supply of water at a low temperature, which cannot reach boiling point, in more or less large pipes; the former circulated water at a high temperature in strong wrought-iron pipes of very small bore, rarely exceeding an inch in diameter. The high pressure system as now carried out was as innocuous and quite as effective and manageable as the low pressure. After referring to various examples in his own practice, of which numerous illustrations in sections and working drawings were exhibited, Mr. Robins concluded with the assurance that the practice of Civil Architecture could not be divorced from the experiences of Sanitary Science. There was plenty of room for specialists and *dilettante* exponents—indeed co-operation in overcoming the results of past carelessness was most needful; but the fact remained that dwelling-houses, to be made healthy in the future, were and would still be the special province of professional architects.

Dr. W. H. Corfield, at the invitation of the President, opened the discussion. A great deal had been said of late, he remarked, about the failure of architects to avail themselves of the advances of sanitary science; it was declared that they did not know their business; and all the failures in drainage and defects in ventilation of houses were laid to their door. For his own part, he had not found this to be the case. He had often met architects in consultation, and had always found them gentlemen who were able to understand all points that were raised, and he was glad to be able thus to acknowledge the courtesy with which he had always been met by members of the profession. Mr. Robins had told them that architectural practice could not be divorced from the experiences of sanitary science. He would go rather further, and say if it had not been for the experiments that had been made by scientific men, no alteration in sanitary principles would have been carried out. For many years people had dealt with house-drainage on a wrong system—that of bottling up foul air—and the erroneous method would probably have continued till now if it had not been for certain remarkable experiments, by which the real danger of sewer air—"gas" it was even now improperly called—was made apparent. It had been shown that enteric fever, and more recently that other diseases, were produced by a specific poison existing in sewer air, and communicable by contagion. Next it was ascertained that the poison was not the sewer air itself, but particles in that air, and it was now almost demonstrable that these particles were living germs, and the result was that people could now understand how they might prevent these particles from obtaining an entrance into their houses. But the practice of sanitary science had not been carried out, as the author said, "for a considerable number of years"—certainly not for more than ten years—he might almost say six or seven. Disconnection of sewer and house-drains had been shown to be essential by two sets of experiments; one proving that the dangerous particles could pass by absorption through water, so that a trap was no bar to the movement of foul air through a drain; the other, that when foul air was disturbed, as Dr. Franklyn had shown, it would pass through a water-trap, and would be dispersed in the air above, contaminating it. Thus, while a water-trap would partially prevent the passage of particles, it could not prevent the passage of foul gas. But it was now possible to make a house perfectly secure against the entrance of typhoid fever, and should the fever be imported by any person, it need not spread. Acting upon this knowledge, he had been able to state that a well-drained school in which typhoid occurred need not be closed, as if precautions were taken, the contagion could not spread. Although the principles of sanitary science were now perfectly clear and simple, yet to put them into practice was most difficult, especially in the case of an old London house, where it sometimes seemed impossible to put it into an efficient and healthy condition without pulling down the entire structure. To tell people to get a book on the subject and read it and put their dwellings in order, was as absurd as to tell a man to read a book on amputation, and then experiment by cutting off a friend's leg. One of the most amusing things was to go into a house where a man had tried to cure its defects himself. Often in houses which had been put in order by professional men, sore throat, sewer-diarrhœa, and similar diseases were noticed. These showed that it was insufficient to disconnect the sewer and house-drain, but that the waste-pipes of sinks, discharged even into an open chamber, needed trapping. Air passed, during the night, through the air-chamber into the house, and gave rise to the sewer-diseases in question, so that a water trap was necessary here. The waste-pipes of sinks were not proper ways for air to come into a house.

Mr. E. R. Robson, F.S.A., regretted that the author had not mentioned methods for keeping a house dry, for that was a first step in sanitary science. Further, the worst and most frequent cause of disease had not been alluded to, namely, that the same cistern that supplied the closets also furnished the drinking-water to the household. Mr. Robins had said that "drains should be air and water-tight," but this appeared to him wrong; the modern practice was to admit of a full circulation of air. [Mr. Robins: I meant that "all the joints of drains should be impervious."] He was glad to hear the satisfactory explanation of what had sounded like a retrograde step. The last point raised by Professor Corfield, that the waste-pipes of sinks needed to be trapped even when discharged into the open air was novel, and he had made a note of it for practice. Ventilation opened up a wide subject, but all architects had to do was to follow natural laws in the main. An open fire seemed a charming mode of warming a room, but it was exactly the wrong mode. It warmed the walls which were already heated, and left unaltered the parts near the windows, where it was most wanted. In any system of warming, an effort should be made to introduce heat under the windows, and, above all, to render the corridors and passages of the house comfortable. With regard to the use of steam for warming, the provisions of the Metropolitan Building Act were obsolete. It persisted in treating hot-water systems as low pressure, and steam as high pressure, whereas steam could now be used as low pressure, and the special safeguards required by the Act were unnecessary. Vertical ventilation, it was perfectly true, was earlier than Tobin, but he should use larger pipes than the author had recommended—up to 144 square inches across pipe; they should be placed as far as possible from the fire, and horizontal pipes should be avoided to the utmost extent. Unless absolute exhaust power were obtainable, the inlet openings should be made larger than the outlets. He entirely objected to the dirty air-chambers; they never were kept clean, and whenever they had been introduced into schools, the inmates complained after a time of lassitude, fatigue, and weariness. The heated air, so introduced, had been stated to be chemically pure, but the facts remained. Unless the heating was by direct radiation, a system of warming was wrong in principle. He wished to recommend five or six books on these subjects which were worth reading. First he placed Hood on "Warming and Ventilation"; then the late Dr. E. A. Parkes "Hygiene," Buck's "Hygiene," Professor Leeds' "Treatise on Ventilation," an American work; Captain Douglas Galton's "Healthy Houses," and Hellyer on "Heating." He complained of the mutilated abstract of the paper now issued by the council, and suggested that communications should be published complete, as in previous sessions.

Captain Douglas Galton, C.B., F.R.S., said he wished to add to the list of books recommended by the last speaker, that by Box, on "Heat." The author of the paper had not alluded to a cause of disease, at least as serious as sewer gas, namely the entrance of ground-air. Too many houses in London were built upon very impure sites. Builders had excavated the sand and gravel and had allowed the sites to be filled in with rubbish upon which houses were built, which became beds of fever for years afterwards, as the ground-air was drawn into the house through the walls and basement-floors by every fire. Architects could not devote too much attention to this matter of foundations. He had recently been to America and availed himself of the opportunities to see what was being done there, and he thought American architects seemed to have a greater scope afforded to them than was the case in this country; greater freedom was given them, and money was not so much stinted. In New York he remarked a church and a theatre in which the arrangements for ventilation far surpassed anything he had seen in England. The church he alluded to was a Presbyterian one, in which Dr. Hall presided, and was closely seated for 2,000 persons. The ventilation, however, was excellent, and was partly upon the propulsion, partly upon the extracting principle. The theatre was that in Maddison-avenue, and here, again, the ventilation and warming were far more perfect than anything done here. He was much struck with the perfection to which Americans had carried their systems of heating by steam. Steam had great advantages in the high temperatures obtainable; but there were also inconveniences. One recommendation of the hot water was that you could easily regulate the temperature, and although there was a method of employing steam beneath exhaust power, it was neither very usual nor very successful. Another disadvantage of steam pipes was the noise of the steam in them. Indeed, for a climate like that of England, where the variations of temperature were not great, hot water was the most economical system of heating. As to emanations from sinks, it was recently found that a series of pipes at University College Hospital, Gower-street, which only removed the clean waste-water from tanks provided against fire, were so offensive that they had to be removed—but then the water was that of a London water company. (Laughter.) Mr. Robins's paper was one covering such an enormous extent that it was quite impossible even to allude to it thoroughly off-hand, and he would suggest the adjournment of the discussion—first, however, proposing a vote of thanks to Mr. Robins for having brought the subject before them in so comprehensive a form.

Mr. Ewan Christian could confirm the last speaker as to Dr. Hall's church in New York; he had never entered a place of worship where the ventilation was so perfect. At Detroit city he saw that from one set of pipes all the buildings, both dwellings and public edifices, within the radius of a mile, were heated to 62° Fahr. from one set of boilers, and this when the temperature fell to 20° below zero, and the surplus steam worked all the lifts in the district. Such a system of heating was not necessary in this comparatively mild climate. As to soil-pipe ventilation, he believed Mr. Norman Shaw, in his soil-pipe disconnection, had solved the difficulty of house-drainage; he had tried it in a house in Gloucestershire, and had found no occasion for traps. What Dr. Corfield said of the dangers from influx of air through sinks was, he confessed, perfectly new to him; he had not found any foul air enter where the drains were kept outside a house. No architect ought, he thought, to have any difficulty in keeping all drains external. The passage of air through walls had been referred to; he always built them hollow, and thereby gained not only greater strength from properly-bonded hollow walls than would be found in the same quantity of material laid solidly, but he had a non-conducting layer of air, a blanket, in fact, which made the house warm in winter and cool in summer. He had built a cottage with an exterior of 6in. instead of the usual 4in. timber quartering, inside walls of boarding and tiling, and between these, separated by air-spaces, fillets and rough plastering; the cottage had been found most comfortable by its tenants. In the early days of the Gothic revival, he advocated the formation of air-spaces in roofs which were then miserably thin, and he had continued to adopt that plan up to the present day. But care must be taken in building with hollow walls to exclude bad smells or they would travel through the cavities. He had an instance of this at Addington Palace, where the Archbishop of Canterbury called him in to ascertain the cause of offensive smells, noticed only in the upper parts of the house. He found that the drains were all laid under the house, and that the foul air was drawn behind the battening to every room where a fire was lighted, and so impregnated were the walls with the smell, that after the battening and plaster had been removed the foul air still hung about the walls. He did not agree with many of the fashions of warming and ventilating which had been propounded by Mr. Robins. He had tried many plans, but always found all the holes stopped up within a month or so. Nothing was better than a roaring fire and open window.

Mr. G. J. Symons, F.R.S., thought the builders, and not the architects, of London deserved public censure as to the houses we lived in. There was a widespread feeling amongst the public that the architect was a lofty and exalted person, requiring large fees, and so he was often not consulted. Was it not possible to have some inferior order of professional men who would work for rather lower fees? He referred to a system of ventilation he had seen in an assembly-room at Edinburgh, where the air was removed, and fresh air supplied by two gasometer-like vessels which worked by a reciprocal motion.

Professor W. R. Ayrton thought it unwise to trust to our senses as to what was unhealthy. In Japanese houses he found people sitting over a charcoal brazier with no chimney in the room; the place became full of carbonic acid, and yet the Japanese did not seem to mind it, although he must admit that disease was very prevalent. Again, in the United States, both cast-iron and wrought-iron stoves were used, excessively annoying to an Englishman, as the carbonic acid gas passed through the iron, but the Americans did not appear to feel it, although their use of these stoves was known to be unhealthy. Was it not possible in the future many of our modern practices would be similarly deemed unhealthy? The proper mode of warming seemed, to him, to be to warm by radiation, and to admit fresh air cold, to become warmed on the walls and furniture. How this could be practically effected it was difficult to say, but just as ten years ago it would have seemed improbable that we should be able to light up large areas of London by single lights, so might they not hope for similar developments as to radiated warming, as they had seen in electric lighting? For certain purpose of calculation he and his colleague, Mr. Perry, would be glad if any member could inform them as to the highest velocity of air impinging on the human body which, at a given temperature, could be tolerated, and not considered a draught.

Lieut.-Col. Lenox Prendergast said that either of the three subjects treated upon in the paper, Warming, and Lighting, and Ventilation, would afford material for a long evening's discussion. He feared architects and those who talked and wrote on these questions forgot the very people who ought first to be considered—those who had to work and live in the buildings. It was only last week that he went over the men's rooms in the brand-new barracks at Knightsbridge, built from the designs of the late Mr. T. H. Wyatt. Here he saw Captain Galton's admirable stoves in action, and yet the long rooms, with windows on opposite sides, according to the latest theory, were so miserably cold, that the wretched men were shivering under their blankets. The opposite windows might be necessary, but why were the sills brought so low? Why were the walls only of porous brick? And why should it happen that in every room all those elaborate ventilators, described a fortnight since in that room, were carefully stopped up? The majority of people in London were living in houses which they had not designed nor built, and they wanted to know, not how a healthy house could be built, but how to make existing houses habitable. In his own house he had made experiments. It was impossible to have openings through an ornamental stone front, so he tunnelled under it, and laid sweeping-flues of terra-cotta, through which he drew in a supply of air, filtered but cold; he also provided special chimneys for carrying away the foul air, and the system had been a complete success.

It being now 10.30 p.m., Professor T. H. Lewis moved the adjournment of the debate, and this was agreed to, the President stating that as the next meeting was already arranged for, the discussion would probably be resumed on the 17th January. A cordial vote of thanks was passed to Mr. Robins, and was suitably acknowledged by him.

THE REPAIR OF THE CHELSEA SUSPENSION BRIDGE.

THE Victoria Suspension Bridge at Chelsea, since it has been freed from toll, and come under the care of the Metropolitan Board of Works, has been subjected to a thorough overhaul and examination, and some progress has already been made towards strengthening that structure. The bridge—as most of our readers may remember—was constructed from the designs of the late Mr. Page, and was considered one of his most successful structures architecturally. The future demands upon it were, however, much under-rated, and it has had the reputation of not being so strong as it might be. Under heavy traffic considerable vibration was experienced, besides the lateral oscillation or swing due to side wind, and almost inseparable from chain structures. The works now being carried out under the general supervision of Sir Joseph Bazalgette, assisted by his son, by Messrs. Appleby Bros., contractors, of Cannon-street, mainly consist in strengthening the structure against both these movements by the introduction of an additional chain on each side, and by means of lateral braces from the towers.

One of the first objects in the repair of a bridge is to examine and make good any defects in the girders and plates of the roadway, and, with this in view, one-half of the bridge has been laid bare, and is now undergoing reparation and relaying, whilst the other half is in use for traffic. The centre part of the roadway is constructed of curved iron plates, and it was the condition of these which gave some uneasiness, as it is of the utmost consequence they should be protected from the infiltration of wet from the roadway, and be covered by some impermeable coating before the paving is laid.

An inspection of the works going on enables us to describe what has already been done to meet these requirements. The chief structural alteration will be the addition of another upper chain on each side, making, with the two original, three chains, and such a connection between them as shall insure each of them receiving a share of the load. The engineer's plan to accomplish this is exceedingly simple and effective. The present chains are connected together at intervals by iron links of a form which tend to throw a severe cross-strain on the centre of the lower links of the chain, and Mr. Bazalgette proposes to relieve this strain by vertical suspending pieces uniting the pins which bear upon the lower chain links to the eyes of the new chain links, so as to distribute the weight equally between them all, and to make each link take its share of tensile strain. To stiffen the bridge against side-wind, trussed braces have been devised on the outer sides of the towers, but within the ornamental iron casings; and these towers have been further united transversely by wind-tie girders, while the anchorage of the new chains at the abutments are receiving attention, and means of adjusting them have been provided, the Diamond Rock drill having been called into requisition.

Scarcely less important is the overhauling and repair of the roadway or platform. Here we find an important alteration has been made. The old roadway was laid on buckled plates; these were tarred and concreted, and wooden paving-blocks set upon the surface so prepared. The concrete and tar has been removed and the plates examined, and the bridge is now being relaid upon a better plan. The relaying consists of a bed of concrete 6in. thick, and upon this a layer of ¾in. of Pyrimont asphalte, laid by Claridge's Asphalte Company, to secure the surface of the plates from the effect of damp. This is hereafter to be covered with wood-paving. One half the bridge has been treated in this manner with the asphalte, and notwithstanding the coldness of the weather and the vibration caused by vehicles on the other half of the roadway, the material has not suffered in the slightest degree, and from its toughness and elastic nature it is, without doubt, the best material that could have been used. No bridge roadway, especially its foundation, is, in our opinion, properly laid without a covering of good asphalte, and the engineers have seen the desirability of roofing, so to speak, the iron plates of the bridge by a layer of impermeable asphalte, like that of Claridge's, before they lay the paving. By this means all the wet will be thrown off to the sides. Many of our bridges of iron and brick—we need only instance a few of the viaducts of our metropolitan lines—are suffering from an absolute want of protection of the material, whether it be iron or brick, of which they are composed; the water finds its way through the ballast or paving, and, in time, corrosion or disintegration of the structure commences. The usual tar coating, directly the oil evaporates, becomes brittle and cracks, and is a delusive material, as it has also proved a dangerous snare to the contractor. Asphalte, for the protection of the very bone and sinew of our structures, is the only reliable material for the coating of vaults and arches; it is without an equal, and the advantage it possesses in absorbing vibration is one of its highest recommendations for bridge purposes. The structural alterations are being executed under the immediate superintendence of Mr. Bazalgette, jun. Mr. Baker, engineer, of Finsbury-place, has, we believe, devised the plan of bracing, and Mr. John Dixon is acting for the contractors.

CHIPS.

On Saturday afternoon two corner-stones were laid of the new Trinity Church schools, Rossendale. The schools are being built from the designs of Mr. L. Booth, architect, of Manchester, and will accommodate about 700 children. The warming and ventilating will be by means of the patent Manchester grates.

Mr. A. M. Hiscocks, C.E., surveyor to the vestry of St. George the Martyr, Southwark, was entertained at dinner on Thursday week by members of the vestry and other residents, and was presented with an address and a purse of 125 guineas, as a mark of appreciation of the manner in which he has discharged his duties during the past ten years.

A special meeting of the town council of Pembroke was held on Thursday week to consider the desirability of providing works of water supply for the borough, a limited company formed for that object having collapsed. After lengthy discussion, a resolution was passed that the town council now take the matter into their own hands, and will endeavour to ascertain the best way to provide the town with water, a competent engineer to be engaged to ascertain where water can be found.

The accommodation at the workhouse infirmary at Wakefield being insufficient, the Wakefield board of guardians instructed their clerk at their meeting last week to write to two local architects, Mr. W. Crutchley and Mr. Watson, asking them to inform the board in writing upon what terms they would prepare plans and estimates for an enlargement of the building.

On Sunday a new Roman Catholic school-church, dedicated to SS. Aidan and Oswald, was opened at Dryclough, near Royton. The building may be described as a free treatment of English Gothic. The whole has been carried out from the designs and under the superintendence of Mr. Thomas Mitchell, architect, of Oldham. The cost is £2,200.

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ILLUSTRATIONS.

MR. JOHN O. SCOTT'S REJECTED DESIGN FOR THE WEST FRONT OF ST. ALBAN'S.—SKETCHES AT FRANKFORT, FREIBURG, AND BERLIN.—OFFICES IN ADDLE-STREET.—LICH-GATE AT SPEEN CHURCH, BERKS.

OUR LITHOGRAPHIC ILLUSTRATIONS.

MR. JOHN O. SCOTT'S DESIGN FOR THE WEST FRONT OF ST. ALBAN'S.

This drawing is a sketch design prepared by Mr. John O. Scott some months since, as a suggestion for the treatment of the front. It was prepared after Sir Edmund Beckett had already made two or more designs, and the large flanking turrets were in their general idea taken from these. The design has the merit of retaining Wheathamstead's great west window, and such original features as remain. The arcades above the rich portals are founded on traces which have been discovered. The upper turrets are shown over the old staircases, and the three great portals, though they have not been worked out fully in detail, indicate the elaborate design which the numerous beautiful fragments found prove to have existed.

SKETCHES FROM BERLIN, FREIBURG, AND FRANKFORT-ON-MAIN.

Our double page of old work illustrations to-day comprises a selection which we have chosen from the first volume of Mr. Bernard Smith's entirely fresh work, entitled "Sketches Abroad,"* in four series, which has just been published. The separate parts are to be divided as follows:—1st series, Germany and Switzerland; 2nd, Sketches in Spain; 3rd, ditto in Italy; and 4th, the same from France, each book consisting of thirty plates. Judging from the volume now before us, "Sketches Abroad" will not only be found very interesting as a comprehensive collection of sketches, but as a practically useful series of suggestions in design, while the plates have the advantage, which amply compensates for the somewhat rough finish of some of them, that all are fac-similes of the original sketches as completed on the spot. As a whole, the drawings certainly seem reliable, and the subjects illustrated have been chosen entirely from an architectural point of view. They include examples of old houses, town-halls, picturesque bits of street buildings, wood and metal work, and furniture, as well as needlework, &c., from Berne, Basle, Lucerne, Freiburg (Baden), Strasburg, Frankfort, Mayence, Bacharach, Andernach, Cologne, Heidelberg, Ratisbon, Wurzburg, Nuremberg, Munich, Lubeck, Berlin, &c. As a well-printed and moderately-priced book of sketches, which cannot fail to be welcomed, we recommend "Sketches Abroad."

OFFICES, ADDLE-STREET, ALDERMANBURY.

The two houses Nos. 18 and 19 in the street, the front elevation of which we give as our illustration, have been built by the Brewers' Company, from the designs and under the superintendence of Mr. E. H. Martineau. The new buildings have taken the place of two old houses which had to be pulled down, and which had nothing of interest about them with the exception of the old gateway-entrance to Brewers' Hall. This old doorway complete, with its Corinthian-capped columns and entablature surmounted by curved pediment, was carefully preserved, kept up, and incorporated with the new design. The new buildings present a mixture of red brick and red Mansfied stone, the cornices and strings being of moulded bricks; ornamental red terra-cotta panels, specially made by Messrs. Blanchard from the architect's designs, are worked in with the brickwork. Portland stone is used for the dressings of windows in the stories above ground-floor story. The carving on stone shields in the pediments, in the principal one of which are the arms of the Brewers' Company, was executed by Mr. L. T. Carter. Mr. E. Lawrance was the contractor, and Mr. T. Spooner, the clerk of works. The back of these two houses forms the south side of the courtyard of "Brewers' Hall," which was built soon after the Fire of London, and is rather a curious specimen of the period. We shall hope in some future number to be able to give illustrations of the old hall, from Mr. Martineau's sketches and drawings.

LICH-GATE, SPEEN CHURCH, BERKS.

The lich-gate which we illustrate to-day has lately been erected at the north entrance to the churchyard of the handsome and picturesque church of Speen, in Berkshire. It is the last of a series of restorations and additions, which have been carried on by the late vicar, the Rev. Henry Majendie, and his successor, the Rev. Reginald C. Edwards. The framing of the lich-gate is entirely of oak. Broseley tiles are used for the roof. The architect is Mr. G. Atkinson Barnes, of Newbury. The contractors, who also carried out the church restorations, are Messrs. Wheeler and Son, of Reading.

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THE GLASGOW ARCHITECTS AND THE MUNICIPAL BUILDINGS COMPETITION.

The Glasgow architects, last week, declined to follow the course of action suggested to them by the council of the local Institute of Architects. The council proposed that the following letter should be sent to the Glasgow Town Council:—

"Gentlemen,—The Glasgow Institute of Architects, having had under serious consideration the results of the recent competition for the proposed Municipal Buildings, has, at a special general meeting of the body convened to consider what action, if any, should be taken by the Institute in the circumstances, resolved respectfully to bring under your notice the following suggestions in the hope that they may be useful and not unwelcome at the present juncture:—

"1st. Should the Town Council decide upon selecting one of the designs already submitted to them, the Institute desires to point out that it would be exceedingly unfair to those who have faithfully endeavoured to adhere to the conditions imposed upon competitors if any design were so selected, the cost of which would greatly exceed the stipulated sum.

"2d. In the event of the present competition being declared at an end and a new competition being decided upon, the Institute would solicit your attention to the following points:—1. It is recommended that the professional referee or referees be chosen at first, and that his or their advice be taken in the framing of the conditions. 2. That competitors be furnished with an exact statement of the kind and extent of the accommodation required, but with no plans except a block plan of the ground showing the building lines, or alternatively with plans, the arrangement of which they should be at liberty to alter to any extent and in any way they thought proper. 3. That a period of not less than six months should be allowed for the preparation of the drawings. 4. That the limit of cost should be greatly extended. 5. That it should be a condition that the author of the selected design should be employed as architect of the new building, unless it should be found that there were good reasons why he should not be so employed. 6. That the design of any competitor who violates any of the conditions should be excluded from the competition.

"The members of the Institute—the great majority of whom are citizens of Glasgow—are not actuated merely by personal considerations in thus venturing to address you; but they believe it will be found that in this instance what will be best for them will be best also for the community; and they do not doubt that, if such views as are indicated above be embodied in any new conditions of competition, there is every probability that the result would be satisfactory to all parties.

"Should you desire a fuller explanation of these views, the Institute would be glad to have an opportunity of offering this through a deputation, which would be appointed to wait upon you for the purpose."

After some discussion Mr. John Baird moved as an amendment, that the Institute delay approaching the Town Council in the mean time. Ex-Bailie Salmon seconded the amendment, and said he could not help thinking that it would be derogatory to the Institute to approach the Town Council. He thought it a kind of begging approach altogether, and, further, it was his opinion that they would stultify themselves and lower themselves in the eyes of the Town Council by doing so. He thought the letter which was being considered well prepared and very much to the point, and had no objection to it but on that score. Mr. Sellars, vice-president, said that he was prepared to move an amendment on the same lines as those adopted by Mr. Baird, but he was pleased that Mr. Baird—one of the oldest and most experienced members of the profession—by submitting his amendment, had relieved him from that responsibility. It had been a matter of some regret (to the speaker) that at this the first meeting of the Institute for the season he found himself in opposition to the president. He sympathised with the remarks made by Mr. Baird and Mr. Salmon, and would support the amendment. Mr. Bromhead and Mr. David Thomson both thought the Institute should address the Town Council, and the Chairman (Mr. Honeyman) said, that he did not sympathise at all with the remarks of Mr. Salmon about it being derogatory to their dignity to approach the Council in the way proposed. They did not beg to be heard, nor did they think to obtrude their advice offensively, but as representing the profession here. They were pefectly justified in offering their opinion in the circumstances, and he had no doubt it would be treated with the respect to which it was entitled.

The motion and amendment were put to the meeting, and on a vote being taken the amendment was carried by a considerable majority.

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DISCOVERY OF A ROMAN WALL IN THE CITY.

Recent excavations, made in connection with the enlargement of the Fenchurch-street Railway-Station of the Great Eastern Railway, have brought to light the remains of a rubble wall supposed to be a portion of the old Roman wall. Mr. Alfred A. Langley, the Engineer of the Company, in a letter to the *Times* says: "this wall extends in a northerly direction on the north side of the existing railway works." Another correspondent ventures to question whether the wall be a part of the old Roman wall, but our inspection of the work leads us to the conclusion that it is. The wall has been found about 10ft. below the ground or road-surface, and is at least from 7ft. to 7ft. 6in. thick. It is composed of mountain limestone-rubble, with layers of Roman tile every few courses. There appear to be two layers of tile to six of rubble, the tiles are about 18in. by 12in. and 1$\frac{3}{4}$in. in thickness, and are laid in mortar of a coarse reddish kind, though so tenacious that the contractor has some difficulty in removing the courses. The excavation has reached the bottom of wall, and the height is about 8 to 10ft. In the wall has been found also a flue of Roman tile measuring 13in. square. It is thought that further excavations will reveal the old subway which ran in this direction, a portion of which may be seen under Barber's cellars. The subway is about 6ft. by 4ft. and is arched in brick. Mr. Milliken, in his letter to the *Times*, describes the course of the old London wall in this part. He says: "Running northwards from the river, it would, if restored, start from a point a little to the east of St. Thomas's Tower (the Traitors' Gate) across the White Tower, to a point midway between the Flint and Bowyer Towers in the Tower of London; thence to the postern and along the east side of Trinity-square (where a piece of it may yet be seen); and then between Jewry-street and the Minories to Aldgate, and so along Duke-street, Bevis-Marks, Camomile-street, Wormwood-street, &c." The same writer suggests that the wall discovered might be usefully compared with other fragments, namely those on Ludgate-hill, in St. Giles's Churchyard, Cripplegate, in London-wall, and in the yard of 35, Trinity-square, all of which are above the levels of the ground. The wall discovered at the Fenchurch-street station formed the foundations of the old houses which have been pulled down to make room for the proposed extension. Those who are interested in the subject had better lose no time in inspecting this newly-found relic, as the wall is now being removed for the new foundations.

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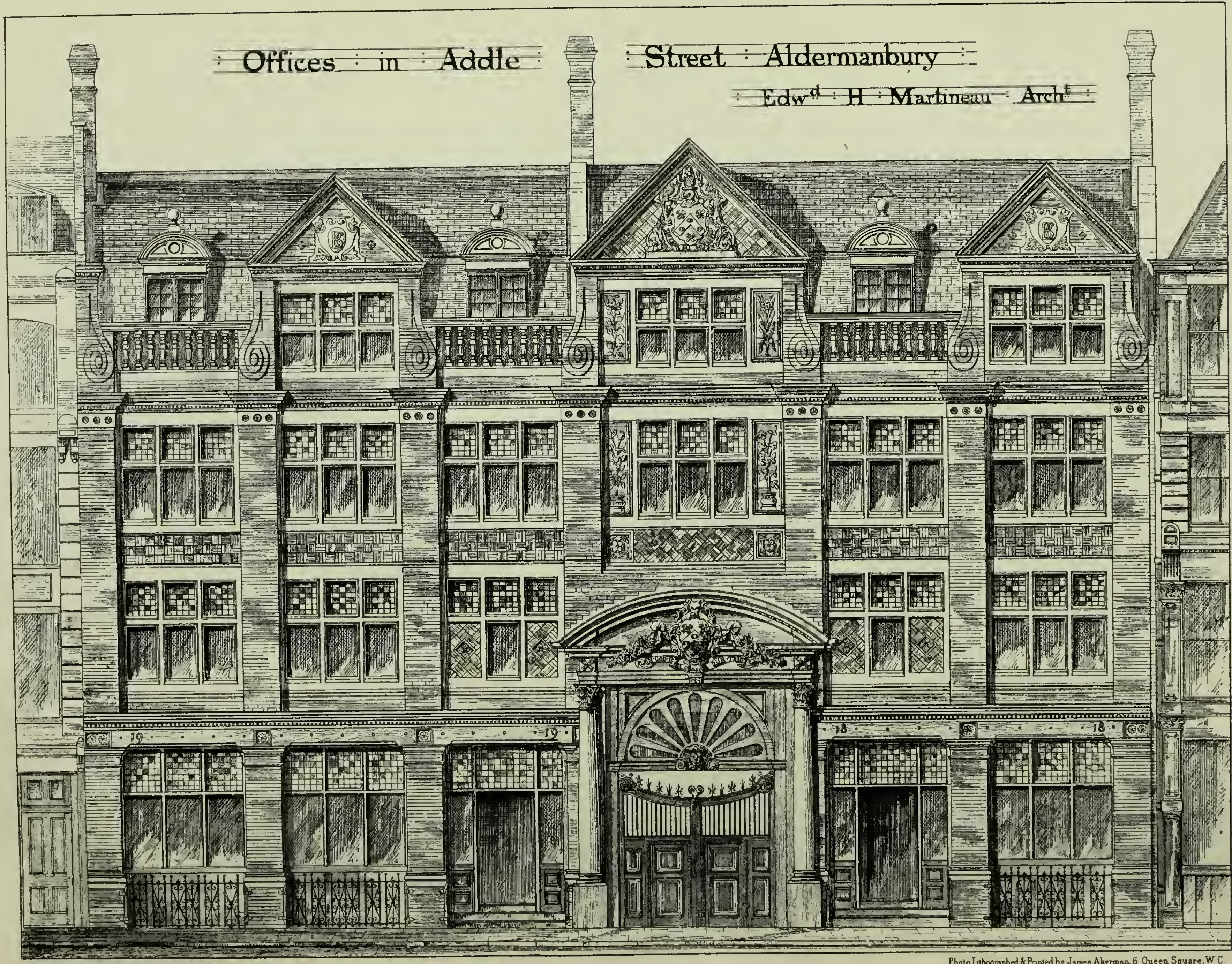
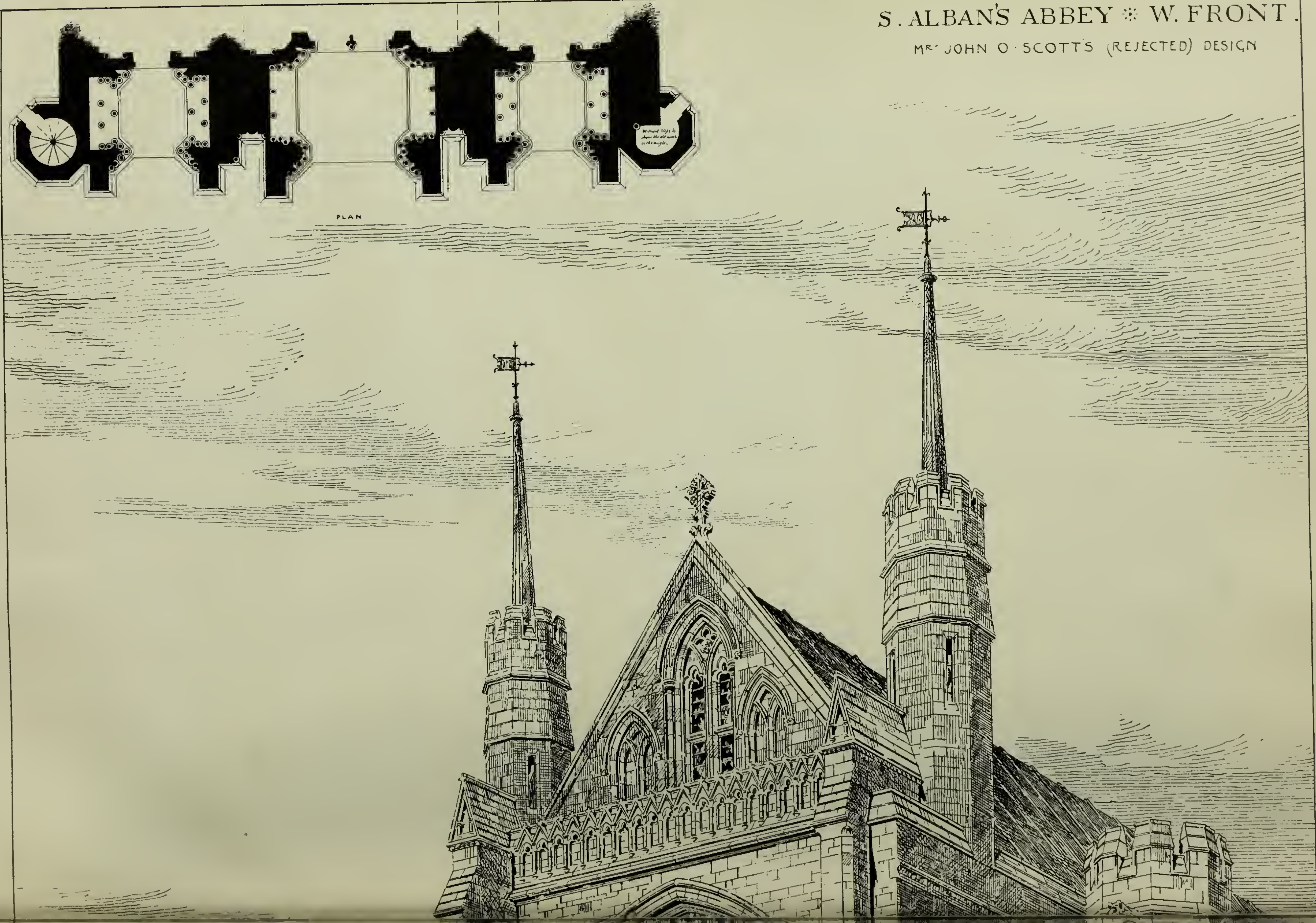
* Sketches Abroad, made whilst Travelling Student of the Royal Academy. By Bernard Smith, architect. Batsford, 52, High Holborn.



Offices in Addle Street Aldermanbury

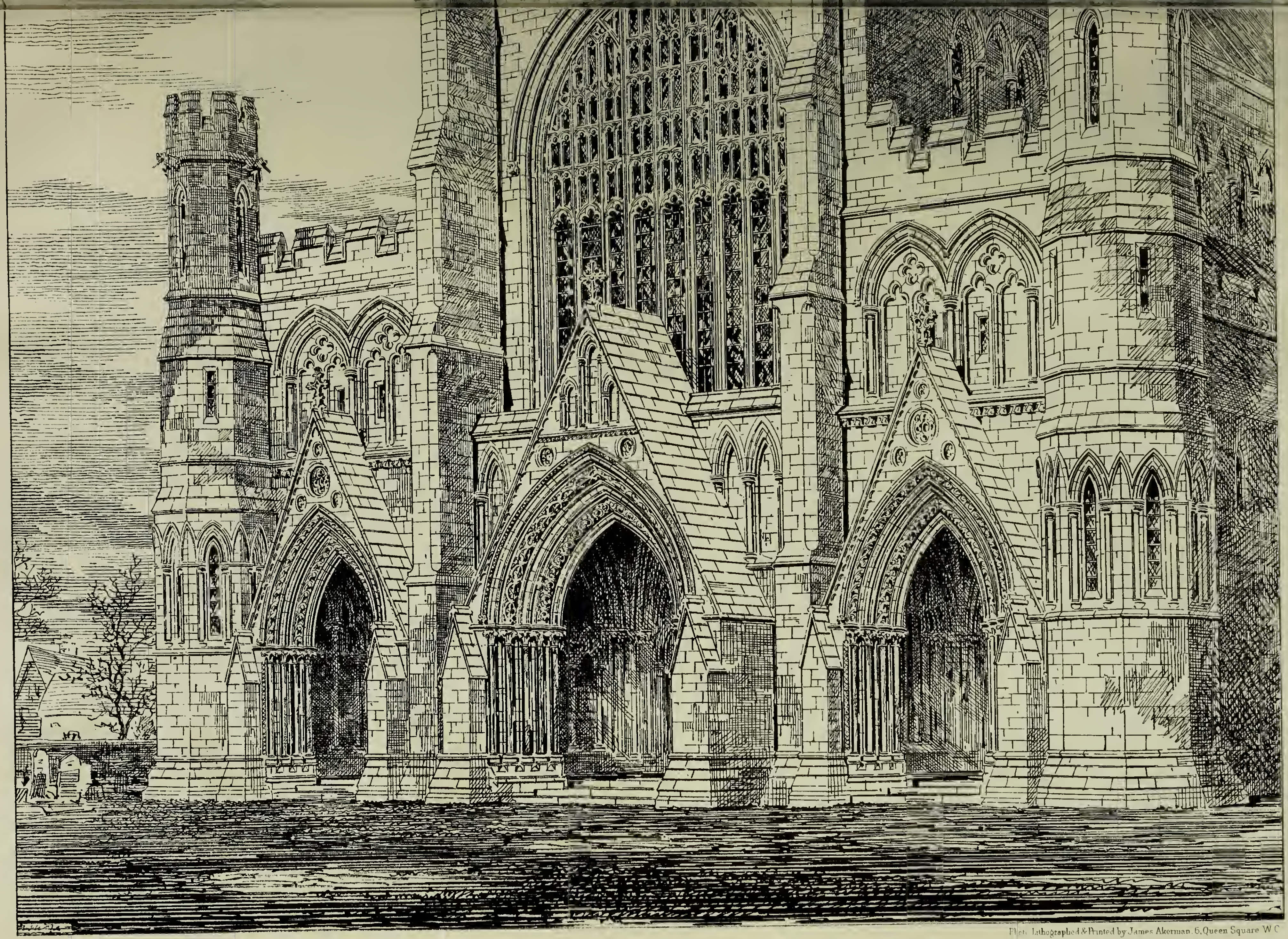
Edwd H Martineau Archt

Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



S. ALBAN'S ABBEY ⁘ W. FRONT.

MR. JOHN O. SCOTT'S (REJECTED) DESIGN



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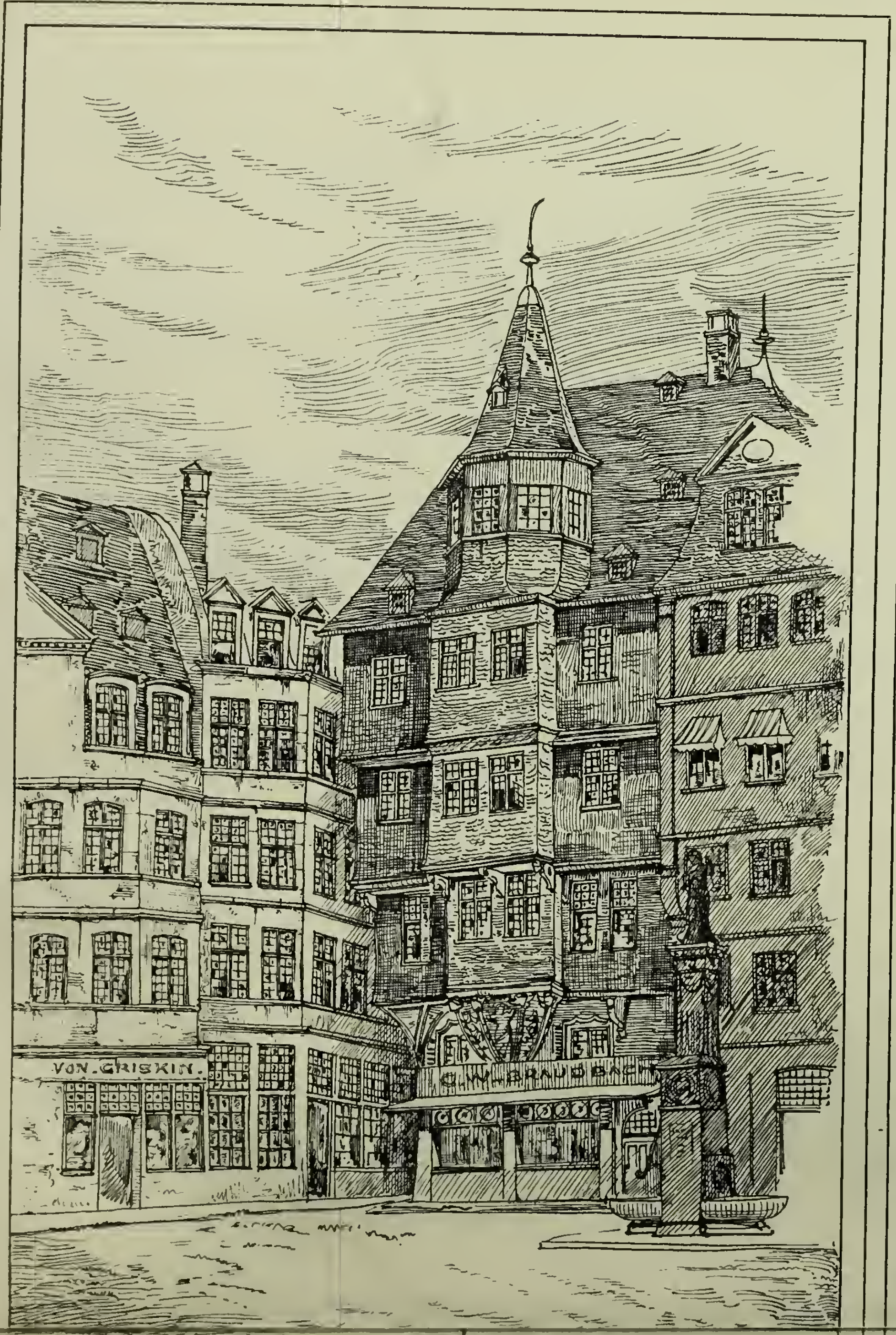
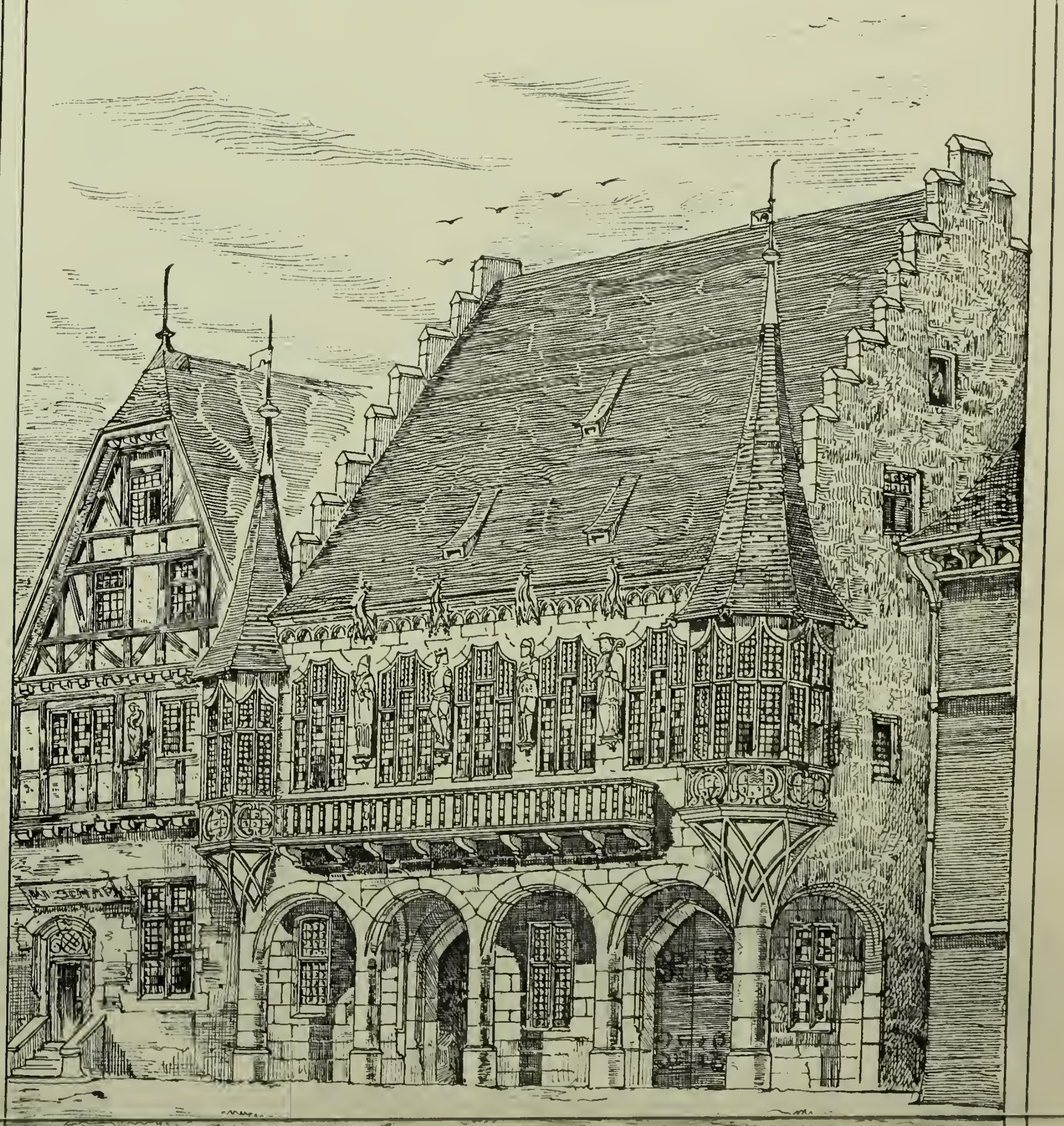
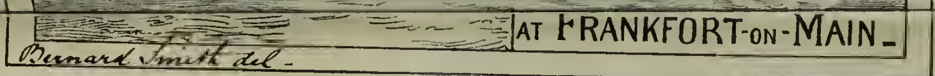


RATHAUS . FREIBURG

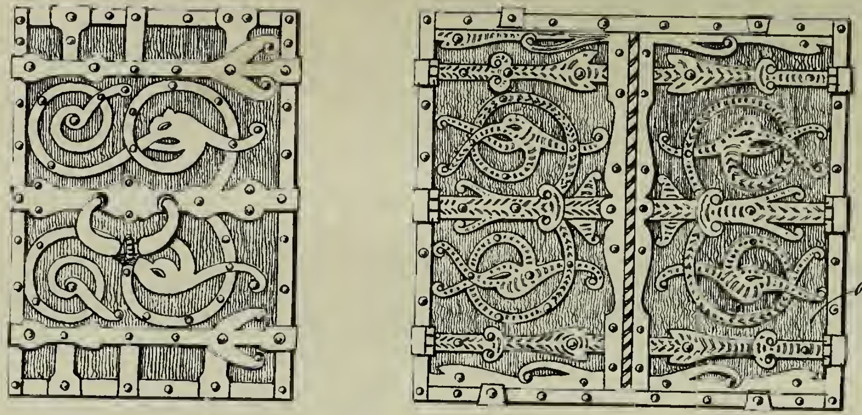



AT FRANKFORT-ON-MAIN-

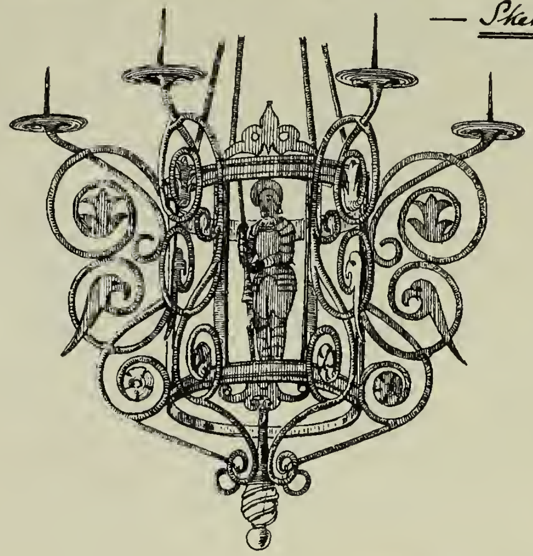
Bernard Smith del-

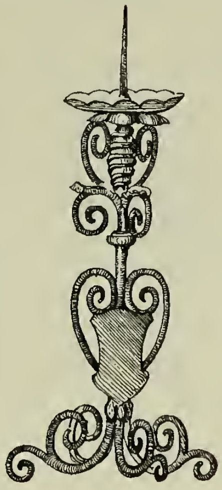
Bernard Smith del-

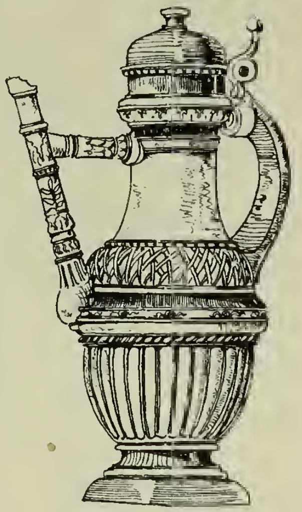
Berlin - in the "Gewerbe -
Museum". Aug./77-

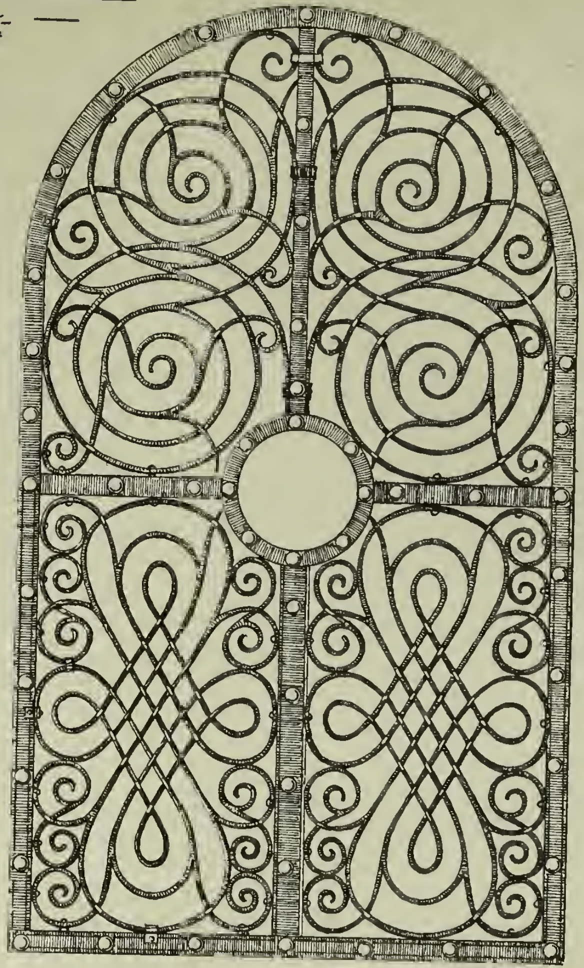


— Sketch of Iron Casket —


— Wrought Iron Hanging Lamp 16th Cent. —


— Iron Pricket —


— Drinking Vessel —


— Wrought Iron Grille —

—Bernard Smith del—

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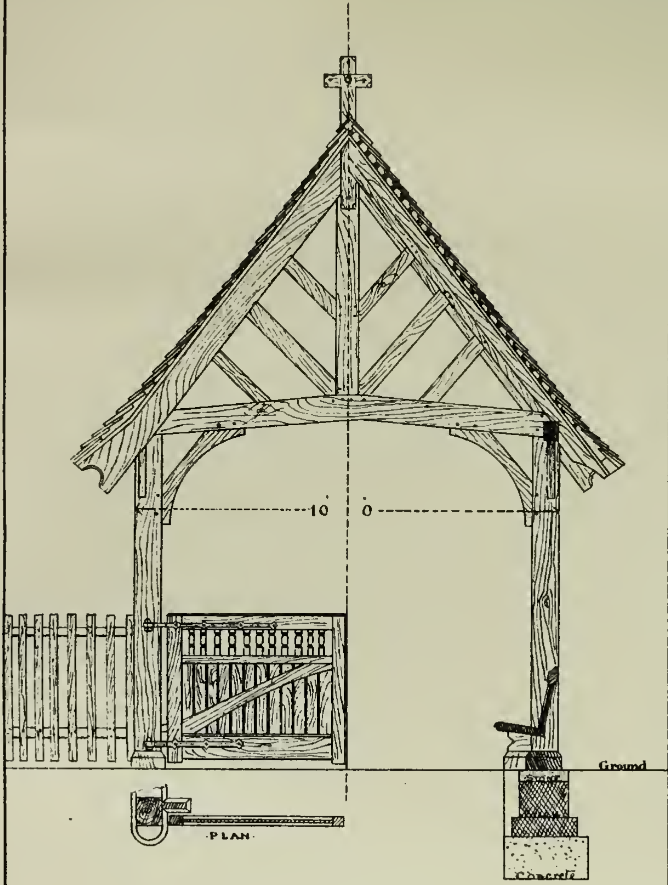
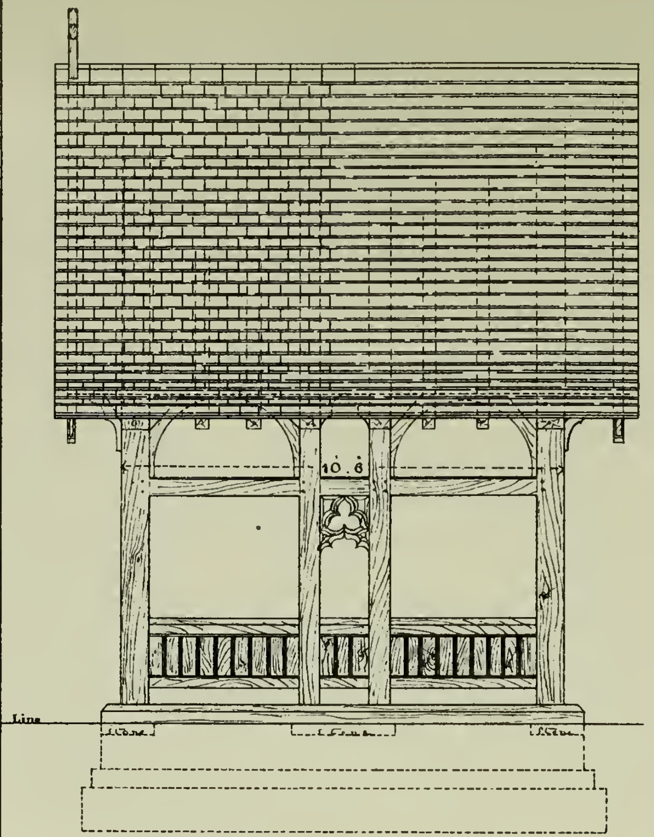
· LICH · GATE · SPEEN · CHURCH · BERKS ·

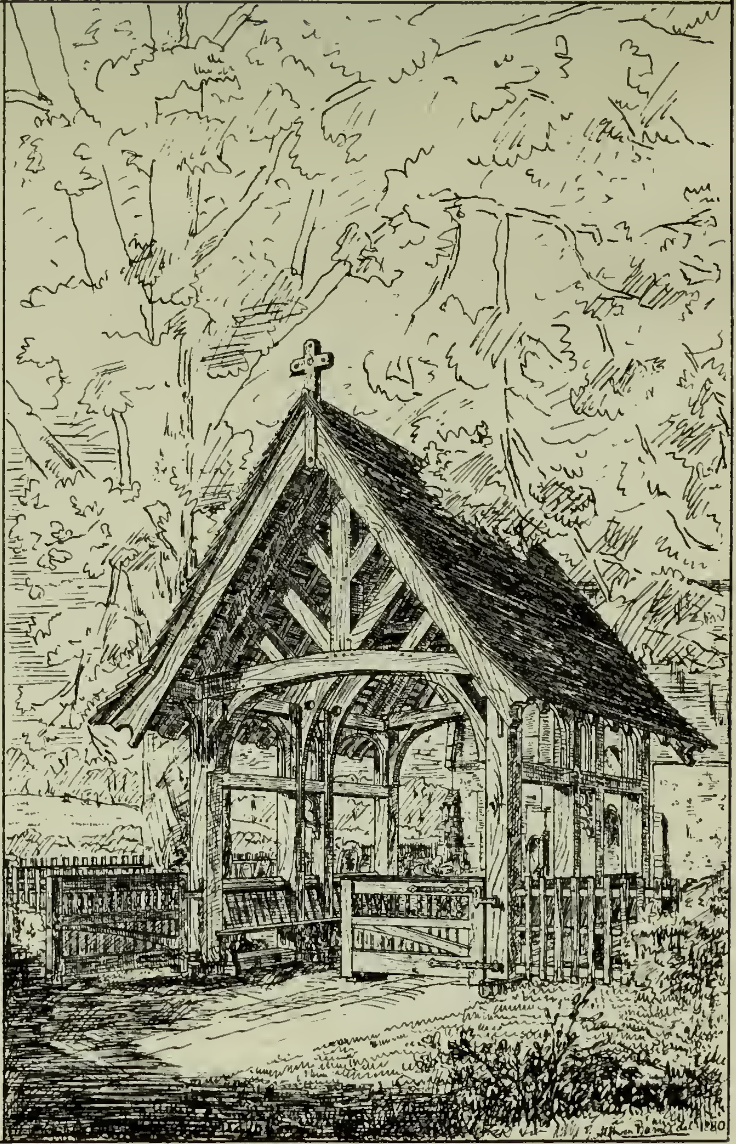


HALF ELEVATION · HALF SECTION ·



· SIDE ELEVATION ·

· G. Atkinson Barnes ·
· Architect ·



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THE LAW AS AFFECTING QUANTITY-SURVEYORS.*

(*Continued from p.* 630.)

LET us now pass to the quantity-surveyor's rights and his remedies. As to these, it must be admitted that there are some points on which amendment is greatly to be desired. When the quantity-surveyor is employed and paid directly either by building-owner, or builder, the matter is simple enough. To his employer only is duty due, and by him only is fee or reward to be paid. The building-owner employer cannot complain of mistakes which only harm the builder, nor can the builder complain that his quantity-surveyor has erred to the detriment of the building-owner. But such direct and separate employment is not the rule, but the exception. The quantity-surveyor usually comes upon the scene thus:—The building-owner selects his architect, giving him his rough idea of what he wants, and the price to which he means to go. If the work is to be done by contract, the architect, having prepared his plans and specifications, hands them to the quantity-surveyor, thus acting, as is generally understood, as agent for, and on behalf of the building-owner. At this point, then, the quantity-surveyor is working for a principal whom he has never seen, who is probably ignorant of his name, and has the mistiest possible notion of his calling. Yet, at this stage, the quantity-surveyor is on his firmest vantage ground. He has done his work for a known and responsible employer, who may abandon his scheme, and put the bills of quantities in the fire. If he does so, the quantity-surveyor is in clover, and the building-owner's liability is undeniable. This was decided in 1837, in the well-known case of "Moon v. The Guardians of the Witney Union." Supposing, however, that a tender is accepted, and a building contract signed, the contract with the quantity-surveyor shifts from the building-owner to the builder. This custom appears to have been so well established when "Moon v. The Witney Union" was decided that neither party endeavoured to dispute it; Chief Justice Tindal interpreting the contract as a conditional one, under which the plaintiff was to be paid by the successful competitor, if there were any. The decision has repeatedly been cited and followed in trials at Nisi Prius, but it is always desirable to vivify the fossil of the report by *vivâ voce* evidence that the custom there mentioned is still recognised as binding by all parties concerned. Assuming, however, that "Moon v. The Witney Union," is of great weight as an authority, it fails to cover the whole of the ground which the quantity-surveyor would like to make his own. In practice, when all runs smoothly, the money comes to the quantity-surveyor by the builder's hand, but from the building-owner's pocket. The builder is not only at liberty, but is generally required to include the cost of the quantities in his tender for the works. Very frequently also the contract provides that the quantity-surveyor shall be paid out of the first sum for which the architect certifies; and, whether this be so or not, it would seem, alike from "McConnell v. Kilgallen" decided 1878, and from the general rule of law, that, when no term of credit for work done or goods sold is fixed by contract or custom, the price is payable forthwith. Every wise quantity-surveyor will act upon this rule, because, if he good-naturedly refrains from pressing the builder who has not received the price of the quantities, he will run the risk of losing the reward of his labour altogether. For, granted that, when the building contract is signed, the quantity-surveyor's contract shifts from building-owner to builder, and granted also that, as soon as it has so shifted, the quantity-surveyor can sue the builder, the *primâ facie* inference is that it so shifts at once, unconditionally, and for all purposes. If so, the remedy against the building-owner is gone for ever. But this rule, which looks so charmingly legal, may, under certain circumstances, seem the very reverse of equitable. In one case, a builder had contracted upon quantities carefully prepared, and of which the building-owner had the ordinary benefit when making the contract. Payments were made on account; but, as from them the quantities were carefully excluded by the special direction of the building-owner, the quantity-surveyor had not the heart to press a man who was hard up, to pay the money out of his own pocket. The builder went into liquidation, having received several hundred pounds within the certificate margin, but neither circumstance was deemed sufficient to entitle the quantity-surveyor to recover from the building-owner. Apart from custom, such a ruling is perfectly right, and the case is of sufficiently frequent occurrence for it to have become the custom that the shifting of the contract from building-owner to builder, is subject to the further condition that the former remains liable until he pays the latter. Some evidence to this effect was given, but not enough to satisfy the judge who tried the cause. Should such a question again arise, it might be possible to fortify the evidence in support of a custom which has both justice and reason to recommend it. If, however, "shifting at once and forever" doctrine is to be accepted as the true one, the building-owner is in the happy position of having been helped to make a beneficial contract by a highly-trained professional assistant, to whom he is not bound to pay a penny; and still harder, the more care the quantity-surveyor has taken of the building-owner, the greater the probability that he will get nothing for it. Amongst competing builders, the lowest tenderer is often financially the weakest, and to him, therefore, payment for quantities out of his own pocket, before the building-owner has paid him, would involve difficulty in meeting the more imperiously-urged demand of the British workman on Saturday afternoon. The quantity-surveyor knows this, and does not like to grind the face of the poor. He hopes, and waits, till the works stop; a state of things the more likely to occur if the quantity-surveyor has so done his work as to leave little room for contingencies in favour of the builder, to whom a plus of five per cent. may make all the difference between pulling through and pulling up. The rigorously faithful quantity-surveyor saves this five per cent. for the building-owner. The builder fails before paying for the quantities, and he has to put up with a dividend of nothing in the pound, while his professional brother, who is more lax or more indulgent than himself, gives the margin, which enables the builder to hold on, and eventually to pay him his money. Still, all things have their compensation, and if the building-owner is to claim the benefit of non-liability to the quantity-surveyor, the latter may fairly disclaim the burden of responsibility to him. Liability for negligence may arise either from duty or from contract. The obligations of a quantity-surveyor do not arise from duty, for there is no common law duty binding any man to set himself to the head-aching work in which a quantity-surveyor spends his life. They must therefore be founded on contract, and a contract which presupposes reward. If, therefore, the contract shifts from building-owner to builder, as soon as the contract is signed, the responsibility should shift with it. That the builder cannot sue the building-owner for inaccuracy in the quantities, was decided in "Scrivener v. Pask," where a builder failed in an endeavour to make the owner liable for inaccuracies in the quantities, which had involved him in serious loss, though he might well have maintained an action against the quantity-surveyor, whose fees he had paid. On analogous principles, the defendants in "Thorn v. The Mayor of London" were held not liable to the contractor for Blackfriars Bridge, because a certain specified and economical mode of construction was found impracticable. The builder, who pays the quantity-surveyor for his work, has a good cause of action against him if the work be badly done and injury to him consequently ensues. But who is to sue when every mistake is in the builder's favour? Not the builder, for he is not only not damnified, but directly benefited. Not the building-owner, for as against him, the quantity-surveyor has lost his rights by the shifting of the contract; he can have no cause of action upon a contract to which he has ceased to be a party. The building-owner has assented to the transference of his own pecuniary liability to the builder, and so has become a stranger to the contract. He does not warrant the accuracy of the quantities or the practicability of the work. It would therefore be anomalous in the extreme, if, being neither liable to the quantity-surveyor, nor responsible for him, he could maintain an action against him. But it must be admitted that something is to be said on the other side. In bailments and other employments involving trust or confidence, the very reposing of such trust is a consideration sufficient to support a contract to perform the duty or trust which the law will imply as against the bailee or trustee. To sum up—the quantity-surveyor's legal position is as follows:—His obligations are reasonable competence for his work; reasonable care and skill in his work; and the highest honour in the performance of his work. Employed by the building-owner, through the architect, who, for this purpose, is the owner's agent, his remedy is against the building-owner up to the signing of the builder's contract. When this has been done, he may sue the builder for his fees, unless he has agreed to wait till the building-owner has provided funds for the purpose; but, if he waits till the builder has failed, he cannot, in the absence of contract or cogent evidence of custom, recover from a building-owner, who has had all the benefit of his work, and has paid neither builder nor quantity-surveyor for it. This hardship is somewhat mitigated by the probable, but by no means certain consequence that after the builder has signed the contract, the quantity-surveyor is liable to him alone; though the proposition, that such a building-owner may maintain an action for negligence in doing work for which he is not bound to pay, is fairly arguable. Whether it is or is not ultimately sustainable is probably of interest rather as a legal moot than as a practical point. It would be possible for the Council of the Institution of Surveyors, either alone or in conference with architects, builders, and others practically conversant with the subject, to frame a set of rules which might be so incorporated into every contract as to free the profession from any cause of complaint as to the legal position of quantity-surveyors.

SAFETY ARRANGEMENT FOR WATER-PIPES.

IN order to obviate the very common evils connected with the bursting of water-pipes in winter, Herr Weissbarth has contrived an arrangement (we learn from the *Deutsche Industrie Zeitung*) by which any water that may escape thus is carried off into the street-drain or a cesspool, and, at the same time, a cheap mode of heating the whole pipe system with a single gas or petroleum flame is rendered possible. The entire system of water-pipes, which, as in every right arrangement, must have, in all its branches, falls towards the ascending pipe, is (inclusive of the ascending pipe) inclosed in sheet zinc pipes of 5 to 8ctm. internal diameter; so that water finding exit at any part of the system gets into the inclosing pipe, and is carried away. The inclosing zinc pipes, about 1 metre long, are not soldered at the joints, but stuck into each other like gutter or waste-pipes, and the water-pipes, of lead or iron, are fixed in the others by means of rings with small projecting pieces bent at a right angle, which catch in metallic tholes soldered on the interior of the zinc pipe. The lowest inclosing pipe has a bottom, through which the water-pipe passes tightly, and close above this is the tube by which the escaping water is carried off to the drain. In order to get at the water-pipe without having to take the zinc pipes out of each other, some of these are furnished with doors 70 to 75ctm. long and 5 to 6ctm. wide, which are easily slid within the tube, as they are led above through a soldered metal ring, and below through packing; the latter at the same time prevents the water flowing out between the doors and the pipe; moreover, the longitudinal borders of the doors are packed interiorly, so that the water follows the packing and does not issue by the door. The fixing of the zinc tubes to the walls is effected with rings on which they are supported with noses. Branch pipes are soldered into the main pipe. When, in a branch pipe, stopcocks occur, the inclosing pipe is there perforated for the spindle and stuffing-box. In the longer branch pipes, as in the vertical ascending pipes, doors must also of course be introduced in the inclosing pipes, the openings being naturally on the upper side. At places where the ascending pipe is exposed to cold, as, e.g., in water-closets or entrance halls, the arrangement permits readily of a warm air-current being produced in the inclosing pipe, by means of a gas-flame (which may also serve in illumination). To this end the pipe is furnished with an oblique branch directed upwards, and bent round to terminate in an iron or brass funnel, under which the gas or petroleum flame burns. The heat then passes into the inclosing tube. In the air-box above holes are provided to let the air escape, and good ventilation may thus be secured.

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* A paper read before the Institution of Surveyors by F. Turner, barrister-at-law, Nov. 22, 1880.

In order to facilitate repairs, the water-pipe, at the middle of the doors of the inclosing pipe, is formed with brass connecting screws. But the use of the ordinary soldered junction does not present any hindrance by reason of the zinc tube. Nor are any other serious difficulties, it is said, encountered in the working of the system.

CANTOR LECTURES ON POTTERY AND PORCELAIN.

IN his second lecture, given on Monday last, Professor Church dealt with vitreous, plumbic, phosphoric, and other glasses and enamels, and iridescent and metallic lustres, in pottery. He stated that what was called the refractory quality of the glaze was produced by alumina, lime, and baryta. Hardness was imparted by silica. The fusible element of paste and glaze were the alkalies, soda and potash, also lead and boracic acid. The heavy metals, as oxides, formed calorific substances. Opacity was produced by oxide of tin and sulphate of lime, amongt other things. Displaying specimens which illustrated excellence in these several qualities of glaze, he remarked that Japanese samples of old pottery were rare, and were getting more so. In studying the various kinds of enamel, there had to be considered the transparency or opacity, as the case might be; the colour, in relation to its condition, whether above or below the glaze, or distributed throughout it; the surface, whether perfectly or half-polished—whether it had a metallic iridescence or a pearly lustre. On examining specimens of ancient glazed bricks and terra-cotta, it was found that they contained a large quantity of soda. The Babylonian and Assyrian bricks, 2,400 years old, contained silicate of soda as the base of the gloss; and copper, lead, and even antimony formed the basis of colouring. Old Indian enamels had the same character, and he showed a specimen dating from not later than the 15th century. The basis of turquoise blue and cobalt blue was found to be silicate of soda, tinctured with copper and the oxide of cobalt. Lead gloss could be distinctly traced back to the second and first centuries. Upon two Roman lamps discovered in England, the colour of green upon them was found to contain a large proportion of oxide of lead. This gloss was used both in Albion and Gaul, but was carried to a later period in the former country. Tin was present in enamels discovered in England, Spain, and Italy, and belonging to the Middle Ages. As to colours, those known as encaustic were largely used by Wedgwood. The colour was incorporated in the clay. Enamel colours were practically glass. The turquoise blue on some of the Japanese vases might be deepened and given a greater apparent antiquity by dipping in red ink; the colour was also improved in such a manner by dipping in a solution of Prussian blue or indigo. Manganese, when pure, gave a good blue or bluish violet; but potters who were anxious to secure good colouring too often sent to any and the nearest chemist's shop, and got black oxide of manganese, and the resulting colour, instead of being bluish, was a sort of brown. Chromium highly oxidised gave a good yellow, but in other proportions of combination it gave a beautiful pink, well known in potteries. The lustre of old Staffordshire pottery was excellent. Lately, in Chelsea, a successful attempt had been made to reproduce the old Spanish and Italian lustres. The effect was produced by introducing silver compounds into the glaze, and a number of delicate mother-o'-pearl tints were to be seen. With the use of copper, fine red lustres were attained. The old Italian recipe was followed. In conclusion, the lecturer drew attention to some of the specimens of pottery before him, among which were some pieces of English manufacture which equalled the old Italian production, articles of Persian ware, richly inwrought slabs, tiles, salvers, cups and saucers, plates, and vases, forming altogether a varied and interesting collection. He announced that Salt-glazed Stoneware would be the subject of his next lecture.

SCHOOLS OF ART.

Carlisle.—The annual meeting of this school was held on the 25th ult., under the presidency of the Mayor. The report stated that there were last year 154 students, a decrease of 6 on last year, and of 26 on the previous year, and the debit against the treasurer had increased from 18s. to £15 16s. Fifteen prizes had been gained against seven last year, including a Queen's prize at the national competition. The chief local prize, a silver medal, given for the best drawing from the antique, had been taken by G. H. Moss.

St. Martin's-in-the-Fields. —The annual meeting of these schools, situate in Castle-street, Long-acre, was held on Friday evening. The head-master, Mr. Parker, reported that, as compared with the past ten years, there was an improvement in the character of the results, as tested by prizes. In the first grade, 6 certificates had been gained, as against 5 last year; in the second grade, 11 against 14, but one had passed in all four subjects, and would have been entitled to three prizes, had the rules allowed their award; in the third grade, 18 prizes against 12; but there had also been gained four as against three free studentships, and also three book prizes, three bronze medals, and one of the ten gold medals awarded by the department. Mr. Hubert Herkomer, A.R.A., who distributed the prizes, spoke in high terms of the head-master's work as a teacher and skill as an artist, and mentioned that many years ago they were fellow-workers in the school at South Kensington, when they uncompromisingly sketched each other. He had examined the work which had won the gold medal, done by Mr. F. Herrington, who, he was told, was a die-sinker by trade; it consisted of drawings from the life, and was most admirable and painter-like; but it indicated one of the dangers of using chalk, because of the danger of indulging in mere fumbling. The awards generally showed that the department was not deserving of all the blame cast upon it, but that prizes were awarded rather to work that departed from the routine and the monotony of the average school of art, than to mere draughtsmanship, and that the more artistic, the more freely artistic a student's work was, the more prizes was he likely to gain. Mr. Herkomer then delivered an address to the students, in which he pointed out the necessary evils of the prize and competition system, and while he admitted that they could hardly help striving for prizes from loyalty to the school and from their own ambition, he urged them to remember that the best master could only assist their training themselves, applying advice in their own way, and insisted on the importance of dedication and self-instruction. Above all, simple hard work was necessary; any success he himself might have gained was the result of being a hard worker. In conclusion, he warned them against mistaking a love of art for ability, and suggested that the great want of our schools was life-work done in the spirit of the antique. He introduced to them Mr. Seymour Lucas, who, as a former student at St. Martin's, acknowledged his indebtedness to the Gilbert Sketching Club, where he learned how to design and compose a picture, and begged his successors in school-life to work, not for gold medals, but from love.

COMPETITIONS.

Raikes Memorial Church.—It seems in this competition, no restriction was made as to motto or name, and many competitors preferred to attach their name. Forty sets were received; these, the committee reduced to eleven, and packed and returned the rejected sets. The eleven selected sets were removed to the residence of the chairman, for further consideration. Of the eleven so selected, five are by local men.

A new coffee-tavern has been erected at Caterham. Its total cost will amount to about £2,000. The builder is Mr. Charles Scrivener, of Caterham; the architect, Mr. R. Martin; the fitter, Mr. Hogben. The elevations are of pale straw-coloured bricks, from Betchworth, relieved with red brick arches, string-courses, &c. The principal feature in the exterior is the shop-front, which is after the style of the latter part of the 16th century. The prevailing colours of the shop-front are chocolate and buff, relieved with lines of red.

PARLIAMENTARY NOTICES.

Open Spaces in the Metropolis.—It is intended to introduce into Parliament next session a Bill to amend, extend, and enlarge the provisions of the Metropolitan Open Spaces Acts, 1877, and to enable the Metropolitan Board of Works and any vestry or other parochial or local authority and the Corporation of the City of London to purchase or otherwise acquire the soil of or any limited estate or interest in, or the control over, any open spaces within the limits of the metropolis, to devote them to public recreation, and to apply funds, rates, or revenue to their purchase, &c. The Bill will also enable agreements to be made with the owners, trustees, and others interested, with respect to the objects contemplated; and will provide that disused churchyards, burial grounds, and cemeteries, shall, subject to such ecclesiastical sanction as the Bill shall provide, be treated as open spaces.

Sea-Water Supply to London.—In the ensuing Session of Parliament leave will be asked to bring in a Bill for the incorporation of a company, with powers to construct conduits, reservoirs, a pumping station and other works, between Lancing, in Sussex, and London.

The Water Supply of the Metropolis.—Notice has been given that it is intended to apply to Parliament in the ensuing Session for leave to bring in a Bill for an Act to create a London water authority, representing the consumers of water in the metropolis and adjacent districts, with powers to secure to them an improved supply of water at reasonable rates. The Bill asks for powers to acquire and utilise existing sources of supply as far as may be deemed expedient, to make all necessary inquiries with this object, and also in order to ascertain whether recourse may not be had with advantage to sources of supply other than those now used by the metropolitan water companies. Power will also be sought by the Bill to enable the London water authority to make and carry into effect agreements for the purchase of the undertaking of the companies mentioned, "and to authorise, and if necessary, require and compel such companies respectively to sell their undertakings or any parts thereof" to the authority, and in the event of their purchase, subject to the provisions of the intended Act, to exercise all the rights and powers of the companies. The Bill asks to make provision for raising or borrowing the money and issuing the stock required for carrying into effect the purposes of the Act on the security of the rates to be levied within the metropolitan water area; and in the event of the purchase to make provisions as to applying and distributing the purchase moneys and paying the debts and liabilities and undertakings acquired, for the dissolution of the companies and winding up their affairs, and as to the employment of and the duties to be performed by the existing officers and servants of the companies, "and for compensating such as may be deprived of any salary or emolument." The companies referred to as the metropolitan water companies are the New River, the East London, the Southwark and Vauxhall, the West Middlesex, the Lambeth, the Chelsea, the Grand Junction, and the Kent. Powers for insuring a proper supply and its effectual distribution are asked for, as well as the transfer to the authority of all powers of regulation or control, &c., in respect of the metropolitan water supply now vested in any public Board or authority. The Bill seeks to alter and enlarge the powers and provisions relating to the companies mentioned, and to repeal or alter certain other Acts specified.

CHIPS.

A memorial window, in memory of the late Mr. W. S. Dixon, is about to be placed in Alloway Church, near Ayr. The subject will be the Ascension, and the artists are Messrs. Kier, of Glasgow.

The foundation-stone of a Unitarian schoolroom was laid in Avondale-road, Peckham, on Wednesday week. A school and also a permanent chapel are to be built on the site, from the designs of Mr. H. C. Brace; the builders are Messrs. Watson and Co., of East Dulwich.

The church of St. Michael, Stockwell, S.W., is undergoing restoration, including the removal of the chancel from one end of the church to the other, re-pewing, the alteration of the position of the organ, and the taking down of a gallery. Messrs. M'Lachlan, of Clapham, are the contractors.

The ancient manor-house of Lydiard, near Swindon, was destroyed by fire on Sunday week. Workmen, in the employ of Messrs. Phillips and Powell, builders, were employed in the house up till 2 p.m. on the previous day, as two wings were being added to the house.

The Ely local board of health have received 24 applications for the appointment of surveyor, to which Mr. Harlock was only recently elected, under circumstances we commented upon at the time, and have reduced the number to four.

Building Intelligence.

Dundee.—The alterations and extensions of the Bank of Scotland premises in Dundee, being complete, the building has been reopened for business. The original bank was complicated in plan, and inefficiently lighted, and opportunity was taken in the alterations of extending the telling-room area by covering in an open court. The result has been a large symmetrically-arranged telling-room well lit, and with increased agent's and waiting-room accommodation. The south floor is partly devoted to spacious book and cash safes, with a stair and lift communicating. The agent's house, which occupies the upper floors of block, has been entirely remodelled; as a considerable part of its floors and walls are over a void space in the telling-room, wrought-iron beams, of large scantling, have been employed as means of support. These are partly sustained by granite shafts with stone carved caps and bases, which form an architectural feature in the room. The whole of the work has been carried out from the designs and under the superintendence of Mr. G. S. Aitken, architect, Dundee.

Durham.—The new post-office at Durham, erected from designs prepared by Mr. Jas. Williams, architect to H.M. Board of Works, is now completed. It is situate in Sadler-street, in close proximity to the Market-place. It is built in the Classic style of architecture, and is two stories in height, with a frontage of 36ft., while from front to rear it measures 80ft. The front is of Dunhouse stone up to first-floor level, and the remainder is of brick with stone dressings. The ground-floor contains public office with counter 30ft. long and sorting office 44ft. by 24ft. On the first-floor is the telegraph-department, stores, clerks, and letter-carriers' rooms, &c. The cost of the building has been about £3,500. The sole contractors for the works were Messrs Geo. Gradon and Son, of Durham.

Horton-in-Ribbesdale.—The parish-church of Horton has been reopened after restoration. In the north aisle, the windows, which were circular-headed sashes, have been replaced by others of fifteenth-century style, copied from those in the north aisle. The old roof to body of church, of the rudest construction, has been repaired and the lead relaid. The interior has been seated with benches of late character, open side-screens have been erected in the aisles, and in the absence of the usual arch, a low stone screen has been erected between chancel and nave. The east window has been filled with stained glass, as a memorial to the late Mr. John Foster; this portion of the work was executed by Messrs. Powell, and Co., of Leeds. Messrs. Hedley, of Bradford, were the architects; and Mr. William Dennison, of Normanton, was the contractor; the outlay on the restoration was about £1,100.

Manningham.—The new Church of St. Luke, Manningham, was consecrated last week. The style is 15th-century Gothic, and the plan consists of nave 76ft. long, 24ft. broad, and 40ft. high to ridge; north and south aisles each 11ft. broad, chancel 31ft. long, and of equal width and height with the nave; five small transepts or chapels, two to the north of the north aisle, three to the south of the south aisle, each 15ft. long, 11ft. broad, and 20ft. in height from the floor to the ridge, large organ-chamber in the north of the chancel, tower to the north of the organ-chamber, and vestry to the south of the chancel. Advantage has been taken of the considerable fall of the ground from west to east to provide two additional vestries in the basement. Accommodation is provided for 737 adults. The cost has amounted to about £4,000. The building has been erected from the designs and under the superintendence of Messrs. T. H. and F. Healey, of Bradford.

Metropolitan Board of Works.—The superintending architect announced, at the meeting of this board on Friday, the death of Mr. John Mullins, late district surveyor for Streatham, and Brixton. As a consequence of this it was ordered that the Vestry of Lambeth, in reply to their letter calling attention to the quality of the bricks used in the inner walls of buildings on the Elm Park Estate, Brixton Hill, be informed that the district surveyor to be hereafter appointed will be instructed to pay special attention in this case to the observance of the By-laws made by the Board under the provisions of the Metropolis Management and Building Acts Amendment Act, 1878. Drawings submitted by Mr. C. J. Phipps, on behalf of Mr. R. D'Oyly Carte, for the construction of a new theatre to be called the Beaufort Theatre, on a site on the west side of Beaufort Buildings, Strand, were approved. It was agreed to contribute one half the cost of widening the junction of Fulton-lane, and Battesea Park-road, from 40ft. to 70ft., and of the main road at Nine Elms, as proposed to be carried out by the Battersea District Board. The tender of Messrs. Nowell and Robson, the lowest of six received, was accepted at £2,575 for repairing and making up Coventry-street, Haymarket, as widened under the Streets Improvements Act.

Norwich.—The work of restoration at St. Peter Mancroft Church, the finest of the many churches in Norwich, is progressing satisfactorily under the supervision of the clerk of works, Mr. C. Ireland, and the architect, Mr. G. E. Street, R.A., has recently paid it a visit of inspection. With respect to the tower, the niches on the level of the clerestory, with their pediments and canopies, on the north and south façades, have just been completed, with the exception of a little of the carving, and the buttress at the south-eastern angle has been carried up to the height of the other work. The whole of the clerestory lights on the south side have been restored, and are nearly fit for the glazier. The workmen are now engaged on the two Renaissance octagonal turrets which flank the eastern front of the church, and face the Market-place. These having become decayed, are to be replaced by others more in accordance with the Perpendicular character of the church; that on the south side has been removed, and it is expected that both the new turrets will be completed before Christmas. The repairs to the magnificent roof of nave have been completed, except some of the carved wood for replacing finials, &c., seen to be past alteration, and the roof was found to be in a better state than was expected. The nave-roof has been releaded, and that over the north aisle is now being stripped, the timber being found to be in good condition. An effort is being made to raise funds, before the scaffolding is removed, for completing the upper part of the great square tower, which, although carried to a height of 98ft., was never finished, except in a temporary and slovenly manner, and it is unfortunate that no trace or suggestion is known to exist of the original design.

Oldham.—On Sunday last St. Anne's Roman Catholic school-chapel, erected in Airey-street, Oldham, was opened. The building consists of a schoolroom 60ft. by 30ft., 20ft. to the highest part of ceiling; a class-room 20ft. by 14ft., a chancel shut off by folding-doors, and a small vestry. Accommodation is provided for 260 children, and the total cost, including the usual offices, boundary-wall, gas and water-fitting, heating, &c., is not expected to exceed £3 per child. The buildings are plain but substantial. The large room is heated by one of Shorland's "Manchester stoves." The architect is Mr. Herbert E. Tijou, of Manchester, the contractors being Messrs. Charles Schofield and Co., Oldham.

Over Darwen.—A new Wesleyan school-chapel is now in course of erection at a cost of about £1,000. The walls externally are executed in coursed parpoint walling, with dressed quoins and mullions to window openings, from local quarries. The school-chapel is 56ft. by 30ft., with one class-room on each side 15ft. by 12ft., and 2 vestries behind same 15ft. by 12ft. Seating is provided for 400, the centre benches being fixtures, and the benches at each side reversible for class teaching. The class-rooms will be fitted up with patent revolving shutters, so as to disconnect them from chapel when required. The main roof will have framed principals of pitch-pine, varnished and ceiled to collar-beam, and will have perforated centre-pieces fixed between each principal for ventilation. The building throughout will be heated with hot-water apparatus fixed in heating-cell under vestries. The works are being carried out by local contractors, from the plans and under the superintendence of Messrs. Thackeray and Woods, of Darwen.

South Bank.—The foundation-stone of a new Wesleyan chapel at South Bank was laid last week. The buildings are to be in the Italian style, of brick. The scheme comprises the erection of chapel, Sunday-schools, vestries, and minister's house; but for the present the latter is in abeyance. The chapel is 44ft. wide, and 58ft. long on ground-floor, with an extreme length of 79ft. and will accommodate 720 adults at 20in. each. Hot-air stoves and Boyle's air-pump ventilation will be used. Mr. John Clark, of South Bank, is the contractor for the entire work; Mr. Job Sturdy, of Middlesbrough, clerk of the works; and the whole design has been prepared by Mr. F. R. N. Haswell, F.R.I.B.A., architect, of North Shields.

Stow.—On the 22nd ult., the old parish-church of Stow-cum-Quy, near Cambridge, was reopened after restoration under the direction of Mr. William White, F.S.A. The roof was found to be in an almost dangerous state; the ends of all the main timbers being completely rotten. These have been pieced without removal. If once removed, their replacement would have been impossible. The whole of the fittings are of oak. The chancel has been thoroughly restored, with a grant in aid from the Ecclesiastical Commissioners. Some interesting arches, carried on angels, have been opened out in the two side-walls; the one containing a window, the other forming a recess in which are remains of decorative colouring. A few remains of decorative colour have been discovered also on the walls of the nave. These have been preserved, though not sufficiently clear to be deciphered. The upper stage of the tower also has been rebuilt in stone and flint. This had been removed some eighty years ago and replaced with timber framing filled-in with brick, and a sham parapet. Some rather interesting parapets of brick, often found in the Eastern Counties, were necessarily removed from the clerestory, and could not be replaced.

Tonbridge, Kent.—Ferox Hall, the residence of Mr. T. A. Beeching, the banker, has been restored and considerably enlarged. It is an old red brick edifice of some architectural interest. A new wing, in character with the old building, has been added on the side towards the stables, and a new garden-front has also been built. The materials used are similar red brick as the old work consists of for the walling, and local sandstone for the dressings, whilst the roofs are covered by dark brown tiles. The carved woodwork in the rooms was done by Mr. Harry Hems, of Exeter. The exterior stone-carving is also by the same artist. Messrs. Benham and Sons, of Wigmore-street, have supplied the ranges in the kitchens. The contractors for the whole of the works were Messrs. George Punnett and Sons, of Tonbridge.

Wingfield.—The parish (formerly collegiate) church of Wingfield, near Bungay, was recently reopened, after restoration. It is Late Decorated and Perpendicular in style, and consists of a nave and chancel, with aisles extending on either side the whole length of the building. Some twelve or fourteen years since the chancel was restored by the Ecclesiastical Commissioners, and at that time the roof of the nave and of the north aisle were also restored. The south aisle has been almost entirely rebuilt and its roof releaded, and the north aisle has also been strengthened and repaired. The floor has been raised 3in. in height, and all the pews removed, those in the nave being replaced by oak benches having carved poppy-heads, and in the aisles plainer benches. For the bricks in passages have been substituted tile paving, in three colours. The three-decker pulpit has been restored, and placed upon a pedestal, and the paint has been removed from it and all other woodwork. A box-gallery has been removed from the tower-arch at the west end of church, and an oak screen now separates the belfry from the nave. The walls have been replastered and the stonework of arcades made good. Mr. R. M. Phipson, of Norwich and Ipswich, was the architect, and Mr. G. Grimwood, of Weybread, the contractor; all the carving and other work was executed by Suffolk men. The cost of the restoration has been £1,078.

Wolverhampton.—A pulpit, lectern, and stained-glass window have just been placed in St. Paul's Church, in memory of the late Rev. W. Dalton, B.D., its founder and first vicar. The pulpit is Perpendicular Gothic in style, of unstained oak, with winding stair and baluster of the same, and is 8ft. in height; the body is octagonal, having carved wood panels open in the upper portions; the book-rest and candelabra are of brass. The lectern is of polished oak, having canopied panels in the lower part. Mr. Veal, architect, designed the pulpit, which was constructed by Messrs. Cockerill, also of Wolverhampton. The window is a single light, on north side of organ, and has as its subject a full-length figure of the Apostle Paul, bearing the emblems of the sword and book. The stained-glass is by Mr. S. Evans, of West Smethwick.

York.—Plans and drawings have been prepared by Mr. J. Hall, of Canterbury, for a new church for [the parish of St Lawrence. The structure will be in the Early English style. The dimensions will be: nave, 111ft. long by 45ft. wide; chancel, 35ft. long by 23ft. 6in. wide. At the south side of the chancel will be situate the organ-gallery, and on the north side the vestry. There will be side aisles and a north and south transept. The main aisle will spring 40ft. from the floor to the top side of the pan, and from the pan to the ridge a further distance of 22ft. The side aisles will rise 20ft. 9in. from the floor to the pan, and from the pan to the ridge 10ft. The new edifice will accommodate 800, 650 sittings for adults and 150 sittings for children. The inside is to be of brick and plaster, except the chancel, which will be lined with ashlar. The floors will be laid with Staffordshire tiles. The roof will be open-timbered, covered with English boards, varnished. The cost of the church will be about £6,000.

CHIPS.

A small school for 40 children, with teacher's dwelling-house, has been erected by the School Board of Glenmuick and Tullich, N.B, at a cost of £340, from plans by Mr. A. E. Duguid, Ballater.

Plans have been approved for a new coffee-tavern, reading-room, &c., at Holme Head, Carlisle, chiefly for the use of Messrs. Ferguson Bros.' workpeople. Messrs. Hetherington and Oliver are the architects.

A new U. P. church has been opened at Perth. The architect is Mr. T. Lennox Watson, of Glasgow, whose design was selected in limited competition, Mr. Peddie, M.P., of Edinburgh, being the proessional referee.

The Church of St. Andrew, Buckland, near Dover, was opened on Tuesday. During the past four months, it has undergone enlargement from the designs of Mr. Butterfield, architect, Mr. Adcock, of Dover, being the builder. The nave has been extended westward for about 50ft., and provides 250 extra sittings. The work necessitated the removal of an old yew-tree, generally supposed to be 1,000 years old. This was successfully done last March, under the superintendence of Mr. Baron.

Conservative club-rooms are about to be opened at Brighouse, near Halifax. The building is being adapted from shops with dwellings over, and will include billiard-room, 34ft. by 30ft.; reading-room, 34ft. by 11ft., and smoke-room, 34ft. by 11ft. On the upper floor will be a second billiard-room, 27ft. by 22ft.; committee-room, 17ft. by 8ft., and several smaller rooms. Mr. Edwin Heaton, of Brighouse, prepared the plans, and is also carrying out the principal contract.

The corner-stone of the new church of St. Peter was laid at Keighley. Messrs. Booth, of Halifax, are the architects, and the cost is about £5,000.

The entrance to the dock at Whitehaven, which was destroyed in recent storms, is being reconstructed, the work being pushed forward to allow of the speedy re-opening of the dock. For the small stones and earth backing previously used, solid masonry granite blocks and concrete have been substituted in the new work. Messrs. Nelson and Co. are the contractors.

St. James's Church, Halifax, has been closed for re-pewing, and other works of restoration. Mr. Gaines has taken the contract for joinery, and Mr. Stafford that for plumbing.

A chancel just added to St. George's Episcopalian Church, Hardwicke-place, Dublin, was consecrated on Thursday week. It provides seats for 100 additional persons; the fittings are of oak, and the paving of marble, and at the east end is a stained-glass window. Mr. Fuller was the architect, and Mr. Curtis, of Abbey-street, Dublin, was the contractor; the cost has been £700. A memorial lectern, the work of Messrs. Hodgens and Sons, of Dublin, has also been placed in the church.

At a vestry meeting held at Ongar, Essex, it has been decided to call in an architect to inspect the parish-church, preparatory to a proposed restoration.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Ambition. (Your design was received and reviewed.)

Correspondence.

RAILWAY BRIDGES AND IRON STRUCTURES.

To the Editor of the Building News.

Sir,—Mr. Graham Lees, writing on the above subject in your paper of Nov. 19th, makes several statements with which I quite agree.

That many of our railway bridges have become too weak for the loads they now carry, is very certain, and we have been forcibly reminded of this fact pretty frequently during the last year or so, by the numerous failures of bridges which were built 25 or 30 years ago.

The causes of such disasters your correspondent refers to, and, I believe that from the same causes—deterioration of the materials used and greatly increased loads—many of our railway bridges are in a very shaky condition from the foundations upward.

Recently, however, a searching examination has been, or is being, made to ascertain their condition, and ensure their safety.

What Mr. Lees observes about the "ridiculously low contract" for painting bridges and roofs he had to execute, and the wretched work which naturally followed, notwithstanding careful supervision, might also be said of many architectural and engineering works carried out upon similar terms.

During my 30 years' experience of engineering in general, including railway and other bridges, and constructional ironwork for buildings, I have found that if work is to be well done, the contractor must have a reasonable profit, unless he happens to be one who would rather lose by his undertaking than turn out anything of inferior quality.

With *other* people, however, the "lowest tender" too often means such bad materials and wretched workmanship, that an admirably-designed structure may be rendered unsafe from the time it is finished.

In the case of buildings—girders of bad iron, carelessly riveted, improperly bedded on piers and columns; bolts in shear put any way through *punched* holes, and many other attendant and hidden evils, result.

I have seen machinery made by a first-class firm, at good prices, in excellent condition after 32 years' constant use, and I have also seen engines made by cheap and sloppy people worse than second-hand before they left the workshops.

The rage for cheapness and cutting down prices until a good contractor can hardly make any profit, is so much the order of the day, that until a more liberal spirit prevails, or better times reduce to some extent the striving and struggling for orders (if only to keep an establishment going), I am afraid the "lowest estimate" will often mean disgraceful work, involving extravagant outlay for repairs, if not disaster in some form or other, and serious loss.—I am, &c.,

J. W. C. Haldane, C.E.

15, Water-street, Liverpool, Nov. 27th.

Sir,—In the first place, Mr. W. G. Lees mentions that it is the *under* bridges which require the most attention, and he knows of hundreds of cases where the paint has been of such vile description that the first shower of rain washed it off. This is interesting, and it would be still more so to learn how rain can wash off paint from the underside of bridges. He next refers to the stupid ignorance of chairmen and directors for not taking his advice about a paint contract; I presume this said contract was to be executed to his specification, and when he has specified for a given quality and quantity, like a certain advertised household commodity, he "should see that he gets it," and if the contractors lose by it, it is their look-out and not his.

We are next treated to a few remarks upon steel rails; are set a little proportion sum, and then referred to a report of his, the subject and occasion of which we are left to imagine; but will Mr. Lees tell us where the leviathan locomotives he speaks about, as weighing 80 tons, are running?

The rolling load of bridges is next gone into, and we are told that the hundreds of bridges referred to were made 4¼ times the strength required for the greatest passing load; how he arrived at such accurate information about all the bridges he does not say, but one can't help admiring the odd quarter!

What does he mean by the "wear and tear" of a bridge? Oxidation we can understand; but how about the "elongation of the fibre"? What single bridge can he name where the iron has been strained beyond its limit of elasticity by the passing load? What does he mean by the "detachment of the grain"?

Supposing the rolling load to have increased, as he states, 100 per cent., how does he make out that the bridge has decreased in strength 50 per cent.? Has he forgotten the weight of the superstructure, and in getting this wonderful increase of 100 per cent., has he taken into account the respective lengths of the wheel-bases?

I would ask in what manner has Mr. Lees found difficulty in obtaining iron for bridges to stand more than 18 tons per square inch? I can name at least half-a-dozen firms who would be glad to supply, without extra cost, any amount of bridge-iron to stand 22 tons per square inch and upwards. Referring to the three-quarters of a cwt. of rust per square which he scraped off the Manchester floor, does he mean to infer that the weight of the ironwork was reduced by that amount?—I am, &c.

Hull, Nov. 30, 1880. John J. Webster.

BARRACKS.

Sir,—Kindly allow me space to say, with reference to Major Seddon's letter in your impression of Friday last:—

1st. That I was *most* careful to disclaim, *explicitly*, any personal connection with the subject of my paper.

2nd. That I was equally careful to give the whole credit of the designs, &c., to Major Seddon and his assistants.

The "Transactions," when published, will give the paper in full, and show how clearly the above points were brought out. Meanwhile, I am not responsible* for the incomplete newspaper reports of which Major Seddon (not unreasonably) complains. My connection with the subject of my lecture was a purely literary one.—I am, &c., E. Ingress Bell.

The Parade, Epsom, Nov. 28.

[* Nor are we.—Ed. B. N.]

THE FUTURE OF CEMENT.

Sir,—In respect of the leading article on this subject in the Building News of Nov. 26th, I beg to be permitted to state additional facts necessary to full justice being done to the subject.

Besides the red concrete exhibited by Mr. Lascelles, referred to in your article, there were also exhibited samples of red concrete made in 1867 (the bulk made at same time being now perfect in colour and quality after more than ten years' wear), and samples of a new treatment of cement and concrete work, which gives not only the colour of red bricks, but also every colour obtainable from every variety of brick, stone, marble, and granite—and that not as a surface colour merely, but as an evidence of the solid presence of the real material, the red of health instead of rouge-powder.

The samples of "mosaic" stone, marble and granite, exhibited, indicate a "use of cement" whereby all natural colours of aggregates, separately and in combination, are in the architect and artist's power for decorative construction—not as mere surface covering, but as exhibiting on its surface evidence of inherent beauty and strength.

It is *real* concrete, not imitating, nor attempting to be like, any other material whatever, but carrying *in* its face evidence of its solid self, and depending on itself entirely for beauty, as for all other good qualities now so readily accorded to good cement concrete.

Another point to recommend itself to the artist-architect: "mosaic stone" concrete, although moulded and cast, is easily carved; after being moulded to nearly the form desired, is as ready to yield to the artist's chisel as natural stones, and is not afterwards subject to the cruel fire, to twist the artist's lines awry, as terra-cotta is. And surely no æsthetic devotee is so insatiable of "hand-work" as to grudge the loss of rough hacking away of a third or a half of the bulk, as in carving stone and other materials.—I am, &c.,

1st December. Charles Drake.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—As there seems to be a perfect dead-look at present, under the circumstances so ably detailed by your correspondent "Vitruvius Caledonius" in your issue of the 10th September, will you allow me to suggest that Mr. Barry should be urged to make his award *on the question of merit only*, irrespective of cost? I have waited till now in the hope that someone might make a practical suggestion in the matter; but as no one has yet done so, I trust that you will insert these few lines.—I am, &c., A Competitor.

QUEEN ANNE EYESORES.

Sir,—Passing down the Chelsea Embankment, I notice, on a modern "Queen Anne" house, a clock presumably supported by a beautifully-designed wood bracket, but which, being evidently insufficient to perform its duty, is further strengthened by three plain iron rods fastened from brickwork. Would it not strike the most superficial of observers, Sir, that if such an instance *had* occurred in Queen Anne's reign or thereabouts that the 18th century smith would have lavished all his art and skill on the ironwork, and produced a thing of beauty, instead of the ugly eyesore that at present exists? Yet with all our advanced knowledge and experience of what has been done before, we are capable of producing such a result as I have described.—I am, &c., Lewin Sharp.

84, Cornwall-gardens,
Queen's-gate, S.W., Nov. 30.

CONSTRUCTIONAL IRONWORK.

Sir,—As a subscriber to your paper, it would afford me great pleasure if you could open your columns for a correspondence, by capable writers, on the subject of "Constructional Ironwork," such as the best ascertained section of girders for spanning window and door-openings, &c., &c., where they have great superior cumbent weight to carry; the methods of calculating strengths of same; and the best way of applying loads upon flanges, &c. Such a subject could be well extended, and would, I am sure, be a source of valuable instruction to your younger readers and myself. Trusting you will give us some valuable papers on this subject before long,—I am, &c.,

Edinburgh, 29th Nov. J. W. Morris.

CHIPS.

At a meeting of the shareholders of the Filey Harbour Company held last week, it was reported by the engineer, Mr. C. G. Clarke, that a provisional contract had been entered into with Messrs. Lake and Taylor, for the construction of the works.

The foundation-stones of a new Free Methodist chapel were laid at Glentworth, Lincolnshire, on Monday week. The chapel will seat 150 persons, and will cost a little over £430. Mr. Whitton, of Lincoln, is the architect, and Mr. Hobson, of Hogsthorpe, the contractor.

A four-light window in the north transept of the parish-church of Stow-on-the-Wold has just been restored as to its masonry, and filled with stained glass as a memorial to the late Major-General Raikes, C.B. The subjects are taken from the history of the conversion of Cornelius, as recorded in Acts x. Messrs. Wailes and Strong, of Newcastle-upon-Tyne, executed the work.

The Lancaster town-council last week accepted the resignation by Mr. John Hartley of the office of borough-surveyor, and voted him a gratuity of £150. Mr. Hartley has held the post for 11 years, and resigned to commence private practice in the town.

A new wing that has been added to the rural hospital at Tewkesbury was opened last week. It is Gothic in style, and is built of red bricks, with Bath dressings, with a timber-framed upper story. Mr. T. Collins, of Tewkesbury, was the contractor.

Mrs. Cubitt, the widow of the late Mr. William Cubitt, originator of the general contractor system of building, died on the 19th ult, at her residence at Denbies, near Dorking, aged 78. Her eldest son is the Right Hon. G. Cubitt, senior member for West Surrey.

A new Congregational church is about to be erected at Turnham-green, Chiswick, from the designs of Mr. T. Lewis Banks. Mr. Brunsden's tender has been accepted for the execution of the work at a little over £3,000.

Extensive additions and alterations have been in progress for some time at the workhouse at Lincoln, and last week a stage in the work was marked by the occupation of the new children's quarters. Messrs. Watkins and Scorer are the architects, and Messrs. H. S. and W. Close, of Lincoln, the contractors; the cost has been about £8,000.

The restored church of St. Mary at Kidlington was reopened by the Bishop of Oxford on Thursday week. The work done has been confined chiefly to the roofs of the nave and south aisle. The old roofs belonged to the Perpendicular period, and replaced roofs of the Early English time, which were taken off, and the nave side walls raised and the present clerestory windows inserted. The buttresses, however, on the outside, were not carried up at the same time, and hence the walls were left without sufficient support, and to this may be attributed the imperfect state of the roofs when the work of restoration was taken in hand. The sound old timbers of the nave have been reused in a conservative manner, but the aisle roof has been renewed on the former lines. Each roof has been re-covered with oak boarding and lead. The aisle wall has been rebuilt, and the tracery of the windows in the same restored. The work has been carried out by Messrs. Symm and Co., of Oxford, under the directions of the architect, Mr. W. Wilkinson, at a cost of £1,514.

A carillon, playing 14 tunes, in memory of the late town-clerk of Penzance, Mr. Edward Hearle, Rodd, has been placed in St. Mary's Church tower, Penzance, and was formally started on Sunday morning. It has been constructed by Messrs. Gillett and Blaud, of Croydon, at a cost of about £300.

Intercommunication.

QUESTIONS.

[6314.]—**Specifications for Houses, Shops, &c.**—I shall feel obliged if some fellow-reader will inform me where I can obtain a good specification book on houses, shops, &c., and also the name of author of such book.—J. C. B.

[6315.]—**Sections.**—I shall be glad to learn the proper method of measuring off quantities from sections where the horizontal scale is much less than the vertical—for instance, to measure drains thereon frequently varying in inclination.—T. L. P.

[6316.]—**Wood-Carving.**—Having to carve in wood four trusses representing morning, noon, evening, and night, I have chosen the cock crowing to represent the morning and the owl night. Would any of your kind readers suggest anything appropriate for noon and evening?—Young Wood-Carver.

[6317.]—**Value of Property.**—Will some experienced reader kindly give the name of a good work on the value of freehold and leasehold house property? Also the best current price-book for builder's materials?—Young Surveyor.

[6318.]—**Quantities.**—I prepared bills of quantities for tendering contractors by instructions of architect. A tender was accepted, and the contract signed, which was, however, afterwards cancelled at the request of the employer and with the consent of contractor, without consulting either the architect or quantity surveyor. Who should, therefore, pay for quantities?—Desideratum.

[6319.]—**Party-Wall.**—Will some reader be good enough to suggest some way of fixing wall plate to 9in. party-wall (in which there must be 4½in. of brickwork left in centre), and so as not to require a cornice which the corbelling shown in Fig. 1 would necessitate? Would the method shown in Fig. 2, in which A represents an iron flanged bearer for wood plate running the length of the wall answer? Would the iron have to be purpose made? If not, where could it be obtained? Is there any better way of accomplishing the object?—Wall Plate.

FIG. 1

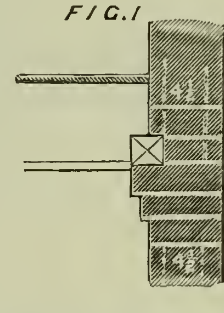
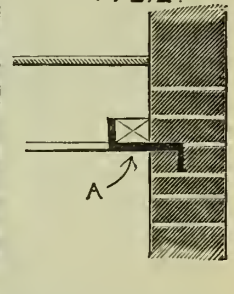


FIG. 2.



[6320.]—**Damp on Walls.**—In a church opened for worship this summer, now that the heating apparatus is in use, and when gas is lighted, the wet streams down all the walls from the top, but when fires or gas are not in use no indication of damp can be traced. The church is fairly ventilated. Some say the walls are sweating, and have not yet dried, and that when fairly seasoned it will disappear. Other opinions incline to the belief that the outer walling is not weatherproof, and is defective in construction. Externally, the walls are faced with hard parpoints, pointed in the joints. The soil is gravel and very dry, and damp-courses through all walls. Situation rather exposed. Building was roofed in before June last year, and plastered in autumn same year. No appearances of damp are to be found either on the glass or varnished wood or stone dressings, and only under under circumstances above named. Can any experienced correspondent give an explanation of cause, or say if likely to be permanent or temporary?—J. D.

[6321.]—**Sewage Systems.**—Has Capt. Liernur's pneumatic system for the collection and disposal of sewage been adopted in any town in England? If so, with what success? Is it successful in those places in which it has been adopted on the Continent? Any information with respect to this system of sewage-disposal would be esteemed. Can any correspondent describe the Rochdale system for the collection and disposal of fæces and dry refuse?—Coventry.

[6322.]—**Damp or What?**—I should be grateful to anyone who can help me to solve the following problem, and more grateful still to any gentleman who can suggest a remedy:—I took a house which had been vacant for some six months, and, of course, as is usual, put in a painter and decorator. We decided to have the drawing-room (about 14 × 15) distempered. The walls were stripped, cleaned, and prepared, and the first coat of distemper put on. This was found to "mottle" slightly, was sandpapered off, and a coat of thin paint put on the walls, as the painter tells me, "to form a body." Two coats of distemper, with the usual stencilling, finished the work. The room was unused for some time, but when used, shortly after lighting the gas, the walls began to get damp, and in a few hours were one "black mass," with small globules of water standing thereon, and in some places trickling down. Thinking the cause may have been damp walls, a fire was kept burning, as also five jets of gas, for a week. The walls got dry, the "damp" disappeared, and it was thought nothing more would be seen; but, unfortunately, it is otherwise. "Damp" appears within half an hour of lighting the gas, and gradually increases until, as above described, the walls are one "black mass." The house has a cemented front, with 14in. brick walls, and has been built some seven or eight years. On one side is an adjoining house, on the other the hall, and the fourth wall divides the room in question from the dining-room, also distempered, but on a paper instead of the bare plaster. This room is perfectly dry, and has never shown the slightest signs of "damp." I ought to mention that the work was done in August last, a good month for drying. Are the walls damp, or is it bad workmanship or materials? What is the cause, and what a cheap but effectual remedy?—A. F. H.

REPLIES.

[6296.]—**Damp Walls.**—The plaster probably was not in all parts thoroughly dry, and ordinary paint will not stand on damp plaster. Titanic paint will cure damp walls if not positively wet when put on. No damp will come through, and the appearance of the whole is uniform. A coat or two over the paint named would be a remedy.—Titan.

[6300.]—**Ventilation.**—Perfect ventilation can be secured by a system of introducing warm purified atmospheric air, at the same time removing all vitiated air, changing the air each half-hour, making the room equally warm in every part, and no cold draughts. Such a system is in use, but I cannot give details without intruding somewhat on the advertisement columns.—Carbon.

[6305.]—**Dip-Traps.**—"S. H." at page 633, asks:—"Are dip-traps good means for trapping drains?" What does he mean by "dip-traps"? If he means any form of water trap with a "tongue" or dipper projecting down one inch or more into the water, then we may reply that dip traps are good means for trapping drains. There are traps and traps, good and bad traps, however. The trap which does its work satisfactorily with only about two gallons of water may be termed good in that respect; but the traps which hold twenty, fifty, or more gallons are bad, and are then cesspools. It is easy renewing the water in the former, but difficult in the latter. Another good point in a water-trap is that it should be self-cleansing as regards its water surface upon the house side of the trap. This is a special point in "Buchan's" trap for drains. Nowadays traps on drains are generally ventilating traps, and they should be so made as that, by looking down the ventilating opening of the trap, the water in the trap can be seen, and the trap itself cleaned out if necessary with a ladle.—Progress.

[6305.]—**Dip-Traps.**—Dip-traps are effectual in trapping drains, providing they are properly constructed. The dip or seal should be of sufficient depth to resist the pressure of sewer gas, which, when the main sewers become fully charged, is compressed, and if there is insufficient means of ventilation, the foul gas is passed through the traps and into our houses. The seal should dip at least 6in. into water. If less, it would prove useless when subjected to a severe pressure, as is often the case after heavy rains.—Alfaed B. Brady.

[6306.]—**Breaking Weight of Cast-Iron Columns.**—The breaking weight of a cast-iron column, 4½in. diameter (outside), 12ft. 8in. long, 1 3-16 metal, is 80 tons, safe load, say, 8 tons.—Alfred B. Baady.

[6307.]—**Compass Point.**—The average variation of the needle has been gradually diminishing, and for all practical purposes for some time to come may be taken at 21° west of N. The diurnal variation has been observed to amount nearly to ½ of a degree, but the usual variation is somewhat less than 15 minutes. If "D. E." wishes to test this for himself, it is obtained thus:—Take Liverpool for example. On Dec. 4 the sun's centre will cross the meridian of Greenwich at 11h. 50m. 32s. As all Liverpool clocks mark Greenwich time, add difference between Liverpool and Greenwich time 11m. 53s. Greenwich time sun's centre will cross meridian of Liverpool, Dec. 4, 1880, 12h. 2m. 25s. If, then, at Liverpool, at 2m. 25s., after noon (Greenwich time) on 4th Dec., 1880, the angle which the needle makes with the meridian be measured it will be found to be about 21°, and this will give the centre line of transepts. Of course, every town will need a separate calculation for every day in the year. If "D. E." wishes to try this I shall be glad to give him the figures for any day in the year at any of the large towns in England.—W. G.

[6312.]—**Wood Beam.**—A good means of strengthening a wood beam would be to truss it with a wrought-iron rod, say, 1¼in. diameter, which could be easily done without much inconvenience. If the ends of the beam are embedded in brickwork they would have to be laid bare, so as to afford access for tightening up the rod. I would suggest that the rod be in one length, and parallel with the beam at a depth of 12in. from the underside for a length of 4ft. 6in., and then canted up and brought through the beam at each end at a point 3½in. from the top, where there should be a cast-iron plate with a boss cast on, at right angles with the direction of the rod. Each end of the rod for about 6in. in length should be 1½in. diameter, with a V-thread worked on and hardened, and should have a wrought-iron washer, 4in. diameter by ¾in. thick, and a hexagon nut 2in. deep. At each point of deviation from the horizontal the rod should bear against a cast-iron strut of ⅝in. metal, which should be secured to the underside of the beam by four ⅝ screws, 5in. long. If "Qua" would let me know the weight the beam would be ultimately required to bear safely, I would give him the exact diameter of the rod required, which might be less than I have stated.—Alfred B. Brady.

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An inquiry was held at Ramsgate on Tuesday week, before Mr. Arnold Taylor, as to an application from the improvement commissioners for the sanction of the Local Government Board to the borrowing of £52,411 for the following purposes: Street improvements, estimated to cost £22,454; gasworks, £20,000; waterworks, £6,000; wood-paving, £2,775; and removal of barriers, £1,182. Mr. Barley, the surveyor to the commissioners, explained the proposals, and stated that the authority wished now to add £5,887 5s. to the sum to be borrowed for permanent works.

A stained-glass window has been placed in the south aisle of Plympton St. Maurice parish-church, as a memorial to Mr. C. R. Buller. It was executed by Mr. Charles Drake, of Exeter.

STATUES, MEMORIALS, &c.

Taunton.—A memorial bust of Charles Summers, the Somersetshire sculptor, was unveiled in the Shirehall at Taunton, on Friday last. It is from the the studio of Miss Margaret Thomas. Charles Summers was born at Charlton, near Ilchester, in 1827, and for some years worked as a journeyman stonemason with his father, at Weston-super-Mare and elsewhere. After a time he found employment in the stoneyard of the late Professor Henry Weekes, R.A., and subsequently became a student of the Royal Academy. In 1852 Summers went to Victoria, and was appointed as the first president of the Victorian Academy of Fine Arts. He designed, and executed in bronze, a colossal memorial of the Bourke and Wills expedition, for which the city of Melbourne paid him £4,000, and in 1876 he received a commission for four colossal statues in marble of the Queen, the Prince Consort, and the Prince and Princess of Wales for the same city. This was his last great work, and he died at Paris in 1878.

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WATER SUPPLY AND SANITARY MATTERS.

Devonport.—The works for the interception and removal of the sewage of Devonport from Stonehouse-lake are approaching completion. The sewer has been completed from its highest point, near the rectory at Stoke, to the commencement of the tunnel in Durnford-street, with the exception of the special iron construction at Millbridge, and a short section in Edgcombe-street. The tunnel portion of the sewer is 3,390ft. in length, of which less than 80ft. remains to be driven. Four out of the seven outfall-pipes at Eastern King have been laid, and the Richmond-walk sewer is nearly completed. The experience of Sir Joseph Bazalgette, the engineer, in driving the sewer tunnel through Torquay, where hard solid rock was encountered the whole way, led him to anticipate similar ground at Stonehouse. It has proved most variable, however, the hard limestone of the entrance in a few feet showing fissures which admit the sea freely; and there have since been pierced stiff "shellet" with boulders, loose rock with clay joints, soft shellet, marl, and slate. The result is, that it has been found necessary to line the tunnel, at an additional cost to the estimates of £5,000; and the work, which should have been completed by the end of this year, will be delayed by at least four months. Mr. Henry Stevens is the contractor.

Peterborough.—Sewerage works have just been completed for the Corporation of Peterborough. They involved the construction of 13 miles of brick and pipe sewers; the erection of duplicate tanks for the straining of the sewage at the outfall, and 2 miles of concrete carrier; the preparation of 96 acres of land out of a farm of 300 acres purchased by the Corporation for the utilisation of the sewage by irrigation; the erection of two pumping-stations, with the necessary machinery; and the erection of two cottages. The sewage from all parts of the borough is conveyed and discharged at one outfall, by the water-carriage method on the separate system. As about seven-eighths of the population of the borough dwell on the north side of the River Nene, it is in this portion that the largest and most costly sewers are constructed; but the peculiar situation of the southern district has rendered the conveyance of the sewage to an outfall a matter of difficulty. The borough on the south side of the river is drained by 3¼ miles of stoneware pipe-sewers, and the sewage is brought to the river-side, whence it is carried in an iron pipe-sewer under the river and across the Washlands. After passing under the protection-bank of the north level it is emptied into a tank-sewer, devised for the reception of the sewage during the time the pumping-engines are at rest. It then flows into the wells of the southern outfall pumping-station, and is pumped into the gravitation-main, close to the outfall. The north side of the river is drained by 9¾ miles of brick and pipe sewers. The northern arterial main is a brick sewer, egg-shaped in section, of 3ft. by 2ft. internal diameters, and 3,670 yards long. The main intercepting brick sewer is 1,235 yards long, and comprises 149 yards of 3ft. by 2ft., egg-shaped; 612 yards of 2ft. 9in. by 1ft. 10in., egg-shaped; and 474 yards of 2ft. barrel sewers. These sewers discharge into a barrel culvert, 3ft. 4in. in diameter, and 508 yards long, which enters into a penstock chamber; from thence the sewage is taken by two 24in. iron pipes, laid side by side, and for the most part in embankment, to the straining-tanks at the outfall. The sewage from the districts north of the river flows directly on to the irrigation area by gravitation. The sewage, on arriving at the outfall, is discharged into the settling-tanks, built in duplicate, and provided with wrought-iron strainers; passing from thence the liquid sewage is conveyed in a concrete carrier to the land prepared for irrigation. On arriving at the land prepared for the reception of the sewage, the carrier divides into two smaller ones, from which the sewage is distributed over the irrigation area by land carriers. The larger concrete carrier is 1,098 yards in length, and has a water-way of 6·5 superficial feet. The two smaller carriers are 2,159 yards long, and have a sectional area of 4·8 superficial feet. The irrigation channels are 12in. wide at the top, 6in. at the bottom, and are 6in. deep. All the carriers are laid in horizontal lengths, with sluices and drops at every change of level. The soil on the irrigation area is of a light alluvial character, overlying silt, and has a natural filtration and drainage of 4ft. As the farm is situated near the Bedford level, the effluent water, except in dry seasons, must consequently be lifted over the north bank into the new cut of the River Nene. This is effected by two 12in. centrifugal pumps, driven by two 25 horse-power high-pressure condensing-engines. Each pump, when making 400 revolutions per minute, will deliver over the bank one million six hundred thousand gallons in six hours. The works were designed and carried out by Mr. John Addy, A.M.Inst.C.E., of Peterborough, with Mr. John C. Gill, A.M.Inst.C.E., as resident engineer. The contractors for the buildings were Messrs. S. and W, Pattinson, of Ruskington, near Sleaford; and for the engines, pumps, boilers, and machinery. Messrs. Seekings and Ellery, of Gloucester. The works on the main drainage and irrigation farm were partly executed by Messrs. J. S. Cooke and Co., and partly by the Corporation.

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LEGAL INTELLIGENCE.

Arbitration Case at Lancaster.—A long case of arbitration between Mr. H. Garnett and the Lancaster Corporation, which has been in hearing at the Institution of Surveyors at Westminster for more than twelve months past, was closed last week by both sides, but the arbitrator, Mr. Gully, Q.C., has yet to make his award. The corporation seek, under a special Act, to obtain an easement over Mr. Garnett's moorland at Abbeystead Fell and Lee Fell for the purposes of obtaining a water supply, the easement to be 7,192yds. in length, and 7ft. wide, or a total of 3a. 3r. 7p. The damages to shooting &c., were estimated by Mr. Garnett's witnesses as follows: Mr. Garnett claimed £30,000, Mr. Matthews considered £29,700 a sufficient sum, Mr. Straker £23,274, Mr. Story also £23,274, Mr. Farrar £16,035, and Mr. Jackson £16,035. On the other hand, the valuers for the corporation estimated the compensation due to be: Mr. Gow £1,401 9s. 2d., Mr. J. Dent £1,592 1s. 8d., Mr. Addie £729 3s. 4d., Mr. Fenwick £1,093 15s., Mr. Newton £875, and Mr. Drewry £1,743 15s.

Breach of By-Laws.—Last week several builders and owners were summoned by the Lanchester rural sanitary authority for infringing their by-laws. Thomas R. Dolphin was charged with having built a house at Templetown, in which the yard space was deficient 17ft. super., although an adequate space was shown upon the plan deposited with the authority. Defendant offered to have the buildings altered so as to comply with the by-law, and the magistrates having heard the case, as stated by Mr. Rounthwaite, sanitary inspector to the authority, permitted this course to be adopted, and ajourned the first case for a fortnight, but for the offence deviating from deposited plans fined him 20s. William Ridley, builder, Tow Law, was summoned—1st, for building certain new houses at Langley-park and neglecting to provide a damp-course beneath the lowest floor timbers of such buildings; 2nd, for proceeding to build such houses without giving two days' notice in writing; 3rd, for neglecting to provide block plan, &c., of a new house at Hedley-hill; and 4th, for not giving the necessary notice of his intention to proceed with the work. Mr. Rounthwaite said defendant had built a new house at Hedley-hill, and never submitted plans to the sanitary authority. For defendant it was pleaded that he commenced to build the house at Hedley-hill about eight years ago, when no by-laws were in force. The present building was merely a continuation of what had existed previously, and, therefore, he submitted that it did not come under the category of "new buildings." Mr. Rounthwaite said the foundations might have been put in eight years ago, but they were not visible four months ago, when he first saw the place. The case was adjourned for three months to give defendant time to put in the damp-course. In each of the other charges, a fine of 10s., including costs, was imposed. For neglecting to deposit a fresh plan with the authority after altering his intention to build, William Knox, of Mount Pleasant, was fined 10s., including costs.

Expenses of Removal of Dangerous Structure.—Debenham v. The Metropolitan Board.—This case, tried in the Queen's Bench Division on Wednesday, arose under an enactment, sec. 73 of the Metropolitan Building Act, under which the owner of any dangerous structure is liable to pay the expenses incurred in removing it, and a magistrate is to make an order on "the owner" for repayment of expenses so incurred. In this case the defendant was owner of a building deemed dangerous, and the Board had incurred an expense of about £55 in removing it. He was summoned before the magistrates for the expense, and objected that the Board had a contract with a builder to do all their work during a certain period, and that the contract prices were higher than at the time the work was done, and also that some of the walls of the building were party-walls, so that other persons would be part-owners, who ought to have been summoned. The magistrate thought otherwise, but stated a case. The Court, without hearing him, upheld the magistrate's order for repayment of the money. The appeal was, therefore, dismissed, and the magistrate's order upheld.

The Artisans' Dwellings Act.—Mr. Under Sheriff Burchell, at the Middlesex Sheriffs' Court on Wednesday week, presided over a special jury in the case of "The Metropolitan Board of Works v. Thurgood," which was an appeal from an award made by Mr. Rodwell, M.P., in respect of 12 small tenements in Commercial-place, Whitechapel, required under the Artisans' Dwellings Act. The houses were in a low neighbourhood and had been condemned. Mr. Meadows White, Q.C., and Mr. Freeman were for the Board of Works; Mr. Grantham, Q.C. (with whom was Mr. Poulter), for the defendant. The case occupied the Court to a late hour, and the evidence, as usual, was very conflicting as to the value of the property. The surveyors for the Board estimated the value at £1,250, and the surveyors on the other side put the value at £2,450. The amount of the award by Mr. Rodwell, M.P., was not allowed to be mentioned to the jury, and the Under-Sheriff, in summing up, said the case was of considerable importance, because if the verdict were less than the award Mr. Thurgood would have to bear the expenses, and he (Mr. Burchell) thought that, as a member of Parliament, the sooner Mr. Grantham got the law amended the better. The jury retired, and on their returne assessed the value at £1,900. The award was £2,100. Mr. Grantham said, as the verdict was less than the award, he had to ask, under the Act, for £20 as costs. The learned Under-Sheriff said he should certainly grant the application. A verdict for £1,900 was accordingly entered.

The Right to Lateral Support.—Brunken v. North.—In the Queen's Bench division, Dublin, last week, Mr. Baron Fitzgerald, and a special jury were engaged several days in hearing this case, which was an action brought by a jeweller to recover damages, laid at £7,200, for loss alleged to have been sustained by the plaintiff through the falling of his house in Grafton-street, Dublin, in consequence, as alleged, of the default of defendant in not having sufficiently protected the plaintiff's house during the pulling down of the house of the defendant. Evidence was given by an architect and others during the trial that plaintiff's house was in such a crumbling and decaying state that it could not long survive the slightest shock. On Friday, Mr. Baron Fitzgerald charged the jury, showing that the plaintiff had no legal right to support for his house from that of defendant. The law said that defendant had a right to remove his own house and rebuild it, but no right to do any act not reasonably necessary, by which injury would be done to the plaintiff; nor to do any necessary act in a manner injurious to the plaintiff, provided he could do it in some other way that would be less injurious. Besides this, there was, in this case, a special contract between the parties that the defendant would protect his walls from the acts of the defendant. This was differently interpreted, but he agreed with defendant's construction of it, that he would use reasonable and due skill and care to protect the plaintiff's walls from any injury during the pulling down and rebuilding of the next house. The defendant, having entered into that contract, left the conduct of the removal and rebuilding entirely to his builder, Mr. Meade, and his architect, Mr. Henderson, but omitted to apprise them of the additional obligation into which he had entered. As to the assessment of damages, the plaintiff was not entitled to an amount that would build him a new house, but to the value of the house as it was, and they must not take into account the loss of trade, profits, nor the rent. The jury, after two hours' consideration, found for plaintiff, damages £200, and his lordship granted judgment.

* * *

The annual meeting of the Glasgow Archæological Society was held on Monday in the new rooms of the Philosophical Society, Bath-street, when Professor Young, M.D., was elected president for 1881, and Professor Veitch, LL.D., Mr. Michael Connal, and Professor Lindsay, D.D., vice-presidents. Mr. St. John Day read a paper on "The First God of the Aryans," and Mr. Campbell Christie, of Hamilton, submitted notes on and exhibited urns containing human remains recently found near Hamilton.

Our Office Table.

It having recently been stated to the Council of the Royal Institute of British Architects that the charges made by quantity surveyors are sometimes shared by the architect, and such a practice, if it really exist, being open to great and obvious objection; the Council publicly declare that, for the future, such practice, if proved, will be deemed conduct which, in the opinion of the Council, is derogatory to the professional character of any Fellow or any Associate of the Institute.

The Court of the Worshipful Company of Glass-sellers are about to offer prizes of £50, £25, and £10 each for the best and most practical essay on the past and present position of the glass trade in all its branches, and suggestions for improvements in the English trade; and in order to make the competition as practical as possible, they will be obliged by any suggestion that may occur to those able to give them. The points on which they ask suggestions are, 1st. The nature and scope of the essay. 2nd. The names of gentlemen best adapted to act as arbitrators.

The Nunnery Colliery Company have succeeded in adapting an arrangement of the electric light to the whole of their establishment of screens at Sheffield. Last week the new method was tested. The light given is very satisfactory, and proves an effective substitute for daylight. The position of the two lamps is so arranged as to throw the light directly on the coals as they pass from the screens into the trucks below. The lights supplied emanate from two lamps which are fixed above the workmen, who thus do not suffer from the dazzling effect produced. The light being thrown down directly upon the screens, there is no chance of any dross or impurity escaping the eye of the screener. The lamps have each a light of 5,000 candles. They are Crickie lamps, the power being obtained by a small engine of five horse-power (indicated). The apparatus is very simple and, as will be seen above, very economical. The light is constant, and little attention is required. Mr. Sydney F. Walker, M.S.T.E., Telegraphic Engineer, of Nottingham, is the engineer and contractor for the work.

The company which has been founded for taking preliminary steps to ascertain whether a submarine tunnel can be made between Calais and Dover has at last succeeded in driving a shaft down to the depth at which the tunnel, if practicable, would have to be made. Although in the upper strata there was a good deal of water, there is no infiltration of it in the gallery, which is in the solid rock. A second shaft is about to be driven, and the directors of the company state that if no unforeseen obstacle arises the tunnel might be completed in four years. The real point of interest for the public is not whether the tunnel would be a good thing if it were built, or if it be possible to build it, but will it pay?

The Building Exhibition, Leeds, in April last, at the Agricultural Hall, is, we hear, to be repeated from April 4th to the 16th in the coming year. The main arrangement of the last exhibition will be adhered to in this, and the materials divided into the following sections:—1. Architectural.—Drawings, Plans, and Models. 2. Construction.—Bricks, Stone, Concrete, Wood, &c., and Sanitary Appliances in Pottery or Concrete. Constructive Ironwork. 3. Engineering.—Machinery and Engineering Appliances—Taps, Valves, Hot-water and Steam Heating stoves, &c., &c., and Metal Sanitary Appliances. 4. Decoration.—Wall-papers, Paints in Oil and Tempera, Window-glass Staining, Plaster and Papier Mâché Ornaments, Encaustic Tiles, &c., Marble and Terra-cotta, &c., and Carved Woodwork; and section 5. Furniture and Portable Decorative Articles, including Busts, Pottery, Metalwork, Turned Ornaments in Wood, Stone, or Metal, &c., &c. All communications, as heretofore, are to be addressed to Mr. John Black, 162 Strand, W.C.

In preparation for the early commencement of the Session of Parliament for 1881, a number of artificers have been set to work to hurry the completion of the alterations and improvements which have been in progress at the House of Commons during the past few weeks. Although in 1875 a large amount of money was expended in structural alterations and decoration of the offices, corridors, and rooms connected with the House, there has not been, for many years, such extensive work undertaken as during the present recess. The only structural alteration in the Commons' Chamber is that in connection with the Reporters' Gallery, to which, by trenching on the Members' Gallery at either side, additional seats for Reporters have been added. The pavement in the "Lobby" of the House, which has been subjected to more constant wear than the floors of any other portion of the House of Legislature, was overlooked in the renovation of 1875, but now the "Lobby" has had its floor covered with new tesselated pavement of mosaics, of the old pattern of crown and intertwined roses, shamrocks, and thistles. Seats similar to those in the House have also been provided for the accommodation of strangers. No structural alteration is being made in the House of Lords.

The second meeting of the Royal Scottish Society of Arts for the current session was held last week, Mr. Henry Cadell, President, in the chair. The first communication made was that by Mr. Alexander Frazer, M.A., optician, "On a Novel Form of Thermometer." The instrument, which was exhibited, was a combination of a balance and a thermometer. The thermometer acted as the beam of the balance, and at one end of the beam a graduated scale was placed. When the mercury expanded one end of the beam was rendered lighter, while the other end was depressed. Mr. Thomas Ivory, advocate, exhibited in operation a model of "An Improved Patent Air-Heating Apparatus," which, he explained, was constructed on the same principle as the Gill stove. The apparatus consisted of a great number of separate rods, crossed so as to give a large area of heating surface, while, being inclosed, they emitted only pure air, the produce of combustion from the gas beneath being carried off by a chimney.

CHIPS.

It was decided last week, by the committee, that the memorial to the late H. W. F. Bolckow, M.P., should take the form of a statue and pedestal, to be erected in the centre of Middlesbrough-on-Tees, and Mr. D. W. Stephenson, of Edinburgh, was appointed as the sculptor.

The trial-trip was made last week on a branch railway from Torrington station, on the South Western system to the Marland Clay Works. The line includes a bridge over the River Torridge, and a long viaduct. Mr. Fell was both the engineer and the contractor.

A stained-glass window has been placed at the west end of the north aisle of St. James's Church, Stonehaven, N.B. The subject is the Adoration of the Magi, and it was designed by Mr. R. A. Anderson, the architect of the church.

The foundation-stone of a Baptist lecture-hall was laid at Worthing on Tuesday week. It measures 30ft. by 35ft., and will be built of red bricks and flint, with Bath-stone dressings. The style is Early English, and the cost will be about £1,000. Messrs. Scott and Hyde, of Brighton, are the architects; and Messrs. Hide Brothers and Cook, of Worthing, are the builders.

A building to be used as a sailors' home, and also for housing the local Mercantile Marine Board, is in course of erection at Dundee. The architect is Mr. D. McLaren, of that town.

The River Wear Commissioners, last week, adopted a report for the improvement of the river, by the deepening of the lowest part of Sunderland Harbour by dredging, estimated to cost £11,210; the formation of a deep-water channel to Hylton, estimated at £25,000; straightening the channel at North Ferry, £12,000; and removal of rock at the entrance to Sunderland Harbour, £7,508. In all, the works, with the purchase of plant, are expected to cost £66,000, and they are to be carried out from the plans and under the supervision of Sir John Coode, C.E.

The directors of the Nottingham Waterworks Company have presented Mr. Thomas Hawkesley, F.R.S., with a testimonial in silver, in acknowledgment of 50 years' services to the company as engineer-in-chief, from its commencement in 1830 till its dissolution in the present year.

The local board of Burgess-hill, Sussex, on Thursday week elected, as surveyor, Mr. H. Ingram, of London, at a salary of £115 per annum.

CHIPS.

A small school, with mistress's house attached, has just been completed at Chettisham, Cambridgeshire, for the Rev. R. Winkfield. The works have been carried out by Messrs. David Porter and Son, builders, of Southery, near Downham, from the designs and under the superintendence of Mr. E. Swinfen Harris, architect, of 32, Craven-street, Strand, London, and Stony Stratford.

A stained-glass window has been placed in the chancel of St. Michael's Church, Lewes, as a memorial of the Doyle family. It is of two lights, and represents on the left the Angel and Mary at the Saviour's Tomb, and on the right-hand side are Christ and Mary in the Garden. A small quatrefoil above is occupied by the cross and crown. Messrs. Powell, of London, were the artists.

At a meeting of the Guildford town council last week, plans and specifications of the proposed new bridge and approach to the railway station were submitted by Mr. C. Sparkes, C.E., the surveyor to Earl Onslow, and were referred to the borough surveyor for examination and report.

The Dean and Chapter of Chichester have decided to remove a series of dirty canvas screens, by which the arches of the nave triforium in the cathedral have, for many, been blocked up. Before this can be done, however, it has been necessary to exclude rain and draughts, and, accordingly, Mr. Vick, builder, of that city, has taken a contract to repair the lean-to aisle roofs, which are covered with tiles, and also to ceil them. The southern side is now being repaired.

At a meeting recently held in one of the committee-rooms of Wolverhampton town hall, it was decided to form an association, the special object of which will be to provide members, at moderate cost, with advice and supervision in the sanitary arrangements of their dwellings. A provisional committee was appointed, and instructed to examine in detail the rules of the Edinburgh Sanitary Protection Association, with a view to their adoption, in whole or in part.

The annual meeting of the school of art at Swadlincote was held on Wednesday week. Mr. Cook, of Derby, the head-master, stated that the school had received more awards for the number of students, only 30, than any other school in England.

The forthcoming book on Decoration and Furniture for Domestic Buildings, by Mr. Robert W. Edis, F.S.A., will contain about thirty full-size photo-lithographic plates, from the original drawings of Mr. Maurice B. Adams, A.R.I.B.A., including one illustration by Mr. H. S. Marks, R.A.

The old Bridge Hall and other buildings near the bridge at Bideford, Devon, are about to be pulled down by the feofees, and replaced by a modern block of premises, covering an area of 61ft. by 56ft., and from 45ft. to 50ft. in height. This will contain on the ground-floor a public free library and a reading-room, with clerks' offices, on the first floor the new Bridge Hall, and over this a suite of offices. Mr. Bryden, of Bideford and Westward Ho! is the architect.

The Croydon local board of health decided last week to purchase 14 acres of land near and to the north of Norwood Junction-station of the ecclesiastical commissioners, at 600 an acre, to be maintained as a people's recreation ground for South Norwood.

A new church, dedicated to St. Mark, was opened in the Alexandra-road, Wimbledon, on Wednesday week. Mr. Maylard, of London, is the architect, and Mr. Manley the builder. The cost has been £1,200.

Mr. Arthur Hall, a well-known Somersetshire antiquary, has just died at his residence, near Chard, and by his will he leaves the whole of his valuable collection to the Corporation of Chard for forming a free library and museum, provided a building is erected within one year of his death.

It is proposed to fill a window in St. Margaret's Church, Westminster, with stained glass, at an estimated cost of £800, as a memorial to Caxton.

The French Permanent Commission of Statistics have determined on the publication of an *Annuaire de Statistique* of the city of Paris, which will contain official information regarding the population, topography, climatology, the financial situation, the schools, the hospitals, the cemeteries, the markets, the theatres, and the various municipal establishments of the capital.

The Fog and Smoke Committee met last week, when the chairman announced that they had arranged for a series of trials of fuel and apparatus at South Kensington, and appealed for the requisite funds. A deputation to the Lord Mayor was decided upon.

The Hanley school-board have accepted the tender of Mr. G. Ellis, of that town, for the erection of new schools for 1,000 children in Cannon-street. The cost will be under £5 16s. per head. Mr. W. A. Keates, of Hanley, is the architect.

It was decided, at a meeting on Wednesday, at Wolverhampton, of the Staffordshire Mines Drainage Commissioners, that the Bilston district must be amalgamated with Tipton for drainage purposes. Last year the Bilston owners succeeded in voting themselves out of the operations of the Act, and the result was that the water from the Bilston mines, owing to the pumping operations having practically ceased, flowed into the Tipton district and flooded the pits there to such an extent that it is estimated an expenditure of £35,000 will have to be incurred to drain the district before the immense area of coal now submerged can be got at. It is proposed to borrow the money required, and repay it by a rate of 6d. per ton on all minerals raised from the Bilston and Tipton mines.

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MEETINGS FOR THE ENSUING WEEK.

Monday.—Society of Engineers. F. W. Grierson on "The National Value of Cheap Patents." 7.30 p.m.
Society of Arts. 3rd Cantor Lecture, by Professor A. H. Church, on "Some Points of Contact between the Scientific and Artistic Aspects of Pottery and Porcelain." 8 p.m.
London Institution, Finsbury-circus. Leslie Stephen on "The Relation of Morality to Literature." 5 p.m.
Wednesday.—Society of Arts. Dr. A. Carpenter on "London Fogs." 8 p.m.
Thursday.—St. Paul's Ecclesiological Society. Conversazione in galleries of Society of British Artists, Suffolk-street, Pall-mall.
London Institution. Dr. L. S. Beale, F.R.S., on "The Germination and Propagation of Disease." 7 p.m.

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TENDERS.

*** Correspondents would in all cases oblige by giving he addresses of the parties tendering—at any rate, of the accepted tender—it adds to the value of the information.

Barton.—For laying main drains and making embankments on the sewage farm at Hixton, for the Barton rural sanitary authority. Mr. John Price, A.M.I.C.E. Quantities supplied by the engineer:—

Worthington, W. H., Manchester	£459	0	0
Jackson, J., Walkden	260	0	0
Marsland, J, Manchester	251	17	8
Rayner, G. G., Liverpool	213	14	0
Claridge, T., Stockport	212	14	2
Harrison, W., Salford	187	16	9
Turner, R. and Son, Warrington*	183	3	6

*Accepted. Engineer's estimate, £185.

Bridgwater.—For laying on a water supply and refixing soil-pipes at the workhouse, for the Bridgwater board of guardians:—

Willis (accepted)	£274	19	0

Brighton.—For re-forming roadway on the Highcroft Estate. Messrs. Holford and Clayton, architects, Brighton:—

Lodder and Homewood	£315	0	0
Marshall...	210	0	0
Nurcombe	199	0	0
Oliver, Preston...	175	0	0

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THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 10, 1880.

STONE IN CONSTRUCTION.

BUILDING stones of good repute may be conveniently classified into a limited group of Silicious, Calcareous, Magnesian, and Granitic, obtainable from a variety of well-known and clearly defined geological formations. In London we can find, in most profuse abundance, many examples of the best selected sorts, from the present condition of which we can with much advantage study their several peculiarities, and form some judgments of their suitability for construction in impure or abnormal atmospheres.

Stone does not now occupy so prominent a position as formerly, for many of the duties which it previously performed are delegated to bricks, iron, and timber, so that in a great measure its use is confined to ornamental rather than structural application. Indeed, stone, more especially as applied in the buildings of the metropolis, may be regarded as a thin plating or veneering to the carcase composed of bricks and concrete in combination with iron. Hence the diminished necessity for the mason's art or the (strictly-speaking) mathematical efforts of the architect. The strains and pressures of the arch, which were so frequently the principal elements in ancient architecture, are borne by a much easier and less elaborate system of iron-work arrangement, which is, however, unobtrusive in character, being hidden by various devices to prevent its being seen.

Stone, occupying such a comparatively subordinate place as that of ornament, is subject, however, from its exposed position, to the damaging influences of climate and atmosphere. The quality of the stone, therefore, is a matter of the greatest importance to the modern architect, because, through its agency he gives expression to his artistic ideas, and in fact is entirely dependent on its colour, texture, and other properties for their successful permanency. When we speak, therefore, of the decay of the Houses of Parliament, we mean that its external surface, pinnacles, and other elaborate ornate parts, are in an incipient state of disintegration which must ultimately result in their entire destruction. This incessant process, hitherto unchecked, is analogous to that of iron oxidation, which from air and moisture ultimately, if unguarded, succumbs to the destructive natural agency against whose baneful influences it is unable to contend. It is only, however, the clothing as it were of the gorgeous Palace of Westminster that is suffering, for the main ingredients of the fabric itself will, under any damaging external influences, prove competent to maintain the nation's assembly-house; for although not founded on a rock, its artificial foundations are of the most permanent character.

The decay of the granite of which the noble structure of Waterloo Bridge is built is surrounded with more cause for regret inasmuch as the rapid and too visible decay of its parts denotes that it is only a question of time when the whole building must succumb to the destructive agency with which it is incessantly assailed. The dissolving action of moisture in this case degrades the cementing agent by which the granite is held together, and unless it be made externally waterproof, the bridge is doomed to destruction; for all its noble parts and proportion depend on the integrity of the constructive agent by which it is built up. A good (or rather a bad) example of this kind of granite waste or decay might have been seen but recently in the bridge over the Liffey in Dublin, built by Semple, about 100 years ago, where the balusters of the parapets had become so attenuated as to have nearly lost all trace of their original form. The granite used in this bridge was from Wicklow; that employed in the construction of Waterloo Bridge being mainly from Cornwall, while the parapet and its balusters are built of grey granite from Aberdeen.

St. Paul's Cathedral, built of Portland Stone from the Oolitic series of limestone, maintains, except at its west and south-west extremities, a tolerably fair and undamaged face. The decay or defacement in this grand specimen of substantial architecture is caused mainly by the action of atmospheric moisture, the carbonic acid of which dissolves out the carbonate of lime slowly, and in certain aspects softens the original tooled lines of the mason. Another source of degradation is due to the deposit of chemical impurities on its more ornate surfaces, which, under certain atmospheric conditions, become actively destructive. Whatever damage such a cause creates may be considered due to the negligence or apathy of the clerical authorities to whom is delegated the duty of protecting the structural integrity of the Metropolitan Cathedral.

These three examples of different stones from various geological formations show the difference of values which they represent in constructive art under the trying conditions of a London atmosphere; although under any circumstances the inherent causes of decay would sooner or later have become developed in any situation. There are no sufficiently important examples in London or its neighbourhood of silicious or freestone construction to point at, owing in a great measure to the cost of conveyance from the distant sources of such supplies preventing its use. In Edinburgh, however, the buildings in which Craigleith stone has been used prove that this nearly pure silicious stone is well suited for building purposes. Glasgow also is well circumstanced with regard to freestone, and the best examples in that city are the Cathedral and the new University. The recent completion of Cologne Cathedral recalls the fact that this great and beautiful building, whose slow progress during more than six centuries must have been damaging to the stone of which it is built, must be most durable in character. This cathedral is chiefly constructed of stone obtained from the Bunter sandstone formation, quarried in the Black Forest. It is fine-grained, very durable, and its particles cemented by a silicious paste.

In none of those important and well known buildings which we have referred to is to be found any settlement or disturbance from defective support, and the stones of which they are built have proved competent to resist all pressure from whatever source. The design of the architect for the Houses of Parliament may be regarded as the best of its kind, and in the great care taken to procure the best quality of stone, ample precaution was taken in the task of exploration and examination which preceded its selection. Under what circumstances, therefore, are we to account for the great mistake which occurred? The most experienced as well as scientific authorities expended their knowledge, and every apparent safeguard was forthcoming to insure success. The stone selected was of compound chemical constitution, and approached the desired proportions of a dolomite which, when the carbonates of which it is composed are well and truly balanced, denotes permanency of structure and durability of a high order. Such at least was the deliberate verdict of the celebrated commission appointed under the most favourable conditions, and who based their report on chemical tests and the fact that the stone was apparently indestructible in the locality of its origin.

Until 1839 the magnesian limestones were not much known beyond the counties of Derby and York, where for centuries they had been used for local purposes. The stone selected for the Houses of Parliament was of a pleasing light yellowish brown colour, having a pearl-like lustre, and where fractured displaying a semi-crystalline structure. Its chemical ingredients were carbonate of lime 51 per cent., 40 per cent. of carbonate of magnesium, and upwards of 3½ per cent. of silica. Its specific gravity was 2,316, being higher than any other limestone, while its cohesive resistance was four times greater than that of Portland stone. Under the sulphate of soda, or "Braid's test," it suffered but trifling disintegration. This magnesian limestone, therefore, appeared, from the most careful examination, to possess every requisite, and to fulfil all the conditions required of it. Good colour, fine texture, high cohesive capacity, a minimum degradation, resulting from an onerous test, and durability in an unvitiated atmosphere. What more could the most careful architect do under the circumstances? Nothing! And yet to build in London with such stone, would be, after our experience, simple stupidity. The real and true cause of the decay is primarily due to the complex chemical constitution of this particular magnesian limestone, which could not withstand the degrading influences of a vitiated atmosphere, in which considerable quantities of sulphur and some of its deleterious compounds existed. Although not a very porous stone, it has sufficient capacity to absorb in a moist condition the damaging atmospheric impurities which are in a manner conserved and ever-ready, under favourable circumstances, to display their detrimental influences. In all probability also much of the damage is consequent on the hurried quarrying of the stone to meet the requirements of so large a work as that of the Houses of Parliament. The stone in those buildings in the locality of the deposit was doubtlessly carefully selected and allowed to remain for some time to season before being placed in position. Nearly all stones improve by such treatment, and with many of the softer qualities it is considered improper to use them until after the quarry "sweat" has gone, or rather exerted its beneficial influence in closing up the surface pores of the stone by its quasi-crystallisation. The greatest amount of waste or decay in the stone at Westminster occurs in the more ornamental parts of the structure, owing in all probability to the damaging influence of the mason's tool, which in working out the details left exposed angles and curves cutting the laminæ of the stone in all directions, so that ready access was afforded to the destructive agent.

The experience gained from this costly experiment should be well studied by constructors generally, and the architect should consider the possibility of substituting flat ornament for that of a more florid character. The waste of stone in all public buildings, from whatever source, is more particularly apparent in projecting ornament, where the drip is detained and allowed ample time for insidious absorption or penetration. In the case of laminated stones, the damaging influence from frost is more intense where the exposed vertical or angular section of the ornament admits of the free access of water, which after being frozen exerts its mechanical disturbance when a thaw takes place.

The variety of cementing paste in the different stone formations renders it necessary to carefully analyse their values before deciding on using them under any circumstances whatever. The sulphate of soda test, when performed under careful conditions, is useful; but it is only competent to prove the value of the stone under examination to resist the ordinary wear of normal atmosphere, and cannot therefore be considered as a reliable guide where deleterious chemical influences are to be contended with. To prove, therefore, what binding influence the matrice exerts on its associated aggregates, it would be requisite to subject it to a corresponding artificial atmosphere of its intended site. The binding agent is most susceptible of degradation, and all building stones, of whatever kind, derive their constructive value from its good or bad agency, and its capacity of resisting weather or atmospheric influences of every kind. Our primary knowledge of the durability of stones is derived from their behaviour in situ, or when built in walls and other imperfect structures in the locality of their derivation. The millstone grit gives undoubtedly the best results from such examination, and the worst may be regarded as that resulting from an inspection of the materials from the new red sandstones. Surface stone which has for ages resisted atmospheric wear is well adapted for building purposes, where its texture admits of economical conversion. Old buildings may be supposed to have been built of stones so weathered and matured, and therefore the results derived from their examination are favourable. Such observation, however, indicates that a rock which may be for all practical purposes highly suitable near the top or surface is less competent to resist exposure when quarried at a depth from the surface.

The more minute the particles of the stone, the closer the texture, in consequence of their smallness, securing a perfect coating of the cementing paste. If the aggregate is composed of clean quartzose particles, and bound together with a pure silicious paste, we find the most durable stone, capable of withstanding all the vicissitudes of climate. The mountain or carboniferous limestone in its purest form is hard and difficult to work, and, except in what may be termed its encrinital and other marble deposits or strata, ill adapted for house-building purposes. When used for engineering works, and subject to the trying winter climate of mountainous districts, considerable degradation arises, more especially in Derbyshire and Yorkshire, where the condition of many railway bridges indicates that the carbonate of lime is being gradually dissolved and washed out from its surfaces. This limestone may be regarded as a practically pure carbonate, and its cementing paste, of course, calcareous; its texture crystalline and easily fractured, and where found in an impure state (except in the marble deposits) with oxide of iron in its analysis, subject to fracture as well as surface decomposition. Granites are so irregular in mineralogical value as to surround their use with more or less danger; but experience, as far as can be relied upon, indicates that those with the least amount of alkaline analysis stand best. The qualities of this hard rock are manifold, and chemical estimation, however accurate, cannot be depended upon as a guide in their selection, owing to their irregularity of original deposition. In fact, all rocks of whatever kind, whether derived from sedimentary or igneous sources, are variable in their chemical constituents; but the builder should give preference to those having pure quartz as its base with a silicious paste.

The question of durability of rocks has, during recent times, been much assisted by the consideration given to the preparation of concrete in which Portland cement is the binding agent. The gradual increase of constructive value which arises from a careful selection of aggregate and studious adherence to the use of a high-class cement indicates that the faults of natural stones are consequent on defective proportions and imperfect binding agents. Indeed, future attention should be given, in the selection of building stones, to the quality of their constituent cement paste, and no stones should be tolerated, however pleasing their colour or texture may be, that do not possess the inherent and indispensable property of permanent cohesion. Compressive transverse and tensile strength is, under certain circumstances, of considerable value in the assessment of stones having established reputations; but they fail to guide with safety when the stone is from some hitherto unknown and untried source. In all cases where mechanical tests are resorted to, the results are derived from fresh samples of the stones recently quarried, and still untainted with the damaging surroundings of its future position. It is well known that some qualities of the soft stone obtained from certain oolitic strata become indurated by exposure; but it is not always found that such beneficial results follow where they are placed in localities where impure atmospheres prevail.

In English climates, or others equally charged with moisture, it is apparent that granite and limestone, if not many others of our building stones, become in a comparatively short time endamaged by injurious chemical action, and in the not distant future the question must be asked, What shall we do to put a stop to this waste? Much attention has already been given to this momentous question, but hitherto the hosts of remedies have followed, and not preceded, the use of the stone, and failed to remedy the evil. If the stone is to be preserved, it must be dealt with before it enters the damaging atmosphere, and there would not be much difficulty in preparing the work at the quarry, and thus secure its being proof against the most insidious attacks of the destructive locality in which it is to be placed. Painting granite and other building stones seems a dreadful remedy, but their surface must be preserved; the protective agent should be transparent, with considerable penetrative capacity, so as to occupy the surface pores of the stone and prevent the entrance of external moisture. The quality of such a preservative will have to be unexceptionable and free from any chemical ingredients likely to aggravate the dangers which their application is intended to avert. Nature, in many well-known instances, has preserved some relics of ancient architecture with a coating of lichen which, in their protective capacity, have maintained the original lines of the sculptor, while those portions of the same building exposed to atmospheric influences have lost all trace of their original form and character.

The mineralogist, guided by the chemistry of this important stone question will, in the future, when petrology or the study of the rocks becomes an established branch of geological science, clear up much of the present mystery, and, by the aid of microscope and blow-pipe, be enabled readily to estimate the amount of degradation to which building stones are liable under certain abnormal conditions. Modern civilisation has developed new types of disease in the human body, as well as creating in the densely populated centres a condition of atmosphere of such a character as to establish certain endamaging influences on stones which hitherto were regarded as weather-proof and competent to resist the most insidious attacks from every quarter.

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THE WATER-COLOUR EXHIBITIONS.

THE winter exhibitions of water-colour drawings open favourably with the collections in Pall Mall. The Society of Painters in Water-Colours, 5, Pall Mall, East, show a number of sketches and studies of remarkable merit, and not a few of much power. In landscapes the gallery is very rich. It would be scarcely doing justice to refer to the works under the titles of the artists, though we may say that the sketches and studies of Herbert M. Marshall, S. P. Jackson, R. Thorne Waite, T. Danby, C. Davidson, Oswald Brierly, E. A. Goodall, Alfred Fripp, T. J. Watson, Tom Lloyd, W. E. Lockhart, W. M. Hale, G. Fripp, W. Callow, Birket Foster, H. P. Riviere, Clara Montalba, G. Dodgson, Brewtnall, S. Read, and Paul Naftel are equal to the reputation of those masters, and exhibit some of the highest qualities of landscape painting. We might take, for example, the solid colouring of T. J. Watson, as shown in his "In a Wood" (217), the depth of brown foliage; the equally solid, broad, and truthful handling of R. Thorne Waite, of which he gives us several illustrations, as, for instance, the "Out-door Sketches" (132, 173, 196, 231), the broad, swelling landscape (281), the mingled colouring of 298; the forcible sketches of light and shade from Miss Clara Montalba's wonderful pencil; or we may turn to the quiet and more finished productions of C. Davidson, as in his "Rest" (8), and his peaceful "Views on the Thames" (Nos. 27, 82, 138, 293, 326, 388). Tom Lloyd, too, as a truthful delineator of natural scenery, is nowhere more conspicuous than in his broadly-coloured "View near Shanklin, Isle of Wight" (77), and the sketch, "On an Isle of Wight Farm," overlooking the blue sea. Then what spirit and transparency of colouring meet us in W. Callow's charming sketches of foreign scenery. We might instance his "Stolzenfels" (33), "Carisbrook Castle," "View of Alps" (102), "The Grande Rue, Dunkirk" (120), the sketch "On the Moselle" (127), "The Last Gleam of Day," the charming play of light and shade in "Old Norman Houses" (250), the "Venetian Sketch" (344), &c. T. M. Richardson contributes also many highly-finished pieces of landscape scenery in Argyllshire (207) and in Switzerland (256); nor must we pass unnoticed the careful execution of G. Fripp, T. Danby, and J. D. Watson. Each of these masters gives us a somewhat different interpretation of Nature: one a bold abstraction of line and colour in broad masses of light and shade, another a closer realisation of the details of the scenery, and a third reflects in some measure the mannerism and style of the older water-colour school, such as we see them in the works of Girtin, Finch, Penley, Creswick, and Bartlett. Let the visitor compare the delicate manipulation and touch of J. W. North, as in his view "From the Cottage Garden" (107), and "Pond by the Desert" (81), with the vigorously bold sketches of light and shadow in Clara Montalba's "Under the Beech Trees" (116), or her grand bit of chiaroscuro in the sketch of London Bridge (144). Can we possibly take two more extreme views of art delineation? Mr. North's landscapes, in their delicacy of manipulation, resemble the perfection of photographic minuteness. We can discover the very stalks and flower of the herbage in the foreground; the water meadows in his "Autumn" repay the closest scrutiny; he portrays the tiniest weeds, the leaflets, and flowers, all with a freshness and felicity of elaboration worthy of the most dexterous pre-Raphaelitism; while in Miss Montalba's studies the artist seeks to arrest the observer by a masterly and graphic shadowing out of the salient masses, a kind of *silhouette* in colour, with the addition of light. *Genre* subjects are plentiful. E. K. Johnson's "Sunflower," a large drawing representing a fashionably-dressed little girl bending down, with her hands, some large sunflowers considerably taller than herself, is pretty as a conception. The drawing of the flowers and green bank of the foliage is minutely and truthfully rendered, and the colouring pleasing; the artist has discarded the affectation of Old English revival in the dress of the girl, which is essentially modern in the short white skirt and black-silk stockings. His "Lilium Auratum" is also a clever companion picture, and the blossom charmingly done. "A Rustic Scene," also by E. K. Johnson, is well-drawn in the figures and the old farm-house. Some children on a low brick wall are looking at fowls on the other side; simple enough in incident, but highly finished and clear in colouring. Passing by C. Davidson's snow-clad landscape, "Rest," we are attracted by a pleasantly-drawn pastoral by Basil Bradley, "Any Chance of a Job, Mate?" a question put to a reaper in a cornfield by a sturdy and willing young man. W. Oswald Brierley sends a study on one of the lagoons at Venice, "An Autumn Squall," rich in the warm colour of sails. The Princess Louise contributes a portrait of Lieut.-Col F. de Winton, of some power; after which we may notice E. A. Goodall's "Street in Cairo," warm in tone, and the quiet and pretty landscape of C. Davidson, of Medmenham-on-Thames; Alfred D. Fripp's lucid and transparent sketch of a Beach (30); till our eyes alight on H. Stacey Marks' comical and clever picture, "The Two Dromios," suggested from Shakespeare's "Comedy of Errors," where two brothers, twins, are so much alike that even their friends are unable to distinguish them. "Henley Church and Bridge," by W. Field, is a clever sketch in light washes of tint; and "Calm Decay" (41), a highly-finished sketch of woodland. Otto Weber's "Cart-horses" are well drawn, and Albert Goodwin's "Salisbury," a delightful little sketch of the old city, showing some nice grouping, will be admired by those who appreciate careful and polished pictures; a very fine sketch by H. M. Marshall, "An Old Sussex Seaport," cannot fail to arrest attention: the smoky atmosphere and red houses are admirably true. Helen C. Angell sends a crisply drawn group of roses in No. 66, and some lovely apple-blossom on No. 213. The drapery and accessories in E. Duncan's "The Novel," and the pose of figure, are in excellent drawing and taste. For neatness and conscientious drawing, we must commend J. Parker's "Old Tithe Farm" (78), a pleasing group of gables. We can only glance at a few other subjects, such as T. R. Lamont's "Artist and Critic," childlike and truthful; "Aquila and Priscilla," a group in black and white, by F. Shields; W. C. T. Dobson's "Silvia," graceful in drawing and colour; W. M. Hale's "Valley of the Avon"; Collingwood Smith's "Crows Haunt, Haddon," rather hard in the foliage; T. Danby's study (100) a little too laboured; E. Buckman's "His Day Ashore," a feeling study of cliff and figures; J. Parker's "Little Idle One;" E. Brewtnall's "Frog Prince," a clever illustration of an old fable; S. Read's bold study of rock and sea, and his fine drawing, somewhat harsh in tone, of "Burgos Cathedral"; H. Moore's fresh woodland study; E. K. Johnson's luminous "Summer"; the finished sketch from Haddon Hall, by J. Jenkins, and his antique font in the chapel, a skilfully-drawn relic of interest. Among the few other architectural sketches, we remark S Read's "Roslyn Chapel," "A Street in Blois"; T. M. Richardson's fine view of "St. Paul's from Old Blackfriars Bridge"; H. P. Riviere's "Temple of Vesta"; and W. Callow's "Kirkstall Abbey."

The work on the screens is not to be overlooked. We find a bold and forcible bit by Clara Montalba; several cabinet studies by Miss H. Angell, B. Foster, Mrs. Allingham, S. Read, W. Callow, Carl Haag, T. Lloyd; nor can we omit to call attention to the fine collection of water-colours of Dodgson, lent by several contributors. Nos. 435, 436, 438, 441, 444, 447, 465, 467, 469, 472, &c., are splendid specimens of this artist's powers as a delineator of grandeur in park scenery and architectural compositions. Dodgson's forte was composition of ideal landscapes—a school of painting fostered by topographic works rather sentimental and academic than truthful pourtrayals of nature. In another room we have other remarkable works of this painter exhibiting dexterous manipulation, sometimes rather laboured, but always striking in their power and depth of tone. His architectural sketches of "St. Bride's Steeple," lent by E. R. Robson, F.S.A., and that of "Bow Church," are particularly noteworthy for accurate drawing, and the grey, clear tints of sepia which express the detail.

Let us turn to another collection of well-known artists. The Institute of Painters in Water-Colours numbers among its members some of the older water-colour painters. The names of Absolon, Aumonier, Bach, Boughton, Cattermole, Corbould, Fahey, Gow, Townley Green, Hargitt Hines, Mogford, Whymper, Wimperis, Herkomer, and others, are some guarantee to the public that a high standard will be maintained, though even here, as elsewhere, names are not always to be depended on, and mediocre work is to be found largely mixed with the superior kind. James Fahey is always truthful; his fine sketch of "Whitby," an early-morning effect from the Royal Crescent, is a welcome contribution; the misty air and cliff are very happily rendered, and the visitor will find other sketches of this artist of singular accuracy and graphic power. "On the Beach," by J. G. Philp, is bold and fine in tone; and near it Mary L. Gow, a well-known lady-artist, contributes one of her finest works, "Beggar my Neighbour," two well-dressed little girls in light dresses playing cards. Correct in drawing, the figures, the draperies, and appointments, are gracefully introduced, and there is a refinement and brilliancy in the colouring which adds to the charm of the study. Harry Johnson, always a bold and conscientious artist, sends a powerful sketch of rock and river in his "Walls of the Wye," a fine piece of river scenery; but we are sorry he has attempted architectural subjects. His "Tintern Abbey" (205) is weak in drawing, and rather too chromo-like to add to his reputation. A pretty conceit, worked out with considerable skill, is Lionel P. Smythe's little study, "Kindred Spirits," depicting a little girl listlessly seated on a swing in a luxurious garden, while a black cat on the ground is sleepily engaged rubbing herself against a tree, and casting a glance at her little mistress. It is a pity so much labour has been thrown away on W. Wyld's picture called "The Artist's Studio," a gorgeous room, overpowering in colour, and distracting in the accessories. Perhaps the most successful study of rock is J. G. Philp's "Cornish Bulwark," a finely-handled bit of rolling sea and coast; the reddish rock is transparent, and painted with much technical skill. Very different in subject and handling are C. Vacher's calm views of the "Pyramids of Ghizeh," bathed in roseate tints of the setting sun. The artist has caught the sleepiness of the scene in all its quiet grandeur. Mr. C. Green, as usual, sends two of his finished figure-studies, depicting with much feeling and dramatic skill, the costumes of our forefathers. "Interrupted," is a study of an old gentleman, with black stockings and knee-breeches and a large silk coat; while in 155, "The Harp-Player," we have a highly-finished sketch of a lady, dressed in the style of the 18th century, playing a harp. The accessories and draperies are exquisitely drawn. James D. Linton, a master of romantic incident, in "Autumn" and "Winter," sends two symbolic studies of costume, one, a lady attired in yellow silk with a crimson sash, holding flowers; and the other, a lady before a fire-place; but the visitor will mark more the pictorial power in Lewis Haghe's picturesque interior, No. 65, an "Ante-room in the Ducal Palace," where the Doge gave audience to his ambassadors. The figures and luxurious interior of Renaissance architure are dramatically painted, and the colouring is equally rich. In No. 213 the same painter introduces us to an imaginative subject; the Gothic portal and figures are boldly painted, intensified by body pigments; but the interior of room in the Ducal Palace (238) is a more successful study as a reproduction of picturesque features and costume. Few painters have so bewitching a power in the technical handling of the brush as Mr. G. Clausen. His "Waiting for the Ferry" (71), and "Cleaning Day, North Holland" (160), are masterly effects produced by erasure of lights and the use of the sponge. "The Old Coaching Days," by Andrew G. Gow, is a dramatically narrated incident. The scene, a bleak road at dusk, represents two highwaymen on horseback making off with their spoils, while, behind, the affrighted occupants of a coach are seen on the wayside applying restoratives to one of the travellers. We can only glance rapidly at G. G. Kilburne's "Unprotected Female," an amusing little stratagem cleverly depicted; "Charge of the Light Brigade" (99), a well-drawn bit of domestic pleasantry; "A Shady Corner," by Guido R. Bach (222), a large picture, admirable for its figure-grouping of Italian market-women and *gamins*, who have resorted here under the shadow of a high wall. The drawing is remarkably free, the colouring rich in tone, and the shadows and reflected light cleverly managed. On the same side of room we remark two imaginative compositions by Henry J. Stock, "Summer's Wraith," and "The Lovers" (214), both of undoubted power; the handling is in harmony with the subjects, and the dark shadowed figures and spectral images are cleverly softened down by the sponge. "Evil Frustrated" is another forcible conception of much power, granular in the texture of the colour. Satan is well idealised. "On the Beach" (7), "Dorothy" (201), by Townley Green, drawings by J. W. Whymper and E. M. Wimperis (198 and 200), the sketch by W. L. Thomas (195), Durham Cathedral, by Harry Hine; some exquisite cabinet studies by W. L. Leitch (165), and especially the clever sketches of French cities, by L. J. Wood (149, 172, 244) always clear and crisp in colour, though a little uncertain and winding in the drawing, are well worth attention. John Fullerlove, in his view of the "Cathedral, Siena," has contributed a refined drawing of the striated campanile, rich in the warm tones of the marble and the grey shadows. The screens contain several delightful studies and sketches by J. Aumonier, G. H. Boughton, A.R.A., L. P. Smythe, Lady Lindsay, Mrs. Duffield; and the black and white drawings in the small-room will repay a visit; it would be an omission not to name the fine etchings by Herbert Herkomer; the clever cartoons and studies for "Punch's Almanac" (133, 137), by John Tenniel, and the bold figure studies of T. Walter Wilson. In both exhibitions will be found very many indifferent pictures unworthy of being hung, and the reflective mind will come away with the impression that picture-painters, like bookmakers, are far too numerous, and that the good of art would be consulted by a desire rather to send thoughtful productions than to fill the galleries.

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A new Wesleyan chapel, with school and class-rooms beneath, was opened at Chester-le-Street, county Durham, on Wednesday week. It was designed, and also built, by Mr. William Thompson, of Chester-le-Street.

ENGINEERING AND BUILDING EXHIBITS AT THE CATTLE-SHOW.

THIS year's Cattle-Show at the Agricultural Hall, Islington, is, as usual, not without special interest to the engineer and architect, particularly those concerned in improvements relating to agriculture. Machinery and agricultural implements occupy the spaces above and below the galleries of the large hall, besides the entrance-vestibule. In these classes we find a variety of portable steam-engines, of improved construction and of excellent workmanship; but we may first glance at a few of the exhibits in the entrance, galleries and other parts, of interest to the builder. One of the first we come to is a new system of glazing roofs of conservatories, hot-houses, and various other buildings, without putty. The principle of Messrs. Tracey and Sons, of Ilford, Essex, is a metallic tubular sash-bar, forming a kind of double tube, with open slots at the outer sides to receive the glass. The models shown by the inventors appear very simple; the roof is shown, made in a series of cants or slopes, between which wooden grooved purlins are fixed to wrought-iron ribs, and upon these are placed the tubular bars, fitted into a groove in purlin at the top and overlapping the next purlin. The bars are pleasing in appearance, water-tight, and light in weight; the glass can be easily made to slide into its place, secured by a copper clip at the bottom. One merit in the system is that any unskilled workman can glaze a conservatory or hot-house without assistance from a glazier, the houses can be quickly painted, and broken glass repaired. We find the price for straight roofs is 1s. 6d. per foot, and for circular roofs 1s. 9d. per foot. In the little hall, or concert-room, is seen a variety of useful and ornamental objects. Messrs. R. Boyle and Son have a stand with their improved air-pump ventilators for buildings and sanitary purposes, of good shapes and of all sizes; Messrs. Davey and Co., of Finsbury, show their earth-closets; Messrs. Browne and Co., of Piccadilly, some stoves, in which class we must call attention to Messrs. Ewart and Son's (Euston-road) "Crown" patent boiler, attached to end of bath, the advantage of which is an immediate supply of hot water by gas or oil. The "Empress" ventilator is a good preventive to down-draughts in some situations; and the office stove, called the "Amethysta," we have already alluded to in our recent notice of the Engineering Exhibition. The "Crown" boiler is convenient in size, and cheap in price, the varieties made varying from £2 18s. to £12 12s., according to the size and quantity of water to be heated, and the large ones are guaranteed to produce a warm bath at 100 degrees in from 10 to 15 minutes. Messrs. Jones and Willis exhibit some of their lamps, of superior manufacture and lighting power; and the "Excelsior" patent spring mattress, shown by Messrs. Chorlton and Dugdale, of Manchester, is certainly an improvement upon the commoner kinds, and they afford to the body uniformity of pressure. The "Excelsior" can be applied to most wood and iron beds, and for hospital and infirmary use it seems admirably adapted, on sanitary grounds. The same exhibitors show some ingenious heating and cooking-stoves. Messrs. Lincoln and Co., of Ludgate-hill, exhibit sundry engineering appliances; and Messrs. C. Powis and Co., of Gracechurch-street, are contributors of improved sawing-machinery of economical construction. We may also, in this part, call attention to Messrs. Ransome's (Essex-street, Strand), stall of mechanical appliances, Messrs. Wright and Butler's (Birmingham) stoves and lamps, Messrs. Pfeil and Co.'s (Clerkenwell) lathes and drilling-machines, and to the excellent "Sanitas" products shown by the "Sanitas" Company, of Bethnal Green, which appear to be gaining popularity for their pleasant, effectual, and non-poisonous deodorising qualities. We find the piggeries in the hall have been disinfected by it.

In the large hall and galleries portable steam-engines, agricultural implements of every kind, from drilling-machines to corn-elevators, thrashing, corn-dressing and blowing machines, root-pulpers, and lifters, claim attention. The excellent horizontal and vertical engines and boilers of the Reading Ironworks Co., Ransome, Sons and Co., of Ipswich (Cochrane's Patent boiler); Marshall, Sons, and Co.; Robey and Co., we can only mention in our review of other manufactures interesting to the agricultural architect and landed proprietor. Iron roofing and fencing, fittings of farm-buildings, dairy utensils, wrought-iron troughs, cisterns, bins, &c., are represented by numerous enterprising firms. The models exhibited by Mr. J. C. Humphreys, of Albert-gate, show some useful corrugated-iron roofs, farm-buildings, &c.; and the builder who seeks durability and cleanliness may, in future, avail himself of the galvanised roof supplied at 3d. per foot; he will not overlook, also, the very excellent fittings for cow-houses and piggeries, shown by the St. Pancras Iron Co., of the Euston-road. The cow-stall fittings, with cast-iron fluted divisions, and the iron piggeries, are certainly improvements on the miserable and uncleanly erections and wooden fittings one sees in the country homestead. Messrs. Morton and Co., of Liverpool, send specimens of their iron roofs and wire fences, with standards for straining the wires; and for fences of a stronger kind, those exhibited by Messrs. Bayliss, Jones, and Co., at 2s. 9d., with standards 3ft. apart, the bars being fixed with tubes at the uprights, commend themselves. Messrs. Hill and Smith's patent "rivetless hurdle," shows also a very strong method of fixing. Messrs. Croggon and Co., Upper Thames-street, send specimens of their wrought-iron cisterns, tanks, and cattle-troughs; and the riveted corn-bins of Mr. J. Bellamy, Millwall, and his feeding and drinking-troughs are excellent and clean. Of other sundries, Rosher's stable paving-bricks, rustic summer-houses, &c., and terra-cotta and artificial-stone edgings, are effective and cheap, affording no harbour for slugs and insects. We can only name the "Universal" wrought-iron split pulleys; Laurence and Co.'s Capillary Refrigerators for the preservation of milk; B. Kitmer's combined dressing, blowing, and screening-machines; John Fowler's steam-traction exhibits; the Koldmoss weed eradicator, manufactured by Ord and Maddeson, Darlington. In another part, Messrs. Reynolds (Blackfriars) and Co.'s sawing machinery; and the wood-working machines of Warr and Lewis; C. Powis and Co., Gracechurch-street; the excellent pavement lights of Hamilton and Co.; and various other appliances of a mechanical, sanitary, and technical character, are worthy of examination. Domestic machines and appliances are too numerous to mention. Knife-cleaners, sewing-machines, washing-machines, and other domestic articles, are to be found in every part of the Show; and those who have no taste for cattle will find an hour or two instructively spent.

ARCHITECTURAL ASSOCIATION.

THE third ordinary meeting of the present session of the Association was held on Friday evening, the President, Mr. E. C. Lee, in the chair.

THE ORIGIN OF THE ASSOCIATION.

Mr. R. Phene Spiers read the following short paper, describing the mode and period of the Association's formation: The precise date of the origin of the Architectural Association has so often been mooted in committee when a new "Brown Book" was being collated, that I have thought the matter sufficiently interesting to note down a few facts concerning it, especially as it was alluded to in the President's address this year, and as I am able to present to the Association what may be called the first "Brown Book" in existence. The Society from which the Association sprang was called the Association of Architectural Draughtsmen. It was instituted on September 1, 1842, and its objects, five in number, are set forth in the paper attached hereto. In this paper the rooms are stated to be at 33, Southampton-street, Strand. In the *Builder* of July 15, 1843, however, notice is given of the Society, wherein it states that the members meet on the first and third Wednesdays in every month at the Café Royal, 42, Castle-street, Holborn, and a letter to the editor of that paper from Mr. J. K. Colling, who appears to have been one of the most active members of the Society, states:—"Sir,—It may not be known to you that a Society exists called the British Association of Architectural Draughtsmen, having for its object, by union and co-operation, the providing with employment those of its members who may require it. For this purpose a register is kept of those unemployed, and which is available to architects who require assistants also. Each member of the Society furnishes quarterly a drawing of some executed architectural subject, which drawings are kept in the portfolio of the Society, and not only form a means of collecting vast professional information, but a sure guide to architects by which to judge of the ability of the assistants they may select. Connected with the Society, we have also established a benevolent fund, for assisting those on our books who, through misfortune or ill-health, may require it." Mr. Colling then goes on to say that he has much pleasure in forwarding a drawing for publication, and hopes to be able to supply others. This drawing of the chancel-window of church at Little Maplestead was published, being, however, the first and last of the series. Nothing more is heard of the Society till February 3, 1847, when Professor (then Mr.) Kerr reads a paper on "Architectural Education," at the rooms in Southampton-street, Strand. This paper was a very important one, and led to the immediate formation of the Architectural Association, which sprang, Phœnix-like, out of the embers of the decaying Association of Architectural Draughtsmen. The next notice I find in the *Fine Arts Journal*, in which it appears a meeting was held on March 3, to put into operation one of Mr. Kerr's proposals, viz., to embody "a school of design"; and it was then stated that the object of Mr. Kerr's paper, from which this scheme (the formation of a school of design) emanated, was to form a Society upon an enlarged scale with a comparatively trifling subscription, which would induce every student of the art to avail himself of its privileges. Some amended rules were read out, approved of, and a number of new names were proposed for membership. A sub-committee of the old Society was then appointed to meet a deputation of the newly-proposed members, and to arrange at once upon the actual working of the new schools. The next notice is on May 5 of the same year, when a paper was read by Mr. Colling before the already-formed Society still meeting in Southampton-street. On July 7, 1847, a paper on "Architectural Style" was read by Professor Kerr, who had been elected President; and on October 8 the first conversazione was held at the new rooms in Lyon's Inn Hall, at which over a hundred persons were present, when the President, Mr. Robert Kerr, delivered his opening address. It then numbered 80 members. The Association remained there till April, 1859, when they removed to this building.

THE ARCHITECTS OF THE RENAISSANCE.

Mr. W. Hilton Nash read a paper bearing on this subject, the first part of which will be found in a separate form on the opposite page.

At its conclusion, Mr. H. L. Florence said he regretted that Mr. Nash had selected a period of Italian architecture so wide, and containing so many names, that it had been scarcely possible to do more than allude to them. Equal length had been given to each, whereas a few deserved much more consideration than the general mass. The lecturer had divided the architects enumerated into four schools, but he had not indicated the characteristics of those schools, which were well marked out. To those who had seen the buildings referred to the works of the several architects were distinguished by individual peculiarities. For instance, no style could be more distinctly different in character than that of Bramanti and Palladio. The work of the latter was indeed a dilution of that of Michael Angelo, who, in architecture, was not a model worthy to be copied except for his treatment of domes. Mr. Nash had not alluded to the Venetian school, whose works were especially useful to us at the present day, particularly in the subdivision of windows and the use of orders, and deserved careful study. Of this school one of the best was Longhena, who had not been mentioned. He proposed a vote of thanks to Mr. Nash, not only for his paper, but for having volunteered to prepare one, at short notice, when the syllabus had to be departed from.

Mr. H. H. **Stannus** agreed with the last speaker that Longhena deserved a place in the Pantheon of architects, but suggested that the reason for his omission was that he lived somewhat later than the period included in Mr. Nash's survey. The lecturer had omitted to distinguish between the two architects known as Sansovino—Andrea, who was properly a sculptor, and carved the beautiful tombs in the choir of San Maria de la Popolo, at Rome; and his pupil Jacopo, who carried out the well-known Library of St. Mark, and other works at Venice. The lecturer had referred to the princely patronage and munificent pay the Italian architects enjoyed, and had implied that our architecture would be better if this state of things prevailed now. In this he could not agree with him; there was now a wide-spread patronage of art, and the pay was fair all round. One reason that made modern work so poor was that our architects were so greedy: they took far more work than they could properly carry out or supervise, so that numerous clerks had to be employed to get out the drawings, and in some cases, even if a building of different style to that they worked in were required, they did not hint at turning over the work to others who designed in that style. Justice could not be done to a building if the architect was so pressed by his work that he could give neither time nor consideration to it. Raffaelle and Michael Angelo had been included in the list of painters; but although they were admirable artists, they failed when they tried to build, from a want of knowledge of details. Palladio, again, was not an architect deserving to be copied; but as an author had done more to popularise architecture, and to systematise its study, than any of his contemporaries. In seconding the vote of thanks, Mr. Stannus added that he hoped to go in more detail into the subject three months hence, when he proposed to describe the Association's excursion to Lombardy.

Mr. R. **Phene Spiers** said Mr. Nash had seemed to look down upon our painters and sculptors because, unlike the Italians of the 15th and 16th centuries, they had attempted no architectural work. He believed, however, that several of our most distinguished painters, if placed in a similar position to the men spoken of, would evince equal facility in designing. The President of the Royal Academy had displayed a warm sympathy with the general expression and feeling of Greek architecture, and no one could vie with Mr. Alma Tadema in intimate knowledge of every detail and surrounding of Roman life of the 1st and 2nd centuries and the last days of Pompeii. On the other hand, several of our architectural students had developed into painters, including the late W. W. Dean, who had powers as a draughtsman which ought to have been useful to him, but who failed to gain practice because he had no connection. The Italian artist of the 15th and 16th centuries seemed to have usually been grounded in mathematics, and to have been trained, at the same time, in modelling, drawing, and the use of colour, and often in mature life was called upon to design and superintend the erection of public buildings. The present system of contracting would render an attempt at such a course of training fatal, and it was certain that no man who now entered the profession at 40 could succeed.

The vote of thanks having been accorded with applause, Mr. **Nash** replied. He would admit that Michael Angelo was not great as an architect, as his details were faulty; but this arose from want of training. That he strove hard to correct this was evident from his drawings, still preserved at Florence, in which a feature was often altered again and again, in one instance as many as 12 attempts being made to improve the design. Longhena had not been mentioned, as he flourished at a later period than that to which he had confined himself. He was sorry he had not clearly distinguished between the Sansovinos; the second—Jacopo—was the only one he had alluded to. He condemned, with Mr. Stannus, the modern practice of architects seeking and taking more work than they could carry out, as the cause of much poor architecture.

THE ARCHITECTS OF THE ITALIAN RENAISSANCE.*

It is almost impossible, within the limits of a short paper, to do justice to the number of illustrious names which crowd upon us at this epoch, and we can, therefore, only dwell briefly on the lives of the architects of the fifteenth and sixteenth centuries, and the motives which actuated these men to produce works which daily increase in interest, and compel us to offer our tribute of respect to the energy of mind and purity of thought as exhibited in them. Although many may take exception at the over-elaboration of detail, and to the naturalistic treatment of ornament in Late Renaissance works, yet we may discover in nearly all instances a freedom of design which, in earlier times, and especially during the Middle Ages, was often cramped and fettered by ideas which emanated from the seclusion of the cloister and the austerity of monastic life.

The architecture of the Italian Renaissance may be roughly divided into four schools—the Florentine, the Roman, the Venetian, and, lastly, the Baroque school.

To the first belong the palaces of the Medici, the Pitti and the Strozzi at Florence, both having in them traces of Mediævalism and predominating strength. The house of the Florentine noble was literally his castle; the dark portal, and massive walls pierced with narrow openings, and the rugged rustication of the walls, all point to the troublous times in which these nobles lived.

The Roman style is less massive in treatment, and ornament is introduced less sparingly; a more refined taste was being developed, as evidenced in the works of Fontana, Sangallo, Bramante, and Michael Angelo—such as the Farnese Palace, the Palace of St. John Lateran, and the numerous villas with which the environs of Rome are studded. As to the churches of the Roman style, that of St. Peter's gives the keynote to all the others, and as almost all the first architects of the two centuries we are considering were engaged upon it, we may see in it the embodiment of this style.

The Venetian school is characterised by greater lightness and elegance, and includes among its ranks such men as San Michele, Palladio, and Sansovino; and the Library of St. Mark at Venice, by the latter architect, forms a typical example of this school.

The Baroque style, introduced by Maderna, Borromini, and others, marked the decline of Renaissance art; its effects were, nevertheless, novel and striking, but were wanting in dignity and repose, and figures in impossible attitudes, clinging for dear life to broken pediments, marked the degenerate taste which prevailed.

First among the architects of this century, when the first faint glimmer of the dawn of the Renaissance was stealing over the land of Italy, stands the name of Filipo Brunelleschi, son of Lippo Lapi (born 1377, died 1444), who, though educated for far different pursuits, at an early age brought his powers of mind to bear, first on geometry, then on Dante and his writings, and eventually applied himself wholly to architecture, and, by earnestly studying the ancient masters in Rome and elsewhere, became imbued with the true spirit of the antique, and revived the ancient orders of the Doric, Ionic, and Corinthian. The two greatest works of this architect were the Pitti Palace at Florence, and the cupola over the cathedral, Santa Maria dei Fiori, in the same city. The Pitti Palace has a rugged simplicity which makes this building astonish us, rather by its broad treatment of masses than by any delicacy or refinement of detail. The entire building is covered with rustic work, the blocks of stone in the lower story and in the wall of the terrace flanking the courtyard being of such an enormous size that they look like the work of giants. Some idea of the large proportions of this building may be obtained from the entrance-doorways, which measure about 28ft. in height by 14ft. in width. But Brunelleschi did not live to complete his work, and only carried the building as high as the second story, and later on Ammanati added mouldings and triangular pediments to the windows, to the detriment of the original design, which, as has been before stated, owed its beauty in a great measure to its simplicity of treatment.

When Brunelleschi's grand conception of raising a dome over the church of Santa Maria dei Fiori at Florence was first promulgated, his project was hailed with derision, and to prove that he was capable of performing what he undertook to do, he had recourse to the trick afterwards practised by Columbus. When the persons who had been clamouring to see his design were assembled, he produced an egg, and asked each one present to make it stand upright on the table. All tried, but failed, when Brunelleschi, striking off the end, accomplished the feat. "We can do that also," exclaimed those assembled. "So you will say when you have seen my design," replied the architect. The height of the cupola from the ground to the summit of the cross is 385ft. It consists of an outer and inner shell connected together at intervals by walls, and it is octangular on plan. Other cupolas had been constructed previously to this, as at St. Sophia's, Constantinople, St. Mark's at Venice, and the Baptistery at Pisa; but this one outrivalled them all, both in size and ingenuity of construction. Brunelleschi was great not only in civil and ecclesiastical, but also in military architecture, for he designed the fortresses of Vico Pisano, the old and new citadels at Pisa, and he also built fortifications on the Ponte Amare. He died respected and beloved, and was buried under the shadow of his great dome at Florence; posterity has, moreover, awarded him the highest honours, for to him we owe the re-establishment of pure architecture and manly design.

Leon Battista Alberti (born 1398, died 1472) was a nobleman by birth, and son of Lorenzo and nephew of Cardinal Alberti of the Alberti, a Florentine family. Educated with the greatest care, and having a knowledge of mathematics, painting, and sculpture, and possessing a natural taste for the fine arts, he was not long in deciding on the profession which would be most suitable to a man of such varied acquirements. The church of San Francisco at Rimini bears witness to his powers of design, and is perhaps the most talented of all his works. The interior is still in the Gothic style, but the whole of the exterior was remodelled from his designs, and embellished with choice marbles. At Florence, Alberti built the circular chapel of the Annunziata, which is wanting in many of the graces distinguishing his other works. The semicircular arches being circular on plan, have, as is usual in such cases, a distorted appearance, which mars the effect of the composition. The principal façade of Santa Maria Novella is attributed to Alberti; but Milizia, in his "Lives of Celebrated Architects," states that it was probably built by Giovanni Bellini. His life was passed as a true nobleman's should be, in liberality and courteousness to all, and he died at an advanced age in his native land.

During the early part of the fifteenth century, when the revived art was only feeling its way, and had not obtained that firm footing on the soil of Italy that the following century established, the names of great architects were few in number, and the two whose lives we have just considered,—namely, Brunelleschi and Alberti—were the guiding stars of this epoch. Nevertheless, other architects flourished, some of whose works were of no mean merit, and amongst these were Michellozzo Michlozzi, a Florentine and a pupil of the sculptor Donatello. This architect succeeded in making a design for the palace of Cosmo de Medici, by which he secured the patronage of that influential man, and superseded Brunelleschi, who had previously made a design which was considered too sumptuous. Michelozzo built the famous library of the Benedictines at San Giorgio, Venice, to which city Cosmo had been banished in 1433, and whither his architect followed, with a devotion rarely witnessed in modern times. He made designs for and built the palace of Cafaggiulo, in Mugello, by order of the Duke Cosmo; also an ingenious villa at Fiesole, near Florence, on the side of a hill, with large cellars and stables under part; also the palace of the Tornabuoni, now belonging to the Marquis Corsi. Michelozzo died at the age of sixty-eight, and was interred at the church of St. Mark, at Florence.

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* A paper by W. Hilton Nash, read before the members of the Architectural Association, on Dec. 3rd. (See preceding page.)

Giuliano da Majano was also a Florentine, being the son of a stonecutter residing near Fiesole. Having studied architecture, he had the good fortune to be patronised by King Alphonso at Naples, where he built the great palace at Poggio, which is an exact square on plan, and is chiefly noted for the clever arrangement of its staircases.

About the middle of the fifteenth century flourished the celebrated architect, Bramantino, whose field of operations was chiefly in Milan and the surrounding district. He erected the Church of St. Satiro in that city, which has been much praised, more, however, on account of the sumptuousness of its decoration than for its beauty of design; for the numerous arcaded corridors, and the many statues with which it is adorned detract from the main features of the design, and render them somewhat confused. Bramante, of whom we shall speak later on, is said to have benefited by studying his works, and we see tokens of this in many buildings erected by him.

Giovanni del Pozo and Francesco di Giorgio, of Siena, rank among the lesser lights of this epoch. The latter, however, erected some very creditable buildings, chief among which is the famous palace of the Duke Frederigo Feltre, at Urbino.

The sister arts of painting and sculpture were frequently combined in these times with the more practical art of building, and the appellation of "painter and architect" was as common then as "architect and surveyor" is in the present day. The artistic ideas of the nineteenth-century architects are often deafened by the worry of business; and this is greatly to be deplored, for the real artist should be free from the petty cares and anxieties which engross the bustling matter-of-fact people of the present day.

A liberal emolument will not evoke talent; nevertheless, architects, to do their work truly and thoroughly, require to have sufficient means to enable them to drive away anxious thoughts for the morrow, and the ancient architects were undoubtedly treated in a more liberal manner than those of to-day, or they could never have bestowed that painstaking care on their buildings which is so frequently exhibited, since their whole time and thoughts were often confined to one building, while the multifarious duties of the nineteenth-century architect disqualify him from taking that high position which was so acquired by the architects of the Renaissance.

Having now briefly considered the architects of the fifteenth century, we pass on to those of the sixteenth century.

When on some bright summer's night we gaze upon the cloudless heavens, and see there some grand constellation which rivets our attention, and become for a time almost forgetful of the lesser luminaries, so it is when we pass in review the architects of the sixteenth century. Their names stand out so boldly among the lesser lights of art that we are for a time unaware of the existence of preceding or posterior artists, and we cannot help asking ourselves the cause of this great uprising and rebirth of intellect at a period when all true art seemed lost in a hopeless chaos. This great awakening to the study of the beautiful and the true was mainly attributable to the cultivated tastes and judicious patronage of the leading families in Italy. They were the great motive-power which set the machinery of art in motion, and evoked the slumbering talents of men capable of greatness in every department of art—in painting and sculpture, in poetry, music, and architecture. Well might Michael Angelo and other contemporary architects have said of the Cosmos and Leos of the Medici family, as Horace said of Mæcenas, "O et præsidium et dulce decus meum," for had it not been for this opulent and cultivated family, many a talented artist who now illumes the page of history would have died "unwept, unhonoured, and unsung." Art patronage, however, is not the prerogative of the many, but rather the privilege of the few; and, like other good things, it must be judiciously administered, or its effects will be more baneful than productive of good; for far greater detriment is done to art by the ignorant patron, who enriches those who unjustly deserve it, than by the man who, though appreciating talent, fails to render it its due reward.

Bramante d'Urbino, though born at the end of the fifteenth century at Castel Durante, is generally classed among the architects of the sixteenth century. His talents were directed at an early age to painting, but he quitted it for the sister art of architecture, having studied and measured the principal ancient buildings at Rome, and the remains of the villa Adriana at Tivoli. His chief patrons were the Cardinal Caraffa, the Popes Alexander VI. and Julius III., and the Duchess Eleonora Gongaza, the latter of whom commissioned Bramante to build a palace for herself and her husband, the Duke d'Urbino. The greatest work of this architect was undoubtedly the rebuilding of the church of St. Peter at Rome. In this design he equalled, if he did not surpass, the ancients, in the massiveness and unity of treatment which pervades the whole edifice. Strongly impressed with the grand proportions of the Pantheon at Rome, which, no doubt, he had studied in the days of his pupilage, he founded his design on this model, and made his cupola of similar dimensions, adding the four arms of the Latin cross, forming, when completed, a building of unequalled vastness and grandeur.

Bramante could boast of having Raffaelle for a pupil, and Michael Angelo for a friend and adviser, and the great sculptor states his opinion that "Bramante is superior to all others since the time of the ancients."

Shall we praise or blame Bramante for the revival of the use of plastering and stucco ornament? There is much to be said in favour of the way in which he employed it, namely, on a wooden foundation; but unfortunately it latterly fell on evil times, its true place and use being forgotten, and the stucco, instead of assisting to decorate the buildings, served only to overburden them with vulgar ornament. This is specially noticeable at Vicenza, where Palladio, not having had funds sufficient to erect his sumptuous designs in stone, has had recourse to plastered columns on a brick core, and the effect of time on these buildings has made them look pitiable in the extreme, and has given occasion to architects of the opposite school to decry all architecture of the Palladian school as a sham.

The most beautiful erection by this architect is the palace of the Cancelleria at Rome. The windows on the "primo piano," or first floor, have served as models for countless others, but none have surpassed the original. The façade is constructed of blocks of travertine from the Colosseum, which, during this century, served as a sort of quarry for numerous Roman palaces.

The beautiful dome of the Church of Santa Maria delle Grazie, at Milan, is certainly the most satisfactory of any of Bramante's works, and, as Fergusson says, in his "History of Modern Architecture," "Had the architects of the succeeding age been only content to work with the moderate amount of Classical feeling found in this building, we should have had no cause to regret the loss of the Gothic style; but the temptation to employ great pilasters and pillars, whose real recommendation was that they covered the greatest amount of space with the least amount of thought, was more than human nature could resist, on the part, at least, of men who were more artists and amateurs than architects."

The dome of Santa Maria is 65ft. in diameter, and is consequently one of the largest constructed by Bramante, that at the church at Lodi being 50ft., and the dome of the little church of San Pietro, in Montorio, at Rome, being only 15ft. in diameter.

Bramante died in the year 1514, at the age of seventy, and was buried in great state in the church of St. Peter, the grand work of his lifetime, and which, had it being executed as originally designed by him, would have been a church worthy of the golden age of Renaissance art.

(*To be concluded.*)

ARCHITECTURAL MARBLES AT THE PHŒNIX WORKS, PLYMOUTH.

A WORK of art in decorative marbles is making rapid progress at Messrs. J. and E. Goad's Phœnix Marble Works, Stonehouse. As the greatest work which has yet been executed in Devonshire marble, it is, remarks the *Western Morning News*, an important undertaking which tests fully the capabilities of the stone, and on its completion will redound a proportionate degree of credit on one of the most promising of local industries. The contract which Messrs. Goad are executing is the marble for the church of the Brompton Oratory, South Kensington (which by the courtesy of the architect, Mr. H. A. K Gribble, we have repeatedly illustrated). The Oratory has a cruciform nave, sanctuary, and chapels, and a vaulted roof richly decorated. The arcading of the whole building will be supported by columns of Devonshire marble, and massive shafts with pilasters of similar stone will uphold the central dome and flank the entrance of each chapel. Around the sanctuary and down the transepts, marble pilasters will spring at intervals. The effect of the lower section of the building will be harmonised by the introduction of marble dado work encasing the bases of all the arches, and the vaulted roof, ninety feet above, will be panelled with frescoes and decorative mouldings. The importance of the marble work in the structure is illustrated by the fact that when completed the polished blocks will amount to a gross weight of more than 1,000 tons. The four massive piers supporting the dome, each of them 17ft. across the face, will be encased in marble. The pilasters facing the nave and transepts will have a height of about 40ft. from base to capital. Each of the circular columns in the arcading will be 19ft. high, and of proportionate solidity. And of these towering shafts there will be in all fifty-eight — twenty-six of the circular columns and thirty-two of the pilasters. The dado-work, again, and the bases and capitals of the columns must be added to this enumeration.

The marbles for the several sections of the work have been selected with obvious care as to colour and texture. All the plinths throughout will be of Devonshire black, from the Billacombe and Pomphlete quarries. The dado-work will be of dark mottled, also from Pomphlete. The moulded base of each pilaster is a picked specimen of green marble, which also comes from quarries in Devonshire. The shaft of each pilaster will be of red Devonshire marble, cut in the quarries at Radford. The plinths of the columns, like these of the pilasters, will be of Devon black, the moulded bases of a sienna-tinted variety from Radford, and the columns themselves of a mottled stone from Pomphlete, which is veined with remarkably rich colours. We believe the Corinthian capitals will be of white Sicilian marble.

The process by which the circular columns are brought to the mirror-like smoothness which they ultimately present is interesting if complicated. The stone reaches the words in Phœnix-street in rough scabbled blocks, not easily distinguishable from building stone. All the work on them, after the rough-dressed blocks have been produced, is done by steam machinery. Each column-section is fixed on a rotary axis, in a travelling bed, and revolves under a disc of solid steel, specially hardened, which, bearing with a pressure of perhaps a ton against the revolving block, cuts it to true circular proportions with infallible accuracy. The machine is, in fact, a powerful lathe, in which the block goes on revolving until reduced to its final shape. Three of these sections, making a complete column, are next brought to the polishing machinery. The whole art of preparing them consists in bringing the profile of the sectional blocks to such a continuous line that when they are fixed the polished surface will not betray any break. After the lathe has done its work completly the column is fixed in its complete state, and by successive polishing processes, ending with the use of emery-powder and putty-powder, bring up the faultless surface in which all the beauty Nature has blended in the marble appears in its most perfect state. Next to the green stone the sienna veined marble is the most imposing. The warm background shows up spongy sections of delicate madrepore, anemones fossilised in every shade, some sections suffused with the rich brown of hematite, others shot with delicate tints of pink, or veined with ochre, which seems to have been fixed as it trickled through the rock. The pilasters, which are suffused with a tone of red that would give warmth to any interior they might adorn, are equally pleasing, and all the marble is obtained from Messrs. Goad's quarries, within five miles of Plymouth.

DIFFERENT MODES OF ERECTING IRON BRIDGES.

AT the meeting of the Institution of Civil Engineers on Tuesday, the paper read was on "The different modes of Erecting Iron Bridges," by Mr. Theophilus Seyrig, M. Inst. C.E., of Paris.

The various modes were ranged by the author in four classes:—1, erection upon staging; 2, erection by lifting bodily; 3, erection by rolling-over; 4, erection by building-out.

1. In erection upon staging, the timber piles or standards were either spaced in rows at equal distances apart, or clustered together, leaving wider spaces between the clusters. The use of standards equally spaced was illustrated by descriptions of the timber stagings employed in the erection of the railway-bridges over the Theiss, at Allgyö in Hungary, with 328ft. span; over the Erdre, at Nantes, in Brittany, with 321ft. span; and over the Thaya, at Znaïm in Moravia. As examples of clustered standards, the timber stagings were described of the Pont du Carrousel, Paris, with 157ft. spans; Bordeaux bridge with 253ft. span; the railway bridge over the Lek, at Kuilenburg in Holland, with 492ft. span; and Bommel bridge over the Waal, with 393ft. spans. A light iron platform suspended from chains was employed for erecting El Kantara bridge in Algeria, at a height of 393ft., with 184ft. span. Light iron lattice girders, supported on clusters of timber piles, were used for erecting the railway bridge over the river Inn, at Köuigswart in Bavaria, with 3 spans of 227ft.; but the intermediate piles in the middle span having been swept away by a flood, a temporary wrought-iron framework, stretching across the entire opening, was erected by overhang, its panels advancing from the piers at each side, and meeting midway. Erection upon staging involved the cost of a temporary structure, the whole of which had to be removed after the completion of the permanent work. In many cases this cost was compensated by rapidity, convenience, safety, and cheapness in the erection of the bridge. The danger incurred by staging constructed across rivers liable to floods and drift was exemplified by disasters to the staging at Hamm railway bridge in Rhenish Prussia, crossing the Rhine with 340ft. spans; by settlement of the staging at Kuilenburg-bridge; and by the mishap at Königswart-bridge. Otherwise staging afforded safety and facility for erecting the permanent work, which latter was subjected to no undue strain prior to its completion. Rapidity of erection upon staging was illustrated by examples of bridges put together on the American system of pin connection, without riveting.

2. Erection by lifting bodily had its origin at the Britannia bridge in 1848, the four large tubes of 470ft. in length being constructed on shore, and floated upon pontoons into position between the piers. The plan was imitated at the Saltash bridge for the two large spans of 455ft.; and at the railway bridge over the Weser, near Bremen, in 1867. The railway bridge at Moerdyk in Holland, having fourteen openings of 328ft., had lately been erected in a similar way; by aid of the tide the girders constructed upon the bank were floated on pontoons, first to an intermediate halting place, and thence to the bridge piers. At Niagara bridge, spans of 197 and 248ft. were erected upon a floating staging, consisting of a platform carried on pontoons. Erection by lifting bodily admitted of large girders being constructed conveniently and in a safe situation, whence they were afterwards floated in a few hours to their intended position; the difficulties were thus concentrated at the fewest points, and the danger was limited within the shortest time. It required, however, the employment of a special gang of bargemen; and involved a considerable outlay for pontoons and tugs, which on a very large work was more than recouped, but not on a small number of spans or light girders.

3. Erection by rolling-over is applied to continuous girders extending over two or more spans. It involved the principle of planning the work with regard not only to its final purpose, but also to the means whereby it was to be carried out. The facility of erection by rolling-over led to its original adoption for the Sarine railway viaduct at Freiburg in Switzerland, where the roadway was constructed on the hill, behind one of the abutments, and then, by means of windlasses, was pushed bodily forwards upon rollers across the successive openings of 160ft. between the piers. A similar method was carried out for Stadlau-bridge at Vienna, crossing 232ft. spans. At Waldshut-bridge over the Rhine in Switzerland the windlasses were replaced by ratchet-wheels keyed on the roller-spindles, and worked by levers, whereby the rollers were transformed into driving-rollers, and the use of hauling-ropes was dispensed with. Erection by rolling-over presented the advantages that the main work of constructing the bridge was carried on in safety and convenience upon the bank, the actual rolling was attended with but little expense, and the plant used could be again employed. It was limited, however, to continuous-girder bridges; the bottom booms of the girders must be of ⊥ section; and the lattice sides must be strong enough to withstand considerable compression, and prevent the bottom booms from bending dangerously. The bottom booms were strained by repeatedly passing over the rollers, with changing direction of the strains; and the joints of the lattice-bars were liable to be injured thereby. For the replacing of existing bridges by new work in a very speedy way, the new roadway had been erected alongside the old one, and had then been rolled into its place sideways. On railways in Hungary and Austria a number of timber spans, varying from 26ft. to 210ft. had thus been successfully replaced. A description was given of the operations at Hernad-bridge on the Oderberg and Kaschau line, where two 82ft: spans were thus renewed with only about four hours' interruption of traffic. In the renewal of one of the Prater bridges on the Austrian State Railway, near Vienna, the new bridge of 350 tons weight, constructed of bowstring girders of 200ft. span, and carrying two lines of way, was rolled into position upon a live set of old cannon-balls, instead of upon rollers; the same device had previously been used in renewing a single-line bridge over the Waag, at Tornocz. Rolling had also been applied to the temporary timber-staging employed for the erection of the permanent structure. This method was illustrated by the successful erection of Saint Just-road bridge over the Ardèche, in France, with 152ft. clear openings spanned by arched wrought-iron ribs. Another example was Regoa-bridge over the Douro, in Portugal, with spans of 162ft. and 263ft.; here the rolling timber-stage got so strained in the earlier operations as to require the support of intermediate timber-piers in crossing the later spans.

4. Erection by building-out, in which the permanent structure was made use of for its own erection, dispensed altogether with extraneous appliances, these having been successively less and less depended upon in the modes of erection previously described; lifting bodily required less plant than staging, and building-out still less. El Cinca-bridge, in Spain, the first erected by building-out, had an arch of 230ft. span, each half of which was erected as a cantaliver or wall-bracket projecting from the abutments until their ends met midway. At the steel bridge over the Mississippi at St. Louis, with two side arches of 502ft. span, and a central one of 520ft., the half-arches were erected from the masonry piers, proceeding on both sides of the piers simultaneously, so that the lateral strains should counterbalance one another. The most recent example of erection by building-out was the railway-bridge crossing the Douro, near Oporto, with a crescent-shaped arch of 525ft. span, the height of the extrados at the crown being 200ft. above the water. The abutments and the iron piers on each bank having been first erected, and the continuous roadway girders having been pushed across them far enough to overhang the arch 105ft. at each side, the arch itself was then erected, panel by panel, from the springing, the overhanging panels being successively supported by wire-ropes tying their outer extremities to the horizontal girder overhead, where it rested on the pier. The principal details connected with the erection of this bridge were described at length, as an example of work carried to a completely successful issue under conditions insuring great safety. Exceptional cases apart, iron bridges of all kinds, from arched bridges to lattice swing-bridges, admitted of being erected without the use of auxiliary girders or staging; and under good management it seemed likely that such independent modes of erection would most frequently prove economical.

The paper was illustrated by a series of diagrams.

THE LATER PERIOD OF ARCHAIC GREEK SCULPTURE.

ON Friday last the new Professor of Archæology at University College, London, Mr. C. T. Newton, C.B., D.C.L., M.A., Keeper of the Greek and Roman antiquities in the British Museum, wound up his inaugural course of lectures on "Archaic Greek Art" with an extra one on "The Later Period of Archaic Greek Sculpture." The five previous lectures treated of the earlier stages of Greek art, from its rude beginnings at Mycenæ to the period when great advances had been made in the casting of bronze, when marble had come into more general use as the material of sculpture, and when we first found Greek inscriptions on works of art. In these five lectures Greek art was traced to as late as about B.C. 520. The later archaic period might be conceived as extending over about the half-century from B.C. 520 to about B.C. 470, soon after which date Phidias flourished. This period of 50 years was pregnant with great historical revolutions, the ultimate results of which were to establish the pre-eminence of Hellenic civilisation and secure the national independence. Within this period fell the expulsion of the Pisistratidæ from Athens, the defeat of the Carthaginians by Gelon, and his rule and that of his brother Hiero at Syracuse; the revolt of the Ionians from Persia, and their final submission after the fall of Miletus; the successive victories of the Greeks over the Persians at Marathon, Salamis, Platæa. In the same age tragedy under Phrynichus and Æschylus was developed at Atheus, Pindar flourished, and Herodotus was born. The progress of art during the same period was commensurate with these great changes. One principal cause of this was the growing importance of the great Agonistic festivals, especially of that of Olympia. It became the custom for victorious athletes or winners of the chariot-race or horse-race to dedicate statues and groups in commemoration of their victory either at Olympia or in their native cities. Bronze was the principal material used, and thus the artists gradually learnt how to represent groups in violent action, while their observation of nature was sharpened by the study of living forms. Ageladas, an Argive sculptor, who was the teacher of Phidias, made several of these groups. Onatas of Ægina was another celebrated sculptor of this period. He made at Olympia a group representing the Greek heroes casting lots who should fight with Hector, and other groups and statues at Olympia. Three artists of this period—Canachus, Callon, Calamis—are associated in two well-known passages of Cicero and Quintilian, from which we gather that, in the judgment of Roman critics, Canachus and Callon were harder in style than Calamis and less true to nature. The most notable work from the Attic school in this period was the group of Harmodius and Aristogiton by Critius and Nesiotes, of which we may form some notion from a group in marble extant at Naples, from an Athenian coin, and from a vase. Calamis, who was an Athenian artist, excelled in the representation of horses, and commemorated the Olympic victories of Hiero by bronze groups at Olympia. Pythagoras of Rhegium was another sculptor who made statues of Olympic victors, and who is distinguished as having made considerable advance towards the more correct rendering of nature, especially in the representation of the surface of the body with its veins and muscles. The temples built in this period further promoted the progress of sculpture by the decorations they required in the metopes and pediments. Thus artists were exercised in the composition of complicated groups of figures in the round. The lecturer then described the various drawings which were exhibited:—Two metopes from temples at Seliuus, in Sicily (the earlier might date from as early as B.C. 600, the other probably as late as B.C. 470); one side of the frieze of the Harpy tomb; casts of two Sphinxes from Xanthus; a bronze representing the Apollo of Miletus; the western pediment of the temple of Athene, at Ægina; a coin of Syracuse of the time of Gelon I.; a terra-cotta figure from Camirus, in Rhodes; the warrior on an Athenian stele, by Aristocles; and a seated figure of Athenê, from Athens.

ST. ALBAN'S ABBEY.

In a letter to the *Times* of Tuesday, Archdeacon Blomfield writes:—

"Without desiring to stir the ashes of a controversy now, perhaps, beginning to die out, and without hoping to alter an inevitable conclusion, I yet feel constrained to ask you to publish one letter from me, and one only, on the restoration of the west front of the Cathedral of St. Alban's. I do so as one of those for whom an official stall is provided in the new cathedral, and as representing in some degree an important part of the diocese—the county of Essex. Many of us still object strongly to the plan of Sir Edmund Beckett, in so far as it involves the destruction of the existing Perpendicular west window, and the substitution of one of modern design. We do not consider that this step is justified by the fact that former church-builders would have treated the work of their predecessors exactly as it now proposed to treat the work of Abbot Wheathampstead. Because others did wrong in the 15th or the 16th century, that does not justify our doing a similar wrong in the 19th. —The public have now before them the design of Sir E. Beckett, in the Building News for November 26, and that of Mr. J. O. Scott in the same periodical for December 3, the latter, it is true, in a form which presents it more advantageously to the eye. Of the comparative merits of the two designs in other respects I do not presume to speak, but many will be of opinion that the 'conservative restoration' which was advocated by Canon Davys in his paper read at an archæological meeting at Lincoln in October last, and which is carried out in Mr. Scott's design by the retention of the west window as it is, is far more worthy of the cathedral, and more in keeping with what has already been done there, than such a departure from all indications of the original work as is involved in Sir E. Beckett's new window. Against that departure, and against that part only of Sir Edmund's munificent restoration, we desire to record our emphatic if unavailing protest."

The *Academy* criticises Sir Edmund Beckett's design for the west front of St. Alban's Abbey, which we published on the 26th inst., as follows: "We are told that it is in the 'Early Decorated style,' but it has at least the merit of carrying its century very plainly written upon it. The only mistake a future critic is likely to make about its date is to put it at 1840 instead of 1880. Nothing of the old front is to be retained except part of the doorways. The fifteenth-century window, which, although not a work of a high class, was at least designed with some architectural knowledge, and contributed largely to the dignity of the nave, is replaced by a clumsily designed 'geometrical' window inspired largely by Sir Gilbert Scott's east window at Doncaster. The effect of this will be to depress the nave as much as the old one raised it. The wings have no windows, and are covered with blank arcades, which we should not have discovered to be in the 'Early Geometrical style' if we had not been told it. But the crowning bungle is in the gables which surmount the entrances, especially in those at the sides. It is unfortunate that so important a building as St. Alban's Abbey should be sacrificed to the whim of an obstinate amateur; but the execution of his design at his own expense will be his most appropriate punishment, and the next generation will judge of the wisdom of those who have vainly attempted to stop him."

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LINCRUSTA-WALTON.

We have several times noticed the new Sunbury Wall Decoration, introduced some time since by Messrs. Walton and Co., of Sunbury-on-Thames, under the name of "Linoleum-Muralis." This material, which has been deservedly received with public favour, is henceforth to be called "Lincrusta-Walton," from *linum*, flax, and *crusta* relief, the inventor's name being added to prevent other firms from using the word "Lincrusta" after the first patent has expired.

The material has now been in use several years, and has been employed by many of the leading architects in important buildings in the metropolis and provinces. For the sake of those of our readers who may not know its properties, we may draw attention to its impermeable and non-conductive nature, its hardness and toughness, the readiness with which it can be cleaned and fixed, qualities which must commend themselves to all sanitarians and practical builders, and which place it almost alone among the various kinds of wall-lining. It is, however, its artistic merits as a wall decoration that have made it so successful. Every architect who has seen it will admit that it combines the toughness and weatherproof qualities of stamped leather, with the decorative relief obtained by the employment of tapestry or plaster. The sharpness and delicacy of the stamped ornament are not to be surpassed in any other material with which we are acquainted, and we may call attention of the profession to the pattern-book lately brought out by the Lincrusta-Walton Company, in which will be found numerous examples of surface and dado decoration, which faithfully exhibit the delicate precision and beauty of low relief characteristic of the material. In glancing over the designs, we find every conceivable form of decoration. The fluted dado (No. 120) is admirably suited for halls and corridors, and the more elaborate patterns, as the Japanese-panelled patterns, Nos. 129 and 132, are adapted for rooms. We find the makers have not confined themselves to one style, but have gone in for Late English Gothic (called Early English), Japanese, the Renaissance, and the Adams' styles. Nos. 129 and 130 are scarcely Japanese in spirit; but as designs for a well-covered wall surface or "filling" they are admirable. The dado for staircase has been made a special feature, as in No. 139, where the panels are disposed rectangularly, the filling-in of the triangular spaces left by the rake of the stairs being tastefully relieved by conventional forms and diapers in a Japanese style. The dado (No. 147) is another Japanese-panelled pattern, the foliage and birds being tastefully introduced upon a groundwork of simple diaper. We may also commend the panel No. 149. The patterns for "fillings" show a variety based on natural plants more or less conventionalised, and adapted for drawing-rooms, libraries, dining-rooms, and every kind of wall-decoration. The delicate flower, No. 121, the simple Gothic pattern, 122, the Renaissance design, 123, and No. 130 and 131 are pleasing adaptations of foliage for the purpose, avoiding the faults of over-elaboration and complexity. For libraries and bedrooms the patterns, No. 131, "Gothic Lily," and No. 133, "Rosette," are suitable as quiet and more conventionalised. In our opinion no style of ornamentation will develop the beauty and capabilities of Lincrusta more favourably than that known as the Adams. Besides these are plainer surfaces, as the Crèpe pattern, and the "Key," a neat diaper. The "Cupid" decoration and some of the friezes and borders are noticeable instances of low relief. No. 134-137 are intaglios; very effective borders are those numbered 144, 145. Panel patterns and mouldings are also shown. One great merit in the Lincrusta-Walton is that the relief can be reinforced by pleasing shades of colour inherent to the material. Four distinct colours are manufactured, from dark and reddish chocolate to an harmonious neutral tint of warm tone, and these are distinguished by letters, so that in ordering it is merely necessary to specify the letter corresponding to the index of self-colours. In fixing the Lincrusta, care is required in cutting the edges straight, but the instructions given will enable any workman to understand the operation. Glue and paste are used in the proportion of one-third of the former to two-thirds of the latter, and as thick as it is possible to use it, the mixture being laid on lightly with a stiff brush. For damp walls a specially-made varnish is supplied, with which the walls are covered in two coats, one being allowed to dry before the other is applied.

There are various uses of the material besides wall decoration. For book-binding it seems to be admirably fitted, and surpasses leather itself as a material for fine ornament. It can also be used with equal effect for ornamental cabinet work and panels, to chimney-pieces, and wherever, in fact, stamped leather has been used as a background for setting-off china, and bric-a-brac, &c. Its capacity for receiving fine ornamentation in relief would make it a useful substitute for ceilings where the delicate Wedgwood-like relief might be enhanced by the neutral tints of the material, or by painting and gilding. For public buildings, such as concert-halls, churches, banks, hotels, the combination of durability with its sanitary and artistic qualities seems to give it undoubted advantages, and will lead to its extended employment.

We notice, from a pamphlet which accompanies the pattern-book, that a considerable reduction has lately been made in the price of the material—never excessive, considering its advantages and its durability.

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ARCHÆOLOGICAL.

Ancient Babylonian Kings.—At a meeting of the members of the Society of Biblical Archæology, held on Tuesday night, at 9, Conduit-street, Regent-street (Dr. Samuel Birch presiding), a paper was read by Mr. Theo. G. Pinches, of the British Museum, on "A New List of Babylonian Kings, c. B.C. 1200 to 2000." This paper contained some remarks upon the place in the chronology of the East of certain Babylonian Kings whose names had lately been discovered, and which will help to fill up many gaps in the chronology and history of the country. The tablets upon which the names are recorded come mostly from the excavations carried on by M. Rassam's overseer upon the site of ancient Babylon. The principal tablet is of unbaked clay, very small in size, but in an almost perfect condition. The obverse, which contains the principal list, has the names of eleven Kings of Babylon, with the length of their reigns, and is a duplicate part of the tablet published by the late George Smith under the title of "Fragments of an Inscription giving part of the Chronology from which the Canon of Berosus was copied."

Dover.—St. Radigund's Abbey.—The excavations commenced last spring at St. Radigund's Abbey, which yielded such satisfactory results, are now being continued under the superintendence of Mr. R. Ussher, and during last week the foundations of the high altar were discovered. It stands at a distance of 14ft. from the east wall of the choir, and is 14ft. in length, being only 2ft. wide. The council of the Kent Archæological Society have made a satisfactory grant of money for the continuation of these works.

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ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

British Archæological Association.—The second meeting of the session was held on Wednesday last, Mr. Morgan, F.S.A., in the chair. Mr. Gordon M. Hills exhibited a large collection of Romano-British fragments of pottery, found at Manor Farm, Wanborough Plain, Wilts, where foundations of buildings have been met with, and others are believed to exist. Mr. Hills described the position, on the line of the 13th Iter of Antoninus, and suggested that it was the site of a lost Roman station, being where one may reasonably be supposed to exist, in relation to Spinæ, the next one on the line of road. Mr. Way exhibited some Roman coins, recently found at Exeter; and the Rev. Maude a large series of foreign silver coins. Mr. Butcher produced a fragment of Roman Samian ware from the Wall of London, now opened at the back of America-square; and the Chairman a perfect tile from the same place. It measures $17\frac{1}{2}$in. by $12\frac{3}{4}$in., and is 2in. thick. Mr. Loftus Brock, F.S.A., exhibited a drawing of the wall, and, after description of the discovery, pointed out its resemblance to the wall in the Tower of London, which was then described in a short paper. A vote of thanks was proposed, and carried unanimously, to Major-General Milman, C.B., Major of the Tower, H.M. Office of Works, and to Mr. J. Taylor, for their united efforts in having the fragment cleared for inspection, in response to the wishes of the Association. The Rev. Dr. Hooppell then described at length the very remarkable discoveries that have rewarded the exploration of the Roman station of Vinorium, the modern Binchester. This costly work has been undertaken by Mr. J. Proud, of Bishop's Auckland, under Dr. Hooppell's direction. The external walls have been traced, and found to have been built on an earlier British wall. The plinth is chamfered, similar to the wall in America-square. A paved road, 30ft. wide, extends through the station, and the walls of many private dwellings still remain, many of the doorways having bases of pillars in position. A large circular building was cleared out, and here and elsewhere the walls were found to be lined with hot-air flues of terra-cotta, kept in position by T-irons. Traces of reconstruction were found in every direction, and a mutilated statue of Flora was found serving as a support to some paving. The lecture was illustrated by a series of large coloured drawings, which gave a clear idea of these important and extensive discoveries. A large portion of the station remains to be opened out, although so much has been done.

Cambridge Antiquarian Society.—At the meeting of this society, held on Monday week, the president, Professor Hughes, F.S.A., gave the result of inquiries and excavations he had made along the line of Watt's Dyke and Offa's Dyke. He showed that the engineers of the dykes did not take advantage of the most easily defended points, but that they were carried in as straight a line as possible from north to south. In several cases no fosse had ever been made, and the steeper slope of the valley, and the fosse, where any existed, were on the west side. The ditches were, therefore, a boundary line, and not a defence. The only remains which had been found in them were Roman coins, and pottery, and an altar, and the whole evidence of age was most unsatisfactory. Dr. Churchill, Babington, said he believed the dykes were a boundary fence, and were also thrown up to prevent marauding by the dwellers on the west. He described the very similar earthworks in East Anglia known as the Devil's Ditch, Balsham Dyke, and Fleam Dyke, and said that they, too afforded a defence on the eastern side—in this case against the Mercians. The Rev. Dr. Hoopell showed a curved flint knife, 6in. long, a stone mace, the first found in England, and resembling a weapon used by the natives of New Guinea, and a bronze celt, all found in the fens, at Littleport, Cambs. The mace was a disc, having a sharp edge all round, and a hole drilled through the centre for the insertion of a wooden staff. Mr. W. White read a paper on the "Rubbish Pits" found in association with Roman remains, and which he endeavoured to prove were the receptacles of the débris of funeral pyres, and that the fragments of Samian ware almost invariably found in them were vessels broken after being offered to the gods, the brass coins also common being those placed in the mouths of corpses to pay the fare of Charon.

Edinburgh Architectural Association.—A meeting of this Association was held last week, the president, Mr. J. M'Lachlan, in the chair. Mr. R. Morham, city architect, read a paper on "Urban Amenity," in the course of which he discussed the desirability of there being some powers for the supervision of buildings given to the public authorities with regard to matters of taste, referring to various instances in which the amenity of towns and districts had been improved or spoiled by building operations. He alluded particularly to the want of architectural character in the great majority of the tenements of the humbler classes, which bulk so largely in the suburbs of most of our principal towns, and expressed his belief that the only hope of amelioration in this respect lay in improved education, and a greater interest being taken by the people generally in the architecture of their dwellings.

Liverpool Architectural Society. — The third meeting of this society was held at the Royal Institution, Colquitt-street, on Wednesday evening, December 1st. The president, Mr. C. Aldridge, F.R.I.B.A., in the chair, when a discussion took place with reference to "Some City Improvements." Mr. Wm. Parslow, F.R.I.B.A., in opening the discussion, explained that the subject would probably induce the belief that it was his intention to propose some grand general scheme for street improvements; but such was not the case—his thoughts were of much smaller matters. He had seen and heard of so many accidents arising from carelessness in hoisting goods into warehouses in crowded business thoroughfares, such as North John-street, that he thought the corporation should take some decided steps towards insisting upon proper protection being afforded the public. The next evil that suggested itself to him, as requiring consideration, was the danger to which wayfarers were subjected owing to there being no by-law compelling plumbers and slaters to provide against broken slates and other material falling from roofs under repair, and undoubtedly provision was necessary on all houses to prevent loose slates falling into the streets; there had been serious accidents recently from this cause, one ending fatally. There was great want of protection to life and property at the foot of Leece-street also, where there were accidents almost weekly from runaway horses, and last and not least there was no waiting-room and convenience accommodation for women in any part of the city. Men had been fairly well cared for in this respect, but women had been entirely neglected. He thought that this subject should be taken up by the corporation, and proper accommodation provided at different points, and if each were partly free and a small charge made for the use of the remainder, the income would cover the cost of the whole. In the course of the general discussion that followed it was stated that a new Building Act was being compiled by the Corporation Authorities, and the hope was expressed that the Society and the Master Builders' Association would be invited to send representatives to act on the committee, in whose hands the drafting of the Act lay, in order that the best information on all points might be obtained. It was suggested that the question of warehouse hoists and protection to the eaves of roofs might very well be dealt with in the new Act, together with the foundations of new buildings, with regard to which great laxity appeared to prevail with the authorities, instances being brought forward of large ponds in the outskirts of the city being entirely filled with refuse of the worst description, and houses being planted upon them directly the operation was completed. The president explained that in London all front walls were carried above the eaves to form parapets, which effectually prevented the fall of slates, &c., into the streets, and at the same time the gutters behind formed a safe means of escape from house to house in case of fires. Previously to the holding of the ordinary meeting there was a meeting of the class of design and construction in the small library, presided over by Mr. Aldridge, when 13 designs for a "Cemetery Chapel" were handed in by students, several exhibiting considerable merit.

Northern Architectural Association.—The new Session of the Northern Architectural Association was opened on Tuesday evening by an address from the President, Mr. Septimus Oswald, who took as his subject "Building Societies." He showed in consequence of an influx of capital into English hands there was a sudden immigration of population a few years since into our large towns, causing a sudden demand for houses. Rentals went up, and many houses were built and bought by those who had no capital except what was borrowed from building societies. An equally sudden exodus had lately taken place, and the fictitious rise in the value of house-property had been succeeded by a great depression, increased by the fact that new houses continued to be built, decreasing the value of those already in the market, and the earnings of building societies had greatly diminished. The root of the evil lay in the untrustworthy class of men appointed as "inspectors" of the building societies, who visited and examined properties offered as security or advances. Better and more prudent men should be employed, and the scale of "payments for valuations" should be enlarged so as to attract a higher class of valuer. But not only the property itself, but the circumstances and means of the borrower, should be taken into account in making an advance, and the permanent and prospective value of the property should also enter into the calculation.

Bradninch Church, Devon, has been much improved and partially restored in the course of the last few months. The tower-arch has been exposed to view by the pulling down of part of the west gallery. The organ has been removed to the north-east corner of the church. The west window has been filled with coloured glass from the firm of Hardman and Co., of Birmingham. The subject is "The Judgment Doom." In the former so-called restoration of 1842 the old porch was taken down, so that the only access to the church was by the tower entrance and by the chancel-door. This deficiency is now made good by the erection of a porch, under the superintendence of Messrs. Hayward, who have supplied the designs of the new choir seats.

The foundation-stone of new schools, in connection with Swan-hill Chapel, Shrewsbury, was laid last week. The schools are estimated to cost £550, and the plans are supplied by Mr. A. B. Deakin, of Shrewsbury. The builder is Mr. John Gethin.

CHIPS.

St. Andrew's Church, Sharrow, was reopened on Sunday, after decoration by Messrs. Powell Bros., of Leeds.

The enlargement of the Assize Courts of York is in rapid progress. The new building will be of Classical design, and encased externally with Whitby stone. Its cost will be between £3,000 and £4,000, and the whole improvements will probably be completed by June next. Mr. Charles Fisher, of Castlegate, York, is the architect.

The Finance Committee reported to the Court of Common Council on Thursday week adversely to a proposal that the Corporation should contribute to the Institute for the Advancement of Technical Education in the Metropolis, which is being promoted by the City Guilds. The Court, however, disapproved the Report, and resolved to make a grant of two thousand pounds per annum for a period not exceeding five years.

An exhibition is announced of appliances for heating, lighting, and ventilation. It is to be held at the Alexandra Palace, in the great central transept, and adjoining halls, and will be open from December 22 to January 11. Certificates are to be awarded under the adjudication of competent authorities.

The parish-church of Kidlington, which had been closed for some time, was reopened after restoration on Thursday fortnight. The work of restoration at the church, which consisted chiefly in renewing the roof of the nave and south aisle and the rebuilding of the aisle-wall, has been carried out by Messrs. Symm and Co., of Oxford. Mr. W. Wilkinson, of Oxford, was the architect.

A new wing of the Soldiers' Daughters' Home, at Hampstead, was opened on Friday. The "Boileau Wing" is Elizabethan in style, and provides laundry accommodation in the basement and a play-room on ground-floor. The architects were Messrs. J. and J. S. Edmeston, and the contractors Messrs. Lucas and Son.

Mr. Edward Cousins, who, for upwards of a quarter of a century, has held the office of borough engineer of Swansea, has, on account of failing health, tendered his resignation to the town council, asking that they should appoint him as consulting engineer only.

The inaugural lecture of Professor Gardner, who has been appointed successor to the Rev. Dr. Churchill Babington in the Disbrey chair of Archæology, is to be delivered at the Senate-house, Cambridge, on Thursday, the 3rd February next.

The Midland Railway Company are about to construct a loop line of railway between Holmes and Masborough, for mineral traffic. The permanent railway will, in accordance with the company's custom, be laid by their own servants, but contracts have been let for the building of a bridge over the Manchester and Sheffield Railway Company's Canal; that for ironwork has been taken by Messrs. Handyside and Co., of Derby, and that for masonry by Messrs. Chadwick and Co., of Masborough. The bridge will be 113ft. 6in. in span, and will be carried on girders 6ft. deep, supported on four caisson piles each 5ft. in diameter. The ironwork in the bridge will weigh 240 tons.

A stained-glass window has been placed in the south side of the chancel of St. Mary-le-Elms parish-church, Ipswich, in memory of the late Mrs. Walton Turner. It is a single-light, and has as subject "Purity," represented by a female figure holding a bunch of lilies of the valley. Mr. Taylor, of Berners-street, London, executed the window, and the mason's work was done by Messrs. Wigg and Wright, of Ipswich.

Mr. John Bowen, of Cambridge, has been elected city surveyor by the local board of Ely.

The north transept window in St. Nicholas' parish-church, Great Yarmouth, has just been filled with stained-glass, by Mr. Cornelius Harley Christmas, of that town, in commemoration of the attainment of his 86th year. The subject is "The Ascension," copied from a painting in the possession of the donor by Angelo Bronzini, a Florentine artist of the 16th century; and in order to provide unbroken space for the figure of Our Lord, the centre mullion has been removed from the window, and the tracery has also been rearranged. Messrs. Buckley, of Wigmore-street, London, W., carried out the work.

The vestry of St. Pancras elected on the 1st inst. as assistant surveyors, Messrs. Alaway and Hawtrey, from amongst a large number of candidates.

The first line of the fifth paragraph in the second column, p. 663, last issue, respecting the announcement of the Building Exhibition, in April next, should have read "The Building Exhibition *held* in April last." Mr. Black's address (where all applications for space, &c., are to be made) is 161, not 162, Strand.

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ILLUSTRATIONS.

GARDEN CORNER, CHELSEA.—DESIGN FOR A COFFEE-TAVERN.—NEW BOROUGH ASYLUM, HULL.—REREDOS AND RETURN STALLS AT ST. ALBAN'S CATHEDRAL.

OUR LITHOGRAPHIC ILLUSTRATIONS.

GARDEN CORNER HOUSE, CHELSEA EMBANKMENT.

This house is situated at the S.W. corner of the Physic Gardens on the Chelsea Embankment. The front and flank walls are faced with dark red bricks, the roofs are covered with Broseley tiles and Cooper's ridge tiles. The house has a frontage of about 45ft., and contains the following accommodation:—In the basement, kitchen, scullery, servant's and butler's pantry, 2 bedrooms, wine and beer cellars, w.c., and store and glass closets. On the ground-floor there are a dining-room, morning-room, and library. On the first floor, music-room, drawing-room, and billiard-room. On the remaining floors are bed and bath-rooms, with linen-closets, cistern-room, and other domestic offices. The principal staircase is of oak with carved brackets to stairs, and carved newels. The walls and ceiling of the music-room are of panelled oak, the walls being relieved with tapestry and painting, the floor being oak parquet. The architects are Messrs. I'Anson and Son, of 7A, Laurence Pountney-hill, London; and the builders, Messrs. Macey and Sons, Milford Works, Battersea. All the wood fittings of the music-room were executed by Messrs. Howard, of Berners-street.

THE ARCHITECTURAL ASSOCIATION MEDAL—DESIGN FOR A COFFEE TAVERN.

We illustrate this week some of the successful drawings in this competition, a criticism of which appeared in our issue of the 5th ult. The site, a corner one, was stipulated to be situated in a populous district in London, and the building was to meet the requirements of the Metropolitan Building Act. The chief object in the ground-floor was to provide a spacious bar with a large eating-room attached, which could be administered with ease and privacy from the serving-room. This was a matter of some difficulty, as the smallness of the site did not admit of a second staircase. The first-floor plan is rather crowded, but fulfils the conditions, and it would have been better if the space taken up by the chess-room had been divided between the club and billiard-rooms. The second-floor plan was, according to the instructions, to be used altogether by the reading-room and secretary's-room, but space could have been well spared on this floor for the chess-room. The third-floor is used by the caretaker, and the kitchen, scullery, and other offices are in the basement. It has been a primary consideration to well light and ventilate all the rooms and conveniences. The author of the design is Mr. Edwin M. B. Vaughan, architect, of Cardiff.

HULL ASYLUM.

The buildings inclose a double square, furnishing on either side a roomy airing-ground for the more troublesome of the patients. The central portion runs from south to north in the following order:—The southern central position is occupied by the amusement and dining-hall, which projects in front of the rest of the asylum. Next comes the kitchen divided by a corridor from the dining-hall and sculleries, together with the bakery, flour stores, general grocery stores, vegetable and potato-room, larder and dairy. Over the larder and dairy, &c., are the bedrooms for the cook, kitchen-maids, housemaids, and the patients employed in the kitchen. On either side of the kitchen run the connecting corridors, through which the patients pass to the dining and recreation hall. The attendants' mess-rooms open into these, one for each division, and are conveniently placed in close proximity to the kitchen, with the cook's room adjoining. Next in the middle line we come to a suite of rooms comprising the surgery and patients' visiting-rooms. These, with the kitchen and corridors, inclose a square in which stands the detached meat-larder. A subway opens also into square, and allows the meat, vegetables, coal, and other provisions to be readily brought to the kitchen and general stores. Finally, we have the block which contains the general stores, the clerk's office and sitting-room, the porter's-room, general waiting-room, committee-room, and superintendent's-office. Over these are placed the clerks' bed-rooms, two spare bed-rooms, the chaplain's-room, library and porter's bedroom, &c. The infirmary blocks are two-storied blocks, and are somewhat after the plan of the new infirmary blocks in the Durham County Asylum, which were highly commended by the Lunacy Commissioners. The floors provide all necessary accommodation for patients, including a central day-room with four small dormitories, six single rooms, two attendant's-rooms, a kitchen and scullery, and a small visiting-room on each floor, where those patients who are too infirm to be taken to the general visiting-room may see their friends. The importance of a kitchen for the infirmary is now generally admitted. It allows the serving of beef-tea and all extra diet to be easily accomplished at any time of the day or night, and contributes immensely to the comfort of the sick and infirm. The bath-room, lavatory, and water-closets are in a detached building on the north side of the infirmary with a lobby which admits of cross ventilation. The block for violent and troublesome patients is placed on the outer side of the square, and consists of a large day-room with two adjacent corridors, which can be closed by glass doors, and used as separate day-rooms if necessary. In connection with this ward are twelve single rooms and two attendants' rooms. The store-rooms, closets, urinals, and lavatory are in a detached block, with gallery for cross ventilation. This ward provides accommodation for some of the more violent of the epileptic class. The arrangement is the same for both sexes. The blocks for chronic and working patients have on the ground-floor three large day-rooms, opening one into the other, together with a spacious lavatory and boot-room, stores, and attendant's-rooms. The general bath-room is closely adjoining, and with its roomy dressing-room is so placed as to serve for both these and the preceding blocks. The water-closets are detached as in the other blocks, with cross ventilation between them and the day-room. On the first floor are the dormitories, lavatory, a single bath, store-rooms, and attendant's rooms. The blocks for recent cases are built out in front of the connecting corridors, so as to enjoy a southern aspect and to leave the corridor free for traffic, and to avoid what the architects consider the worst feature of some modern asylums, viz., a subway or covered way. They consist of a suite of rooms on the ground-floor, a day-room, dining-room, and dormitory, seven single rooms, and two attendants' rooms, a scullery, stove and bath-rooms. The lavatory and water-closets are detached as in the other blocks. On the first floor are the epileptic and suicidal dormitories, single rooms, attendants' rooms, lavatory and closet. They are designed in strict accordance with the Lunacy Commissioners' suggestions. It will be seen that no special day-room accommodation has been set apart for the epileptic patients, the architects' medical advisers being of opinion that it is better on the whole (especially in a small asylum) to divide the epileptic population over the general wards according to their peculiar dispositions. The violent would, therefore, be placed in the ward for the more troublesome, the quiet and well-behaved in the working block, the feeble in the infirmary. The general dining-hall, recreation-hall, and attendants' messrooms are placed where they alone ought to be: near to the kitchen and sculleries, thus ensuring due supervision by the housekeeper, and adding immensely to the comfort of the patients and attendants by facilitating the serving of the food whilst it is hot. The assistant medical officer's rooms are placed near to the reception-wards where the cases requiring most supervision are under treatment. The head attendant's rooms are centrally situated, being near the dining-hall and mess-rooms, and in the neighbourhood of the infirmary blocks. The medical superintendent's house is near the south-west angle of the building, being connected to the female side near the infirmary by a short corridor. The church is some little distance in front of the recreation-hall. Most of the wards are provided with verandahs for air and exercise without exposure; this feature is especially useful in the infirmaries and receiving wards. The laundry is situated on the north side of the corridor, near the female working and receiving blocks. It is capable for washing for 400 people, and is fitted with washing and ironing-rooms, sorting-rooms, foul laundry, with separate approach, male and female receiving and delivering-rooms, and drying closets, &c., and is to be fitted up by Messrs. Bradford and Co., of Manchester. The exhaust and steam from the engine will be used for heating the drying closets and hot-water circulation to day-rooms, single rooms, and corridors, and the condense from the same will be used for the boiler feed, thereby effecting an economy in fuel, and reducing the deposit in the boiler. The shaft for boiler has a ventilating flue at sides for drying-closet. A thorough system of ventilation is arranged, the rarefying power being supplied from the boiler and kitchen chimneys, and tubes are taken into the various rooms, fresh air being admitted by means of vertical tubes, the air in the winter passing over the hot-water pipes. Messrs. G. Jackson and Son, of Hull, are the general contractors, and the other contracts have been taken by Messrs. Haden and Sons for the general engineering, Messrs. Benham and Son for the kitchen fittings and stoves, Messrs. Bradford will fit up the laundry, Messrs. Porter and Co., of Lincoln, the gasworks. The architects are Messrs. Smith and Brodrick, of Hull (assisted by Dr. Wallis, the medical superintendent of the county asylum, at Whittingham, in the original arrangement of the plans), who obtained the work in competition, their plans being selected by a referee appointed by the magistrates on the recommendation of the Lunacy Commissioners. The cost is about £50,000.

REREDOS AND RETURN STALLS AT ST. ALBAN'S CATHEDRAL.

The Reredos for the Lady Chapel is to be the gift of the Freemasons of England; it will be made by Mr. Miskin, of St. Alban's, the carving being done by Mr. Briudley. There is just now some doubt as to the future use of the Lady Chapel which delays the order being given for its execution. The return stalls are to be erected as a memorial to the late Archdeacon Mildmay. It is hoped that those forming the sides of the choir may be presented by individuals; their cost will be £100 each. At present only the return stalls with the central entrance have been ordered. The work is being carried out by Mr. Brindley. All are from the designs of Mr. John O. Scott.

◆

The alterations and improvements that have been in progress in the church of St. Edmund the King and Martyr and St. Nicholas Acons, Lombard-street, for some months past, under the superintendence of Mr. Butterfield, are now being completed, and the church will be reopened for divine service on Christmas Eve. The organ is being enlarged, and many improvements added to it, under the supervision of Professor Monk, of King's College.

The town council of Newbury, at a special meeting, have unanimously resolved to offer premiums of £100 for the best and £50 for the second best plan for the drainage of the borough and the disposal of the sewage. A resolution was also passed pledging the authority to prepare a drainage scheme, and submit the same to the Local Government Board before March 31st.

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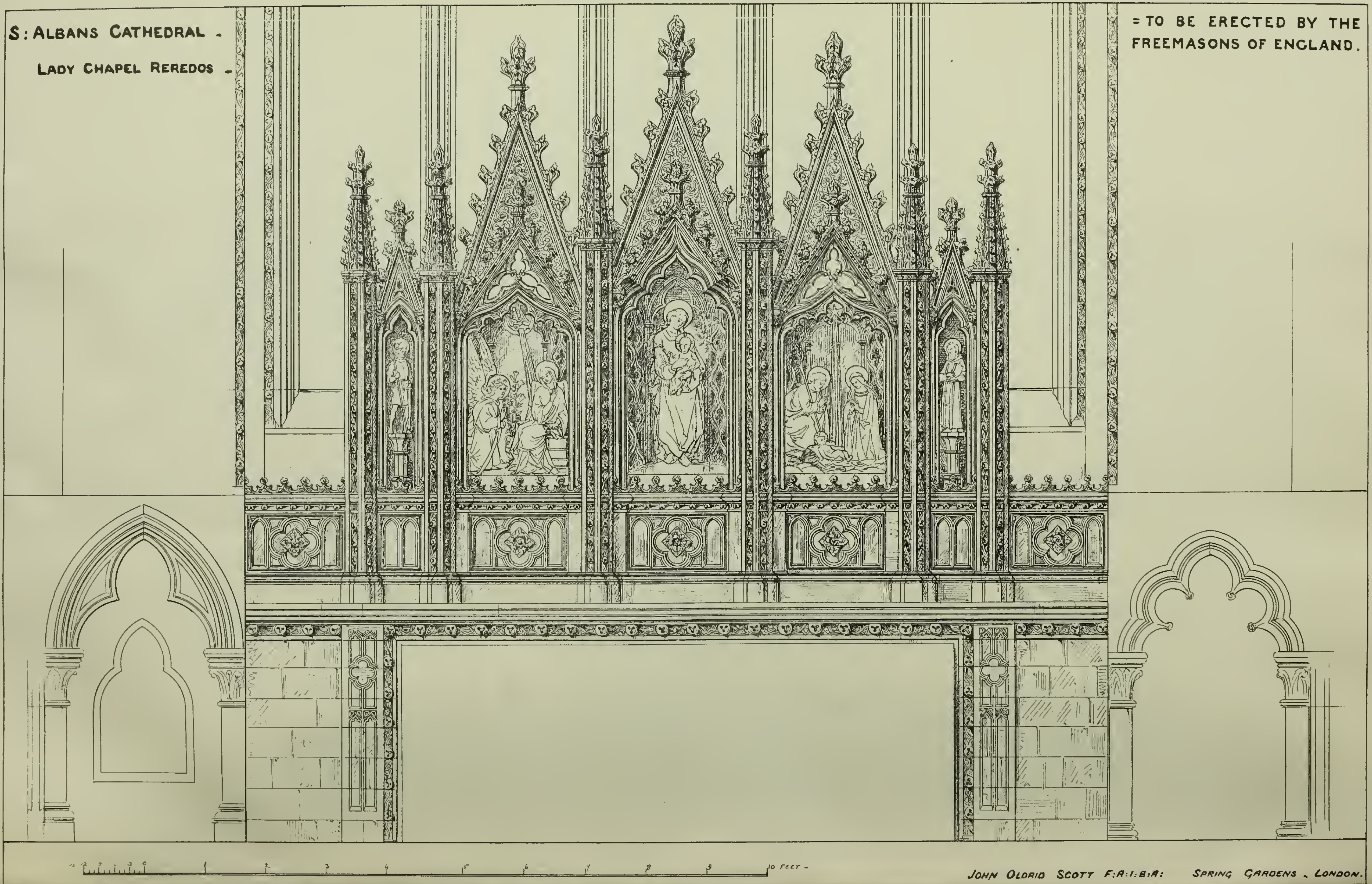
THE BUILDING NEWS, DEC. 10. 1880.

S: ALBANS CATHEDRAL -

LADY CHAPEL REREDOS -

= TO BE ERECTED BY THE FREEMASONS OF ENGLAND.



JOHN OLDRID SCOTT F:R:I:B:A: SPRING GARDENS - LONDON.

DESIGN FOR THE NEW STALLS

S : ALBANS : CATHEDRAL :

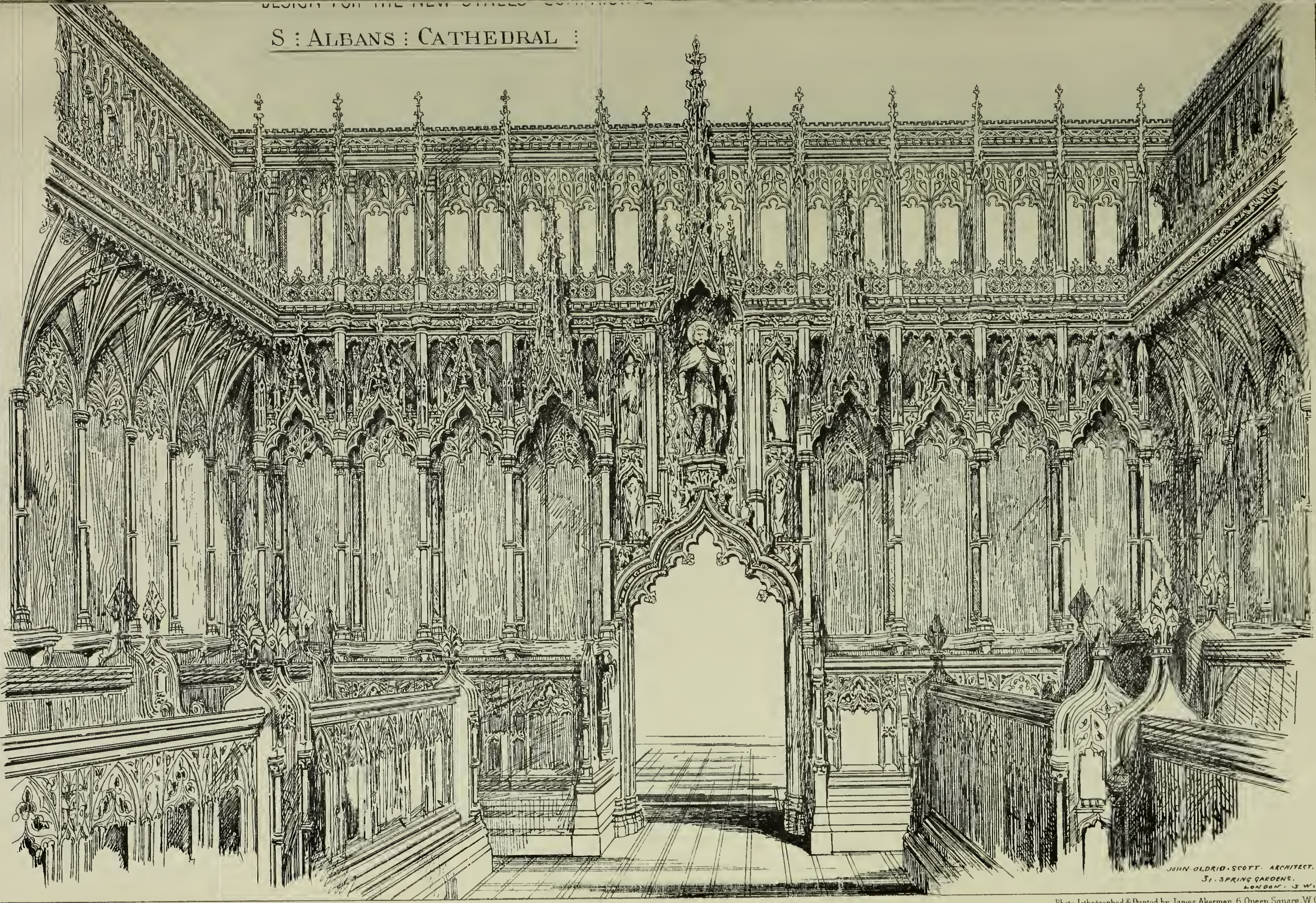
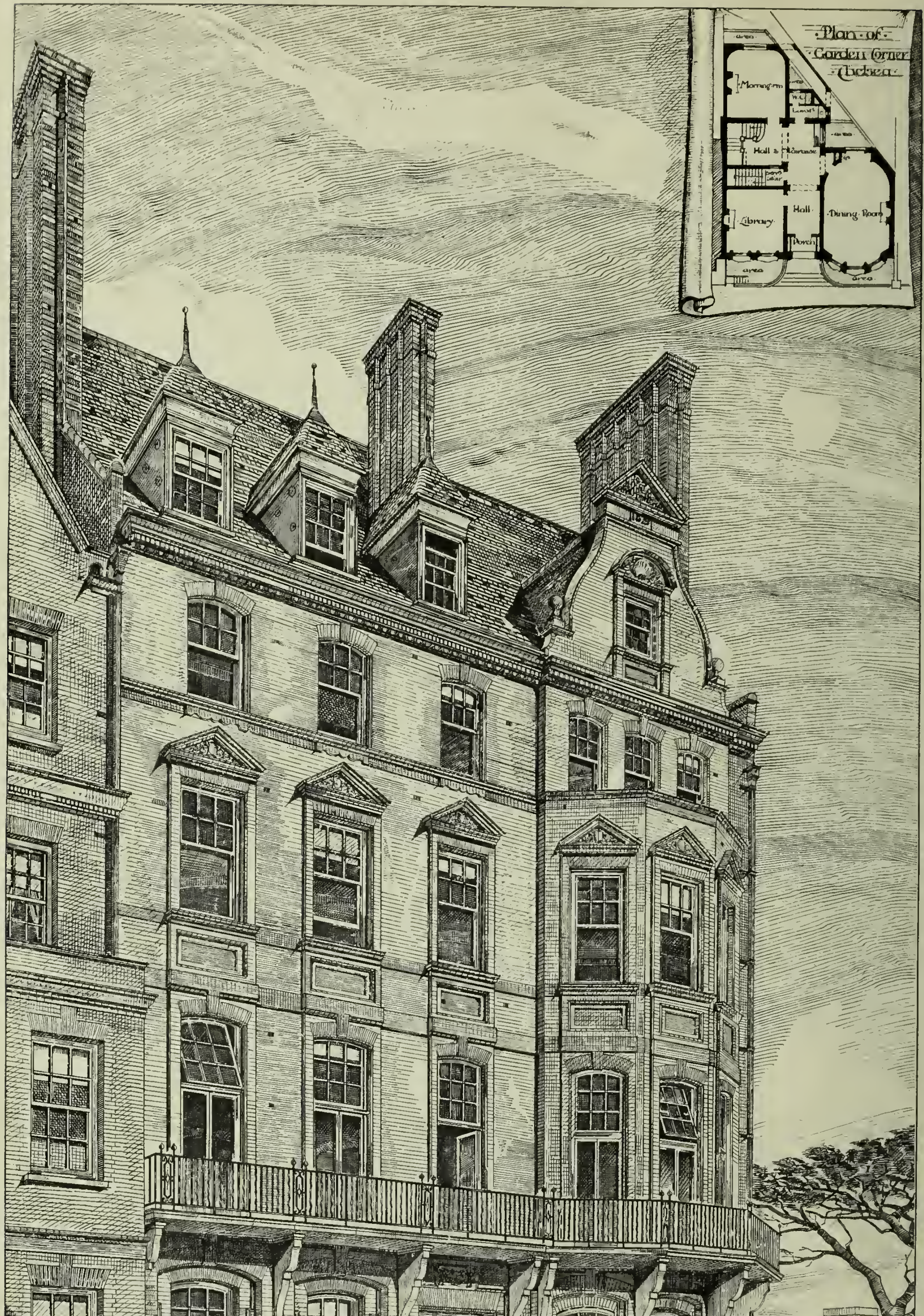


Photo-Lithographed & Printed by James Akerman, 6, Queen Square, W.C.



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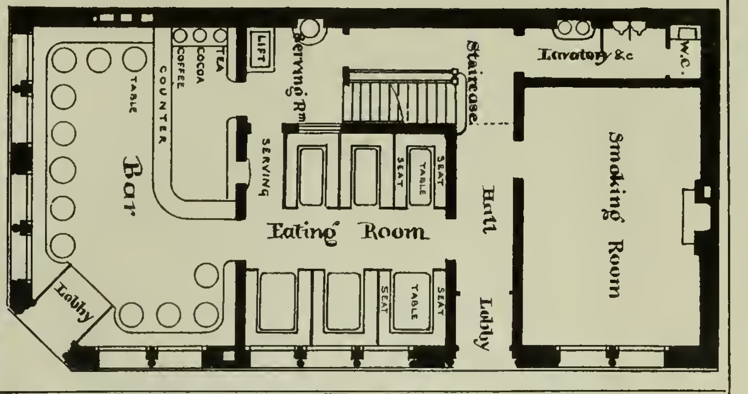
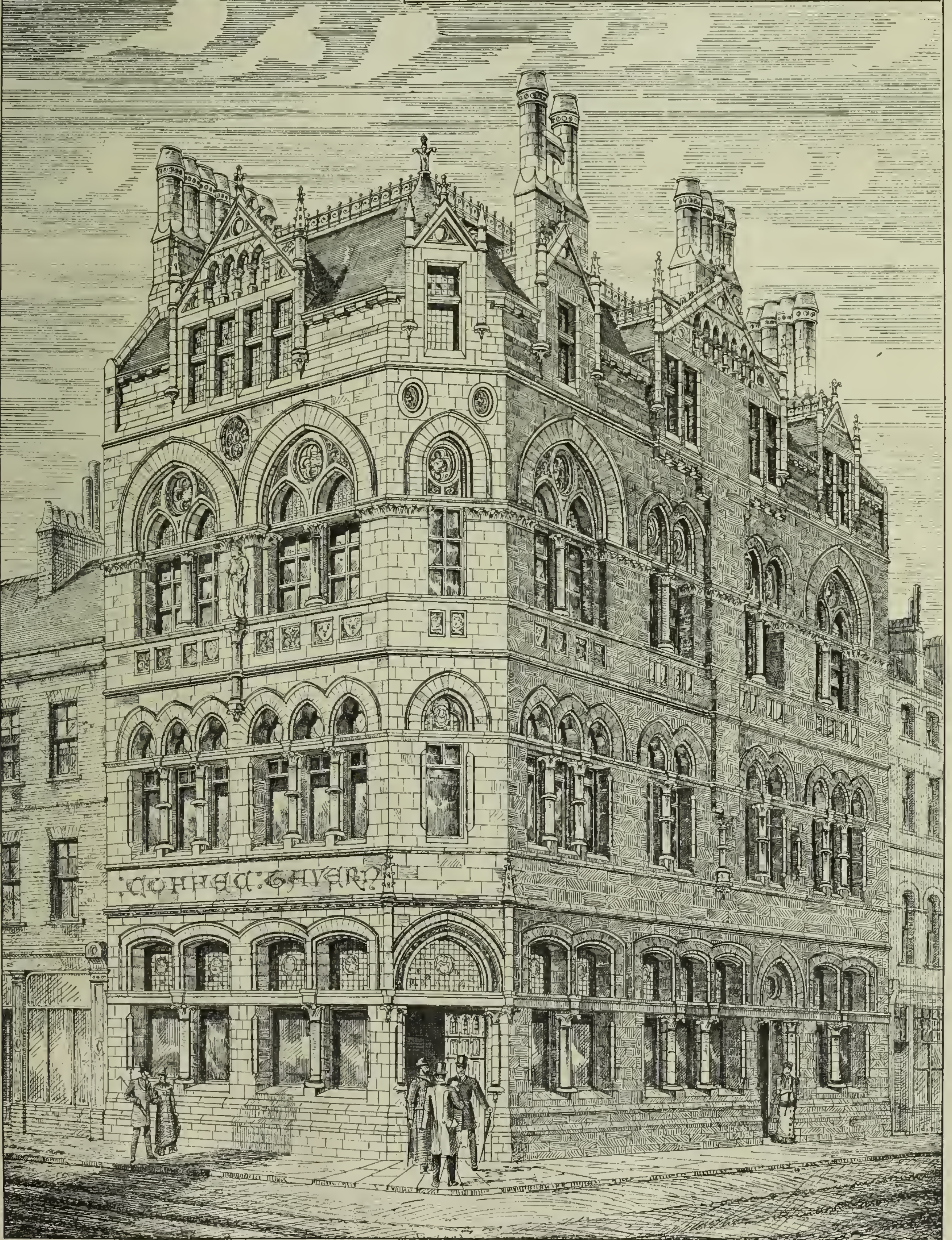
"GARDEN CORNER" CHELSEA   E. BLAKELEY I'ANSON ARCHITECT.

DESIGN FOR A COFFEE TAVERN

ARCHITECTURAL ASSOCIATION MEDAL PRIZE

AWARDED TO E. M. B. VAUGAN CARDIFF.





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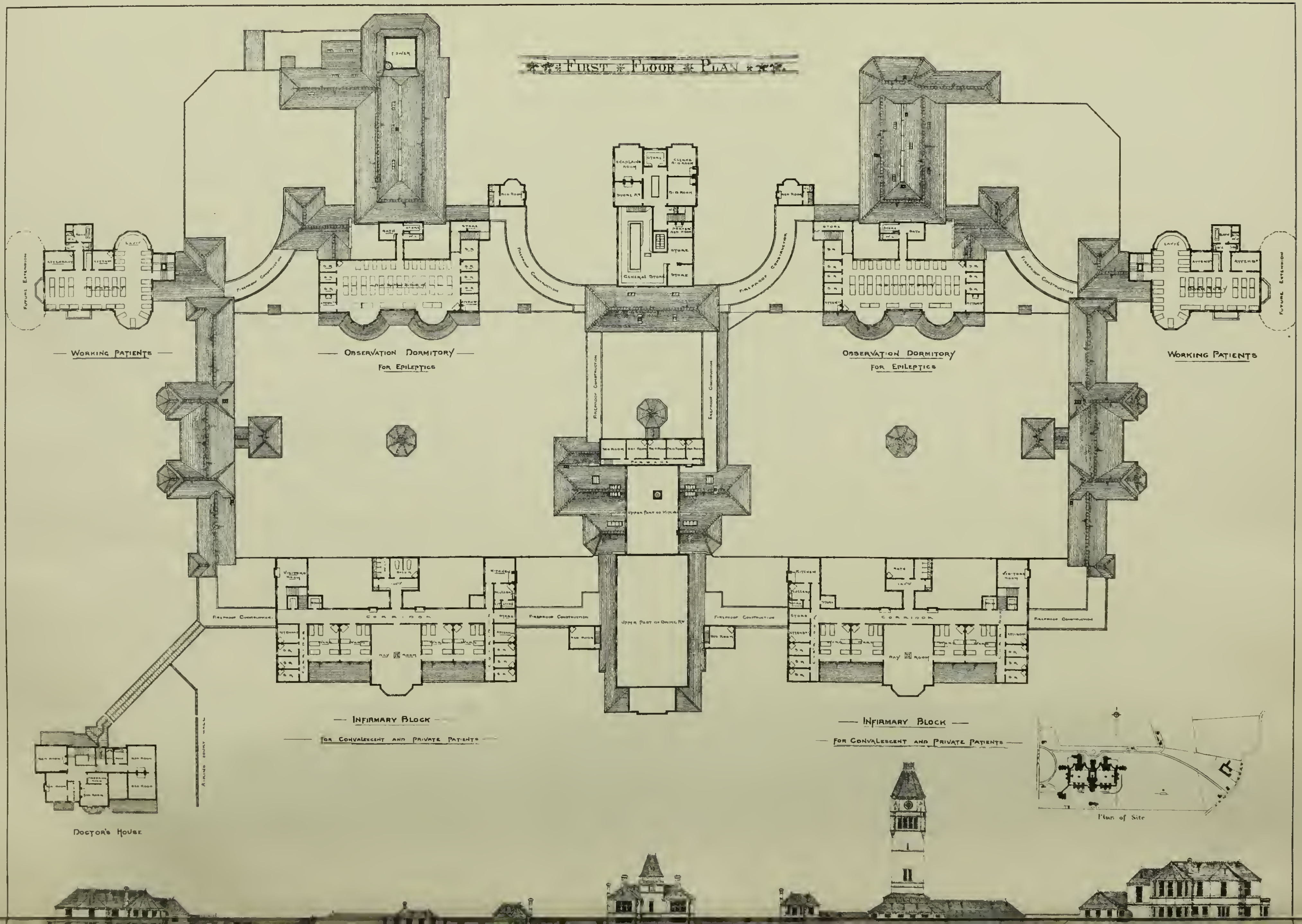
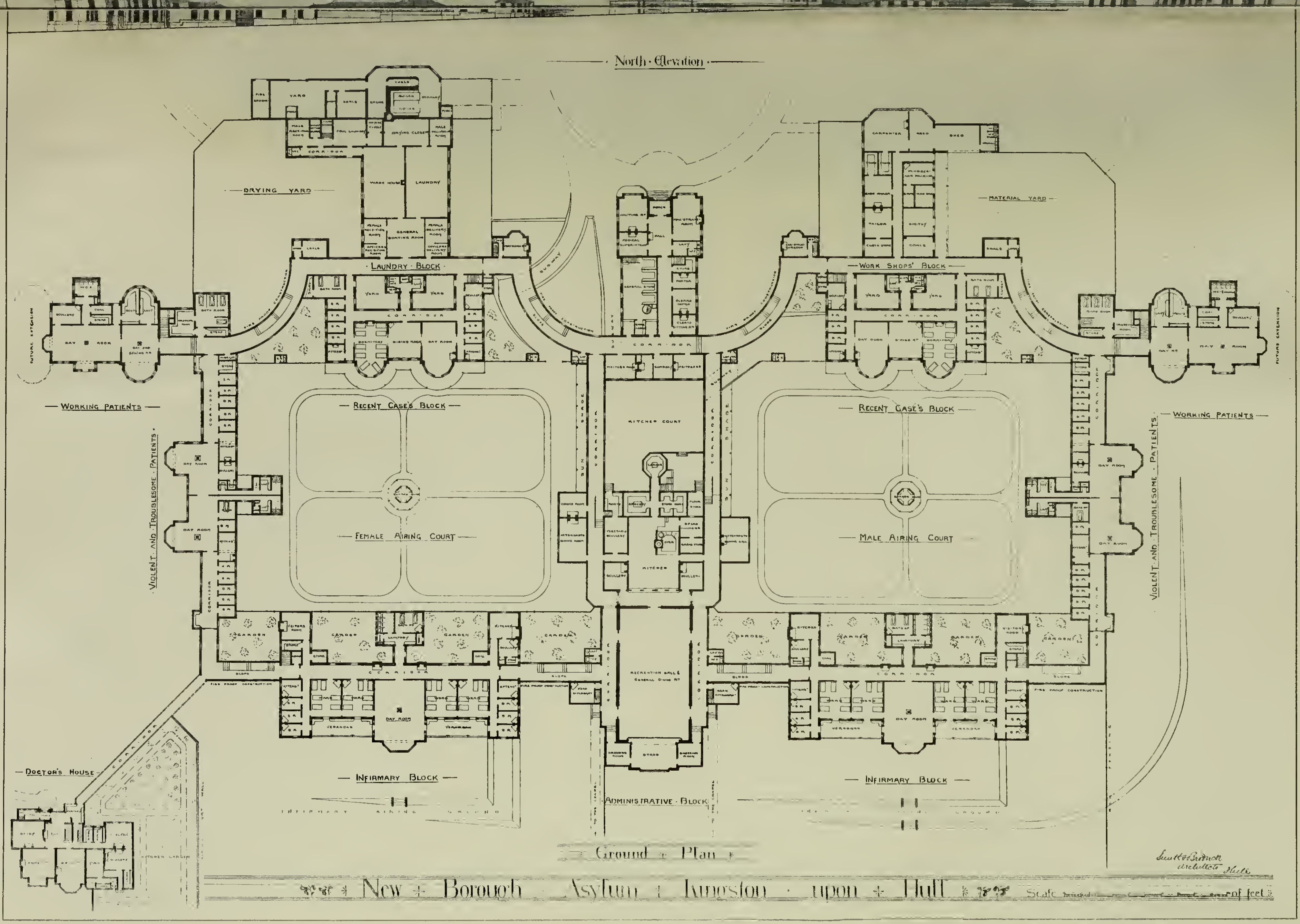
THE BUILDING NEWS, DEC. 10. 1880.





Ground Plan

New Borough Asylum Kingston upon Hull

Scale of feet

Smith & Brodrick
Architects Hull

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COMPETITIONS.

Bristol Trade School Competitions.—Plans have been received for the erection of the new Trade School at Bristol for the Society of Merchant Venturers. This is the competition in connection with which the idea was conceived of making the competing architects pay a guinea each, which was not to be returned (for particulars see Building News of Sept. 3, p. 287). We have applied, as usual, for information, and to know if the designs are on view, and have been favoured with the following communication :—

TRADE SCHOOL, BRISTOL.

> Sir,—Strangers will not be admitted to view these plans. No doubt the successful competitor will publish his success as soon as the award is made.—Yours truly,
>
> George H. Pape.
>
> Bristol, 7th Dec., 1880.

We should like to know how many architects have helped to pay the £100 premium which is to be paid to the successful competitor.

Burton-on-Trent Market Hall.—At the meeting of the town council, held on Wednesday week, a report from a committee was read, stating that the design distinguished as "No. 8" appeared satisfactory, and could, in their opinion, be carried out for £8,000, and they recommended it for the premium. Alderman Yeomans, in bringing up the report, stated that it had since been ascertained that the author of design No. 8 was a young man at Birmingham, who had written declining to undertake the carrying-out of the work; and the committee thought that if the council gave the author the 60 guineas premium, they would find great difficulty in inducing another architect to carry it into execution. The town clerk then read a report by Messrs. Evans and Jolly, of Burton and Nottingham, which stated that in their opinion No. 8 design would cost about £11,000, No. 16 about £10,500, and No. 5 about £9,000, all exclusive of foundations, which in Burton would probably be a considerable expense. After some discussion, the question was referred back for reconsideration.

Burton-on-Trent Workhouse.—The board of guardians received, at their last meeting, a comprehensive report from the building committee, with reference to the erection of a new workhouse, in which they recommended the building of premises to accommodate 500 inmates, besides officers, in separate blocks or pavilions, with an administrative block in the centre, between the male and female wards; and that the infirmary and schools be separate buildings. Out of 82 applications from architects who were wi[illegible] to prepare plans, the committee recom[illegible] the following four as most eligible:—[illegible] S. Nelson, Leeds, who had erected [illegible]arfdale and Brampton workhouses; Messrs. Wilson, Son, and Aldwinkle, London, who had [illegible]ed Lambeth workhouse, and carried out [illegible]ions to that of St. George's-in-the-East; [illegible] H. Morton, South Shields, who had erected South Shields and Hexham workhouses; and Messrs. Giles and Brookhouse, Derby, who had erected the workhouse in that town. The committee further recommended that the architect appointed be paid at the rate of 4½ per cent. The board adopted the report in its entirety, with the exception that only two of the four architects suggested—Messrs. Wilson, Son, and Aldwinkle and Mr. J. H. Morton—were invited to send in plans in competition, a strong feeling being expressed in favour of the block system on which Lambeth and South Shields workhouses had been severally built by these architects.

Dou[illegible]las, Isle of Man, Board Schools.—In an [illegible] competition, to which 50 architects re[illegible], for the erection of a mixed school to [illegible]ate 600 children, the plans under [illegible]mplex," submitted by Messrs. [illegible] and Cheers, of Harrington-street Liverpool, and Queen Victoria-street, London, were selected, who have been appointed architects to the committee.

Tipton Gas-Works.—In June last the Tipton local board invited designs for a gas-works to provide for an annual consumption of 60,000,000 cubic fee[illegible] The awards have now been made, Mr. P[illegible] of Burham, obtaining the first premi[illegible] £100, and Messrs. Bromilow and Cheers, [illegible]5, Queen Victoria-street, London, and 21, H[illegible]ngton-street, Liverpool, the second of £50.

Wesley[illegible] Middle-Class School, Truro.—In this competition, in which designs were to include provision for 100 boarders, master's house, school, class-rooms, &c., the plans submitted by Mr. Etwell, of Birmingham, were finally selected, and those by Messrs. Bromilow and Cheers, of Liverpool and London, obtained the second premium.

Building Intelligence.

Cardiff. — Clifton Calvinistic Methodist Chapel, Newport-road, Cardiff, was publicly opened on Saturday. It has been built at a cost of £3,500, and seats 550 persons; the internal dimensions being 58ft. by 40ft. 6in.; 22ft. high to springing of roof, and 35ft. 6in. to the centre of ceiling. The building is Early Decorated in style, and has a tower and spire 99ft. in height at the principal angle of the building over the staircase to gallery. The materials are Newbridge-stone, hammer-polled, with dressings, and the whole of spire, in Bath-stone; and the roofing is of bands of Bangor and Portmadoc slates. The internal woodwork is of pitch-pine, stained and varnished, including the roof, which is open for two-thirds its height and ceiled and boarded, the rostrum, and Communion-table, and the pews. The windows are glazed with cathedral-glass, the gable-window having margins of coloured glass. Messrs. W. G. Habershon and Fawckner, of London, Newport, and Cardiff, were the architects, and Messrs. S. and A. Lewis, of Roath, Cardiff, the contractors; the ironwork, including pillars, gallery-front, grill, and boundary-fencing, was cast by Messrs. Baker, of Newport.

Fletching, Sussex.—The parish-church was reopened on St. Andrew's Day, after complete restoration, effected at a cost exceeding £6,000, solely borne by the Earl of Sheffield. The chancel-roof has been rebuilt in oak, and the east window restored, part of the former masonry having been found buried in the church. A new Communion-table, in marble, has been erected, with steps of Plymouth marble, black, having broad veins of white; the new reredos is of black and Siena marble, with an upper arcade of alabaster. The piscina has been restored, and new sedilia erected. New chancel-stalls of carved oak have been erected, and the chancel-screen has been restored, and a Gothic canopy in oak added, on the lines of the former structure. An organ has been built by Messrs. Forster and Andrews, of Hull, at a cost of £700. The roof of the nave has been reconstructed, the clerestory windows again opened out, and new lean-to roofs placed upon the aisles. The nave, transept, and aisles have been paved with glazed tiles, specially made in dark-blue, green, and yellow, and other colours, with borders and inlays of encaustic tiles. All the windows have been reglazed with cathedral glass and tinted borders, and the church has been reseated with benches in English oak. The old carved oak pulpit has been set upon a stone base, a new eagle lectern in brass erected, and the old font has been replaced by another in Portland stone, designed by the architect. The doors are all of new English oak, with elaborate scroll ironwork. A new vestry has also been built. Mr. Jno. Oldrid Scott was the architect, and Messrs. Cheeseman, of Uckfield, were the builders.

Frimley.—The parish-church of Frimley, an edifice erected at the dawn of the Gothic revival, was reopened on the 2nd inst., by the Bishop of Winchester, after restoration. A new reredos has been erected, having an arcade of Caen stone supported on columns of Devonshire marble, and enclosing panels carved with the cross, vine, and corn, by Mr. Boulton, of Cheltenham. The chancel has been paved with Minton's tiles, and a chancel-arch built, carried on columns of Devonshire marble. The east window has been replaced by one of three lights, filled with stained glass by Messrs. Powell, of London, the subjects being figures of Our Lord, St. Peter, and St. Paul. The plaster ceiling, which inclosed the whole area of the church (a parallelogram on plan), has been replaced by a boarded roof in which the tie-beams are exposed. The square box-pews have been removed to make way for benches of yellow deal, stained and varnished, and the new choir-stalls, pulpit, and reading-desk are of oak. The galleries have been cut back, the seats rearranged, and a new arcaded front erected. Mr. T. Goodchild, of the Adelphi, London, was the architect, and Mr. J. Harris, of Woking, the builder. The cost has been about £1,250.

Huddersfield.—Holy Trinity Church has been undergoing alterations, and was reopened on Dec. 6. The alterations include the reseating of the nave with polished pitch-pine open benches, giving accommodation for 552 persons. The nave, aisle, and chancel-floor have been laid with tiles by Messrs. Minton, Hollins, and Co., of Stoke-upon-Trent. New oak stalls, precentor's desk, and reading-desk, with richly-carved front, book-boards, and ornamental stall ends have been put in. The pulpit, communion-rails, and reredos have been restored and readjusted. The north vestry has been raised and opened out to the church, with arched openings to north aisle and chancel, for the accommodation of the organ. The restorations have been designed and carried out by Messrs. John Kirk and Son, architects, Huddersfield and Dewsbury.

Mells.—The parish-church of St. Andrew, Mells, Somerset, was reopened on the 30th ult. It is a 15th-century structure, consisting of chancel and nave, with aisles to both, tower, vestry, and south porch. In the nave new floors have been laid, of wooden herring-boned blocks under the seats, and of Minton's tiles in the passages. The plaster has been removed from the walls, which have been pointed. The church is lighted artificially by two chandeliers, and by lamps with duplex burners, the former supplied by Messrs. Singer amd Son, Frome, the latter by Messrs. Hart, Son, and Peard, of London. A new pulpit of Bath stone, with Portland stone steps, has been erected, and also a new chancel-screen, Perpendicular in style, richly carved in oak. In the chancel the walls have been refaced with local ashlar, and the corbels supporting the roof principals have been carved with figures of angels. A new reredos has been erected in Doulting stone, with Devonshire marble columns dividing it into panels, which contain carved representations of the Entry into Jerusalem, Christ bearing the Cross, and the Crucifixion. The choir desks and stalls are carved in oak, the floor has been relaid with Minton's tiles. A new organ, built by Mr. Voules, of Bristol, has been erected, at a cost of £330; the organ-case is of oak, and the pipes have been decorated by Messrs. Grant, Bros., of Frome. The architect was Mr. Henry Woodyer, of Gratham, near Guildford, and the contractors were Messrs. Brown, of Frome; the clerk of works was Mr. Finnell, who also carved the pulpit, the corbels, and other work. The reredos carving was by Mr. Nicholls, of Lambeth, and that of the screen by Mr. Thos. Stillman, of Bath.

Needwood.—Christ Church, Needwood, commonly called the Forest Church, was reopened for Divine service on Advent Sunday, after having been closed since the middle of May. The old pews and benches have been all removed, and have been replaced by pitch-pine seats. The stone flooring, which was much decayed and broken, has been replaced by a flooring of Minton's tiles, with a through system of ventilation under it; new wooden platforms have been placed under the seats, the old windows have been taken out, and new stonework of a Gothic pattern has been inserted in them. The organ has been removed from the south-west to the north-eastern angle of the building, a new prayer-desk and lectern have been set up, the pulpit has been lowered and embellished, a new oak altar-rail has been substituted for the former metal unecclesiastical one, the inside of the building has been recoloured and the woodwork repainted, and altogether the church may be said to be greatly beautified and improved. These works have been carried out by Mr. H. Stevenson, builder, of Burton-on-Trent, from designs by Messrs. Evans and Jolley, architects, of Nottingham and Burton-on-Trent.

* * *

At the meeting, last week, of the Clerkenwell vestry, a recommendation from a committee was received that the salary of the surveyor about to be appointed commence at £200 per annum, and that a resolution passed in July, 1875, fixing the salary at £300, be rescinded. To this an amendment was moved that the salary commence at £250 a year. It having been stated that £200 was inadequate to the responsibilities of so large a parish as Clerkenwell, the amendment was carried unanimously.

The new buildings of the textile and dyeing departments of the Yorkshire College, at Leeds, were opened on Friday last.

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

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Received.—J. W. and Son.—D. and Co.—P. and F.—E. S. and Co.—S. L.—J. M.—W. T.—L. and N.W. Ry. Co.

Queen Anne, Leeds. (Letter inserted. An inclosure came therewith, which must have been sent in mistake. Please send address that we may return it.)—J. P. (We fear there is little doubt that some committees do act in the manner you describe, and that some architects are contented to avail themselves of the badly requited labour of their professional brethren. With such a clause in the conditions as you quote, there is no doubt all the premiated designs are the property of the committee.)—School of Art. (You can get them through your local master, or from the Secretary of the Science and Art Department, South Kensington.)—An Old Subscriber. (No.)

Drawings Received.—T. Mitchell, W. Scott, M.; S. C., Junr.; A. G., W. C., Geo. Baines, Jos. F. W., Henry L. Gay, Chicago, Ill.; E. E. H.

"BUILDING NEWS" DESIGNING CLUB.

Will. (Your long letter about so trifling a matter must be a joke. We suggested the dimensions of the studio, but to disqualify a well-planned design for an excess of a foot or a few inches is too absurd. If you had any competition experience you would not have made so trivial an objection.)

Correspondence.

THE FUTURE OF CEMENT.

To the Editor of the Building News.

Sir,—The "future of cement" foreshadowed in your leading article in the number of the 26th ult. is not calculated to inspire confidence in those sanguine and advanced intelligences who have accepted Portland cement and its various outcomes, as rendered from time to time in your valuable journal. I never expected to see, in your columns, such a dogma propounded as that having reference to the quality of mortar joints, upon which subject you say: "Regarding the structural conditions of a wall, it does not appear to us any economy to require that the mortar joints should be of greater strength than the bricks themselves, as in that case there would be no advantage gained." To accept such teaching would be, to my mind, the lowering to one common level the "jerry builder" and conscientious constructor, for the former would, on being challenged as to the quality of his mortar, maintain that it was as good as his bricks. I am afraid that your position on this question is untenable, if you insist upon such a comparison being the basis of estimating the value of mortar; but I am glad to think that even your influence will not disturb the healthy and advancing desire to reach perfection of mortar, regardless of the quality of material it is intended to bind together. The past and present exertions of practical investigators of Portland cement and its properties of useful combination with various aggregates for mortar and concrete has rapidly advanced the reputation of this important constructive material to a position far in advance of any serious danger likely to arise from the circulation of opinions which you will pardon me for characterising as retrogressive in character.

Perhaps the review was unavoidably lowered to the level of Mr. Redgrave's paper, which may be interesting to the members of the Architectural Association, but which appears to me not only devoid of all practical utility, but tending to convey erroneous impressions on the subject of cements generally, although Mr. Redgrave glibly discourses about the opinions and doings of chemists who, in a sort of desultory manner, have from time to time experimented on cement. It is as well, for the more useful consideration of this great question, to disentangle it from the conflicting opinions of learned theorists, and reduce it to one of rigid practical utility. Quotations from Batty Langley, and the host of experimentalists prevailing since his time, is only calculated to embarrass the subject, which, in its natural and sensible aspect, is one of extreme simplicity.

Fat limes were undoubtedly the bases of ancient hydraulic mortars, as they are, generally speaking, that of the modern Portland cement. The Romans, however, we find, produced the lime, and in its caustic and hydrate states, imparted to it the required proportions of silica, &c., to render the compound capable of hardening under water, while the cement-maker of to-day blends the chalk and clay before submitting the mixture to calcination. That is, in reality, the difference between the past and present cement-maker; the one only making for his own use, while the other manufactures for the public at large. The operation of blending the trass or puzzolana with the rich or fat lime was accomplished, in a laborious manner, by beating, and Smeaton even resorted to that method in the preparation of the Eddystone mortar. The capacity of increased setting energy followed from this treatment, although the chemical reactions were much less intense than those realised by the somewhat complex chemical conversion of similar natural ingredients into a double silicate of lime and alumina (Portland cement).

Such a result as Portland cement, in its purest forms, is highly advantageous, and its onward course of usefulness might remain unchecked if it had not those friends who are constantly striving to assist it by their mischievous prescriptions and nostrums. Mr. Colson leads the way in helping to prove that loam added to Portland cement mortar realises better results than certain proportions of lime and sand, with the advantage of making the adulterated cement mortar more putty-like and less *short* in texture. A more recent experience of Mr. Bernays at Chatham Dockyard, related by him in his paper recently read before the Institution of Civil Engineers, says: "When the quantity of loam is small, 12 parts of this gravel (Thames ballast) to one part of cement make, not only a good hard, but a very tough, concrete; but an excess of loam is injurious, and as the workmen say, 'kills' the cement. In winter, the slightest excess of loam in the gravel renders the concrete liable to injury from frost for a long time after it is made." The ballast, in this case, was not washed, and therefore a certain proportion of fine silt or mud was unavoidably present in the mixture. Such reliable experience teaches that the less adulterant used in either mortar or concrete the better—a fact frequently lost sight of by the *improvers* of Portland cement and hydraulic limes. The reason is so obvious that I wonder at the enunciation of such doctrines as sulphuring grey lime and selenitising lias lime. I coin words for the several panaceas of modern scientific mortar ingredients, for the several processes ought to be specially distinguished. Even fat limes of the fattest, in the hands of the intelligent Roman builders, produced good work, as their aggregates were carefully blended in the mortar preparation, and its full value derived, because the lime was usually so circumstanced as to permit of its full adhesive property being developed. Modern fat-lime mortar is prepared on quite different lines, and therefore no beneficial results are obtained, because neither the sand used is of the right quality, nor the lime put into a position where its value can be realised. Limes prepared from pure carbonates have little, if any, power of cohesion, and they should therefore be used only in such quantities as will secure a thin coating to the particles of sand or gravel, when their full adhesive value becomes developed. Mr. Redgrave endeavours to show that induration, in the case of mortars made from limes derived from mountain limestone and white chalk, is due to the silicating influence of the quartzose sand particles, which are slowly attacked by the lime. I had thought such a theory as this was long since exploded, more especially since it received its *coup de grace* a dozen years ago from Mr. Spiller. I think Mr. Redgrave would find it difficult, if not impossible, to form "compound silicates" under such circumstances, for their production is only possible at high temperatures.

Concrete ought to be to the artistic architect the ready means of overcoming the dangers attending the indiscriminate use of natural building-stones, and its slow development is due, in a great measure, to the hitherto insurmountable difficulty of securing a pure and reliable binding-agent. Constructors, of all grades and conditions, have for a long and weary time treated this important question as one to the consideration of which they should not be expected to give much heed or attention, and, consequently, until recent years, and I may say until now even, its preparation is conducted on empirical lines. Now, before we have learned to make good and true concrete, a sudden and embarrassing demand arises for *colour*, which Mr. Lascelles has in a fairly satisfactory manner accomplished in the direction of a pleasing, and, for so far, durable red. Pigmental colouring of concrete is not likely to result in general advance on lines so dubious in character, and the fact of a piece of Lascelles' red concrete wearing to the extent of a sixpenny thickness in eight months in Moorgate-street, indicates that such concrete cannot be of the most durable sort.

Mr. Drake, apparently discarding the obtainment of colour from such sources, proposes to get variety of effect from different coloured natural stones, and develop their several peculiar virtues by polishing—a somewhat dangerous and unsatisfactory proposal; for it would not and could not secure what the artistic architect desires, viz., an even and regular shade; but, besides that difficulty, expense would operate against the use of concrete so manipulated.

In any process of concrete manufacture the operator should not lose sight of the importance and absolute necessity of using *pure* Portland cement, and clean aggregates. In the absence of attention to these conditions, a first-rate concrete is impossible. Bad cement has not the required binding-power, and unless the surfaces of the sand or gravel are clean, any cement will fail to adhere with the desired tenacity.

It would be well if these experimenters would consider the manner by which Nature produces her colours in the mineral world, for an inquiry in that direction would show that the granites of Shap and Mull receive their beautiful tints from heat-agency acting on their metallic ingredients. Terra-cottas derive their various shades from the variable quantity and quality of the metallic oxides in the clays from which they are produced.

Papers, such as those prepared by Mr. Redgrave, may be to some extent appreciated by those to whom they were addressed; but, from my point of view, such information as they convey might have been regarded, twenty years ago, as interesting and instructive; but to suppose that architects had not already studied Vicat, Pasley, and other old-fashioned cement authorities, is not at all complimentary to their intelligence. We are told that "a week or two back, while unloading a barge of cement at some works at which the author was engaged in Staffordshire, a sack of Portland cement fell into the water. It could not be fished up for a day or two, but when recovered it had become converted into a stone-like mass, moulded into the exact form of a sack." Such a minutely recorded circumstance proves, indeed, that a sack of cement hardens in the water, but without accurate details of the tensile value of the cement, the depth of the water in the canal at the points where the accident occurred, or the age of the sack, no profitable deductions can be drawn from so remarkable an occurrence; at all events, I cannot see any useful advantage attained by the prominence given to it in the paper. Mr. Redgrave, however, may repeat what he wrote in replying to some remarks I made at the recent discussion on Portland cement and concrete, at the Institution of Civil Engineers, that "he was surprised at the remarks made by Mr. Henry Reid, who seemed, in his observations respecting the inutility of saving labour and fuel, to be scarcely conversant with the present state of manufacture." Under such a "ban," from a *dilettante* South Kensington expert, I should hide my diminished head; but before doing so I hope that your kindness will afford me the opportunity of recording these somewhat cursory remarks on subjects which, in all humility, I pretend to know something about.—I am, &c.,

Henry Reid.

21, Arundel-street, W.C., Dec. 6.

Sir,—As far as I can understand Mr. Charles Drake's letter, he there offers to supply the public with an article I have patented, and which I have been working at for years to bring to perfection. I saw nothing of the samples he speaks of at the recent meeting of the Institute, and if he referred to them in his remarks I did not hear him; in fact, through my partial deafness, I heard very little that was said, but I wish it to be clearly understood that I cannot allow any infringements of my patents by any one.—I am, &c.,

W. H. Lascelles.

121, Bunhill-row, London, E.C., Dec. 8.

RAILWAY BRIDGES AND IRON STRUCTURES.

Sir,—It would appear almost unnecessary for me to answer your correspondent, Mr. Webster's, letter, but for his information (he evidently does not belong to the engineering profession). Perhaps you will allow me a little space in your paper to inform him upon the few simple matters which appear to puzzle him.

In doing so I will follow the points of his letter.

Under bridges, as used in my letter, does not necessarily imply that all exposed parts are *underneath the bridge.*

The locomotives named in my letter are in use on the Midland and other railways.

The admiration of your correspondent as to the odd quarter, and $4\frac{1}{4}$ times the greatest load, is only in keeping with the other parts of his letter, which shows a great want of engineering and mathematical knowledge. This calculation is the nearest approximation to the requirements of the Board of Trade.

I must refer him to Fairbairn on tubular bridges, Matheson on iron structures, and Shields on strains on structures of ironwork, for information. As to elongation of fibre and detachment of the grains of iron, it would take up too much of your valuable space for me to go fully into these matters in a letter.

It will, I think, be hardly necessary for me to give your correspondent another "little proportion sum," as I have no doubt any small schoolboy in Hull would be able to work him out the sum and show him that an increase in the rolling load of 100 per cent. is equal to a decrease of the strength of the bridge 50 per cent.

Engineers will, I'm sure, be aware of the difficulty of getting iron (without extra cost) for bridge work to stand 20 tons per inch. I have had several tests recently made in iron from makers of repute, some of which were as low as 17·90, although stipulated for 21 tons.

I think my statement of the $\frac{3}{4}$ of a cwt. per square of oxide of iron scraped from the warehouse floor admits of only one interpretation, and I need hardly further explain it.

I may say that I have had several letters lately upon this subject from engineers, some of whom say that these matters must sooner or later be brought prominently before railway directors, with a view to some steps being taken to secure the public using the lines of railway where such changes and attention to these bridges are necessary.—I am &c.,

W. Graham Lees, C.E.

180, Radford-road, New Basford,
Nottingham, Dec. 8.

ST. ALBAN'S ABBEY.

Sir,—In your issues for the last two weeks, you have given to the public drawings of the projected new front of St. Alban's Abbey, by Mr. J. O. Scott and Sir E. Beckett respectively.

I will not presume to offer an opinion on the merits of the two designs; but would it be too much to request, considering that such a work as this in one of our most venerable national buildings is of national importance, that some one or more architects of established reputation should offer (in your pages, if you will so allow) their comments on the two plans, and on the fitness of either the one or the other for such a building? It would be a great benefit if the subject were thought worthy of notice at the Institute of British Architects. To judge from what one hears and reads (so late as even in today's *Times*), a pretty concordant condemnation of at least the new window in Sir E. Beckett's plan seems to exist. Is this condemnation just? and is the rest of the plan satisfactory? It appears, from the statement accompanying this design, that the cathedral is, architecturally, wholly in Sir E. B.'s hands, so that there is no appeal but to the public.—I am, &c.,

Dec. 7th. Amateur.

LIVERPOOL SCHOOL OF ART COMPETITION.

Sir,—I fear the exertions of the investigation committee of the R.I.B.A. on Competitions will be of little avail in mitigating the competition evil. It is a well known fact here that many of the competitors in the above competition, the conditions for which were opposed in every way to the Institute suggestions, signed the petition issued by Mr. Cole A. Adams some time back, and several are Fellows of the Institute. There is another competition advertised in this neighbourhood, viz., the West Derby Cemetery Competition, the conditions for which are even more unfair to the profession than were those for the School of Art; the three premiated designs are to be monopolised by the committee; there is no professional referee, and no guarantee that either of the designs submitted will be carried out; yet there will doubtless be as unseemly a scramble for this "plum" as there has been for the other. If architects so far forget their dignity as to compete under these circumstances, there is little use endeavouring to improve matters. I may remark, in passing, that I hear on good authority, the selection of the best design for the School of Art is left in the hands of a committee of six, not one of whom is in the least degree conversant with the merits of either plans or elevations, so that there is the cheering prospect of a general scramble, with the probable result that the most proficient "tout" among the 75 competitors will secure the prize.—I am, &c., Surprised.

Liverpool, Dec. 1.

SELBY WESLEYAN SCHOOL AND CHAPEL COMPETITION.

Sir,—An advertisement inviting architects to send in designs for new Wesleyan Schools and alterations and additions to the present chapel, appeared in your issue of November 19 last. I wrote for and received instructions, which were evidently got out by an architect, including the plan of site, which is very pretty, and indeed merits a frame.

In the particulars enumerating the drawings required, it says: "Longitudinal and transverse required for both chapel and schools; the levels of floors of new building to match those of present one; rights of light all round to be shown." Then it goes on to say: "Sections required for pulpit and platform, showing altered positions, also sections of pews below and in gallery." In fact, according to the particulars, a complete and concise set of plans are required, with "separate estimates for schools, repewing bottom of chapel, alteration to gallery, extension of organ-gallery and entrance," and the total expenditure is not to exceed £4,000; and what is still more outrageous and insulting to the profession is, the authors of the plans, &c., who receive the £15 and £10, are to forego the pleasure of ever seeing their drawings, &c., back.

All this, with a great deal more, means, at a half-glance, that whoever in London is bold enough to venture upon such a lucrative campaign, must send at least two assistants to take plans, elevations, and sections of the existing buildings, and the necessary levels omitted from the instructions, which means a clean out of pocket expenditure of say £10, supposing they were away but three days from London.

Now, Sir, is this doing justice to the profession? I think we ought to rise as one man to support Mr. Thomas Porter, who is so nobly trying to regain for the profession its time-honoured reputation.

It would have been much better had the Wesleyans of Selby invited a few local architects (there surely must be some in the town) to compete, and not to have made themselves the laughing-stock of all sensible people.—I am, &c.,

London, S.W., Dec. 6. J. T. S.

GLASGOW MUNICIPAL BUILDINGS' COMPETITION.

Sir,—Your correspondent, "A Competitor," in your last week's issue, suggests that Mr. Barry should be urged to make his award in the above competition "on the question of merit only, irrespective of cost."

This, I am confident, would be a very unsatisfactory conclusion to the affair. I, for one, could have prepared a design much superior to the one I submitted, had I chosen to disregard the cost. The instructions were clear upon the point, and it was therefore the duty of each competitor to do his best under the circumstances. I was so fearful lest my drawings might be disqualified, that, although in visiting the site, a tower or dome at once suggested itself as an almost necessary feature, I reluctantly abandoned the idea of either, as I knew that I could not do it for the money provided, in addition to materially altering Mr. Carrick's plan.

As regards frames and borders being disallowed, I did not even put border lines in my drawings. I also worked strictly to Mr Carrick's plan, not presuming to alter more than the instructions gave license for, and that only the position of doors and windows.

I endeavoured to keep the question of cost constantly before me, and am firmly of opinion, as stated in the report accompanying my design, that a building erected from my plans could be finished for £150,000. There are others, no doubt, who have felt similarly tied down while endeavouring to comply with the committee's requirements, as furnished to each competitor; and it would be most unjust if a flashily got-up design, which in work might cost nearly double the amount specified, were chosen in the face of honest, though necessarily less elaborate, work. My idea is that *all* who have chosen to disregard the instructions supplied for their guidance, should suffer by being disqualified, and the most meritorious designs, worked according to the instructions, chosen for the premiums. Or, if the magistrates and council find that they have committed themselves, and are *compelled* to pay the premiums to the three architects already named by Mr. Barry; then the most satisfactory way would be to give an honorarium to, say, the first twelve; and invite them in limited competition for a building of larger dimensions, which will undoubtedly be required.—I am, &c.,

Old T-Square.

Sir,—My careful examination of the designs for the above led me to a conclusion just the opposite to that of "Competitor" in last week's issue, viz., that the award should be revised with a view to maintain the conditions of the contest, and not to ignore the chief one.

I own the difficulty of cost to the designers, but a few of them, less than seven I judge, fulfilled the instructions, even if "dignity" was won partly by plainness.

Out of these, three should be chosen to receive the premiums, before anything further is undertaken.—I am, &c.,

Dec. 7. Another Competitor.

PONTEFRACT TOWN-HALL COMPETITION.

Sir,—I beg to thank you for the very complimentary critique on my designs for the Pontefract

Town-hall; allow me to say, however, that my plan is not "very similar in all respects to the first-named." I do not arrange "recess for fire-engine room, or council-chamber," neither of these being required; nor do I place the cells in the basement, with the inconvenience of a staircase. My arrangement of corridors is altogether different, and I submit much superior for light and convenience. My entrance and staircase has a very superior arrangement, and is thoroughly well-lighted, the staircase being in front of the person coming in, and not in a side, badly-lighted recess. I beg to inclose description and rough sketch of plans, which will clearly explain my arrangement, which is implicitly in harmony with the instructions.—I am, &c.,

Leeds. Queen Anne.

THE LAW AS AFFECTING QUANTITY SURVEYORS.

Sir,—The profession generally are much indebted to Mr. Francis Turner for the very able paper on the "Law as Affecting Quantity Surveyors," recently read at the Institute of Surveyors, and published in your columns.

It is not often that barristers so thoroughly master the subject of quantity-surveyor law as Mr. Turner has done, still less do they give the public the benefit of their experience in so clear and concise a manner.

In his paper, Mr. Turner refers to a case in which a surveyor sued a building owner for his charges, but he (rather unfortunately, I think) omitted to state that it was taken to the Court of Appeal, and that the judges there ratified the decision in the Court of Queen's Bench.

As plaintiff in that case, which was, I venture to think, one of some importance as regards the principle involved, I send you the shorthand transcript of the judgment, which, with a few prefatory remarks on my part as to the facts, may, I hope, help to place in a clear light the law on the subject, as definitely laid down in the Court of Appeal.

The following facts were proved at the trial:—The defendant employed an architect who, with his knowledge, instructed plaintiff to take out quantities for a house; plaintiff took out the quantities, tenders came in, plaintiff's charges were included in the summary; a tender was accepted (the defendant being shown the summary before the contract was signed, and being informed of the amount included for plaintiff). The work went on, defendant requested his architect not to include plaintiff's charges in any of the earlier certificates, with the intention of keeping such certificates at as moderate an amount as possible. Work to the value of £1,400 was executed, and certificates granted for £1,100. The builder failed; defendant took the work out of builder's hands and employed another builder to complete. Previous to this plaintiff had applied to builder for his charges (and on being told they had not been included in any certificate), sued the defendant on the ground that he (the defendant) had by design prevented the plaintiff from obtaining the charges in the usual way.

The case was tried before Mr. Justice Field, in the Court of Queen's Bench, on December 3 and 4, 1879, Mr. McIntyre, Q.C., and Mr. Francis Turner being counsel for plaintiff; Mr. Waddy, Q.C., for defendant.

Mr. Justice Field nonsuited plaintiff with costs, and on appeal before Lords Justices Bramwell, Baggallay, and Brett, at Westminster, on May 27 last, after hearing counsel for plaintiff, and without calling on counsel for defendant, the appeal was dismissed with costs.

I think it may be summed up shortly that the law on the question is this:

First. An architect may employ a quantity surveyor to take out quantities, and if by default of the building owner no contract is entered into, then the building owner is liable to the surveyor for the charges (Moon v. Guardians of Witney Union; Gwyther v. Gaze.)

Second. If, however, a contract is entered into by the building owner with a builder, the contract to pay the surveyor's charges by the building owner at once shifts to the builder, who only is then liable to the surveyor (Young v. Smith).—I am, &c.,

Sidney Young.

5, Henrietta-street, Covent-Garden, W.C.
December 6.

Court of Queen's Bench.—Young v. Smith.—4th December, 1879.—Judgment.—Mr. Justice Field: I am very clearly of opinion that this case fails; I thought so yesterday, and I think so still more to-day. This is an action to recover the sum of £86, which, the plaintiff alleges, is the fair value of his work and services as a quantity surveyor, and he brings the action not against the builder, but against Dr. Smith (whom I will call shortly) the employer. In order to prove that contract he must prove, in the ordinary way, that he was employed by Dr. Smith, either personally, or by means of some authorised agent, to do the work in question upon the terms that Dr. Smith would pay him the fair value of his work. He has got to make out that contract, otherwise he fails. Now, what does he prove? He proves that Dr. Smith was about to build a house, and that he had adopted a course very common in those cases. The learned judge then recited the facts as given in evidence, and proceeded: Quantity surveyors are very able gentlemen, and they do a very large business, and I hope make very large profits when they are successful; but sometimes, like every other profession I suppose, they have losses. What is the contract made with the quantity surveyor? I take it to be very clear that the contract is this: "I am going to build a house," says Dr. Smith, "and I am going to put it up for tender, that is, I am going to let the trade tender, or certain named people," because, generally speaking, the tenders are invited from certain builders selected by the architect. He says, "I am going to ask if they will tender upon your quantities, and what sum they will ask to have this work done for." If it is put up for tender, and if there is a successful competitor who enters into a contract, what happens? "It is not intended that I shall pay, but that the successful person shall pay you" (the builder I will call him). That is the contract made with the employer. I am putting it as the employer now, irrespective of the case that was cited in the course of the argument—the contract is not a contract for payment, it is a contract that "I will go on regularly in course to obtain a contractor who, by his contract, shall not only contract that he will build the house, but shall also enter into an implied contract with you (the quantity surveyor) that if I will add to the sum mentioned in the contract the sum due to him, he (the builder) will pay you." That is the conditional contract; therefore, if things take their ordinary course, that contract becomes completed by the course of conduct. What was the course here? Mr. Young did his work, and I have no doubt that he did it very well, and it went to tender. A contract is entered into by which, with the knowledge of Mr. Young, and upon the custom or usage of the case, the employer, instead of paying Mr. Young or making any engagement with Mr. Young to pay him for his service, engages and contracts with the builder that he will pay the builder for these services. Thereupon, according to the usage as proved to-day, there is a new contract made—an A B C contract—which entirely gets rid of and destroys the old contract. No doubt that is what happened in this case. Mr. Cook did make that contract, and the sum was added to the tender, and added to the contract price, and there was a contract to pay by instalments. In this case everything went on in the ordinary way. The contract was made. The architect certified up to a certain sum; but in the month of May or earlier—at all events, April or May—the builder became embarrassed—sometimes builders do get embarrassed. Therefore, in the months of May and June the state of things was that there was a considerable sum certified for, £1,100, and there was also work still left undone. On the 18th of June Dr. Smith had not, as Mr. Turner says, determined or rescinded the contract, but under the powers and provisions of the contract, he took the work out of the hands of Cook and completed the work himself. The evidence shows, I think, that up to this time Mr. Young had never made any application whatever to the defendant Smith, but had applied to the builder for payment, and the builder had said, "I can not pay you because Mr. Alexander has not included any sum for quantities in my certificate." Thereupon Mr. Young waited, perhaps in accordance with the usage—I do not know. He thought he could not sue the builder perhaps. The question to-day is whether he has any right of action against Dr. Smith. I say that there has been no contract here by Dr. Smith to pay. I do not adopt the language we heard of yesterday about shifting liability. There was never any contract here which Dr. Smith has broken. This contract was, "I will go on and will employ a contractor to build this house at such sum as I think reasonable." He did employ a contractor for the sum which he thought reasonable, and the contractor went on and ultimately made default. Then Mr. Turner grounds himself upon the authority, or the supposed authority, of the case of Moon v. The Guardians of the Witney Union; but that case does not carry him any distance at all. In that case the employer had failed in his conditional contract; he had not got a builder at all; he had got no one. Therefore, the true view, I think, of Moon v. The Guardians of the Witney Union, so far as it does not depend upon the particular facts of the case, so far as it is a principle at all, is in accordance with the conclusion at which I have arrived in regard to this case. Mr. Turner says that the question arises upon the defaults of Dr. Smith. I know of no default of Dr. Smith at present—none whatever. He gave him a builder, and, as far as I know, he has performed his engagement with the builder. There is no evidence that he has not; there is not the smallest evidence that he has done other than perform his contract with the builder. He has not paid the builder, and for aught I know the builder does not deserve to be paid. I do not want to make any reflection upon Mr. Cook, but he seems to have gone into liquidation very soon afterwards, and, for aught I know, Dr. Smith has paid all that he has to pay. The misfortune of Mr. Young, no doubt, is that the architect did not think it right to include in the certificate anything for quantities. That is not the affair of Dr. Smith. According to Mr. Young's very fair and good evidence, the architect exercised his discretion according to his best judgment, and Dr. Smith is not liable for that in any shape or way. The architect is not the agent of Dr Smith; he is the judge between the three parties, and I hope and believe that all good and honest men know that duty, and thoroughly exercise it as between man and man. There is no liability whatever on Dr. Smith for any act of that kind, nor is it any default whatever of Dr. Smith. I have, therefore, not the slightest hesitation in saying (although I regret it for Mr. Young's sake, because he cannot make Dr. Smith liable) that I nonsuit him.

Intercommunication.

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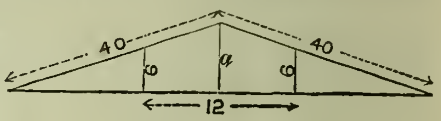
QUESTIONS.

[6323.]—**Stone Mantelpiece.**—I wish to decorate an ordinary white stone mantelpiece. Should oil or water-colours be used, and what preparation is needed for the stone, and how are the colours prepared?—G. A. H.

[6324.]—**Norman Woodwork.**—I happened to be in the north transept at Winchester, yesterday, in company with Mr. John Colson, the Cathedral architect, when my eye was arrested by an old oaken bench of rude, but immensely strong, construction. This bench had standards at either end, having poppy head-like terminations, very crude in character and design. In answer to my query, Mr. Colson suggested the possibility of the seats being Norman, although, of course, no absolute proof existed of its belonging to that or any other period. Personally, never having seen any Norman woodwork in my life, I was powerless to combat the idea without feeling that I could altogether accept it. Can any one tell me where Norman woodwork still exists? Parker's "Glossary" is quiet on the matter, and Mr. Collings, whilst giving many illustrations in his "Gothic Ornaments" of Norman stonework, fights shy of the woodwork of that period. The earliest and most perfect woodwork I know (of course, I except the beautiful examples of Roman and Greek carved woodwork our British and the National Museums of other countries possess — referring now to our own British handicraftmanship) are the 50 miserere seats in the choir of Exeter Cathedral, some few others, and some stalls at Salisbury, and one miserere in Henry VIIth's chapel, Westminster Abbey. All these date from the early part of the 13th century. What oak have we of a prior date?—Harry Hems, Exeter, Dec. 4.

[6325.]—**Colouring Portland Cement.**—Can any of your readers suggest an inexpensive means of permanently colouring Portland cement without impairing its durability?—J. H. B.

[6326.]—**Kingpost.**—Would you, or any of your mathematical readers, be kind enough to solve the following question:—Let the back of a principal equal 40ft. the length of queenpost equal 6ft., the distance of queenpost 12ft. Required the length of kingpost *a*.—William Hetherington.



[6327.]—**Colouring Portland Cement.**—Will some reader enlighten me as to the mode of colouring external Portland cement, rendering a red colour similar to good facing bricks? Would brick-dust mixed with the cement in lieu of sand do? Where can I procure specifications or any information with regard to this sort of coloured work?—Fresco.

[6328.]—**Oak Shingles.**—I wish to cover an octagonal bell turret with oak shingles, but never having used them previously, shall be much obliged if any fellow-reader will give me information as to the best method of laying them, &c., more especially with regard to the hips, as I do not want to have rolls or lead on these if I can possibly avoid them.—North Country.

[6329.]—**Tile Roofs.**—Is there any practical objection to putting a little hair-mortar or cement under the centre of each nib-tile in laying them, so as to render them more secure against being ripped by the wind, and also preventing so much draught passing between them? If any of your readers would kindly give me the benefit of their experience, they would greatly oblige a—Young Architect.

REPLIES.

[6305.]—**Dip-Traps.**—In the reply on p. 662, by Mr. Brady, I consider the statement that "the seal should dip at least 6in. into water," to be a mistake. Dr. J. A. Russell, of Edinburgh, thinks 1in of dip enough, while both Dr. Fergus and myself consider 1½in. amply sufficient for all practical purposes, and much more sensible than 6in. With 6in. of seal an unnecessarily difficult barrier is put into the ready passing away of the fæces, &c., and such a great depth of seal also implies an unnecessarily large body of water lying in the trap. The talk about heavy pressure in the drains beyond the trap after heavy rains is purely imaginary, and generally exists only in the brains of those writers who don't know much about the subject. Even supposing a temporary reflux of sewer air did take place at the trap or main drain, the other traps would prevent it getting into our houses.—W. P. Buchan.

[6311.]—**Plaster Coves to Eaves.**—Render in Portland cement and finish with coat of 1, lime-putty, 2, clean silver sand, and a little chopped white hair. I find this does not crack, and remains pure white, though I would advise "Young Student" to take off the rawness with a little yellow or red.—M. E. L.

[6315.]—**Sections.**—In measuring drains, or anything else, when drawn to a greater vertical than horizontal scale, I have usually measured the height of one end above the other on the vertical scale, and then marked the height with a pencil point, to the same scale as the horizontal. Connect the two ends with a faint line, and measure along that. Graphic methods, I find, are always less labour than calculations, which are usually a complication of figures, in which an error might easily be made, but not so easily discovered.—A. H. B.

[6319.]—**Party-Wall.**—Figure 2 is the usual way, but let ends of joists enter wall 2¼in. If the wall is not too lofty the break of bond won't matter, and the building will be better tied. The irons or plate corbels are generally purpose made by any smith, about 3in. × ¼in. The lower edge of joist should be level with the underside of plate corbel, so that plastering may travel through. Figure 1 is, of course, better construction.—Q. S.

[6319.]—**Party-Wall.**—Would not Beckett's (Hartford, Cheshire), patent wallboxes for joist meet the case of "Party Wall" in last week's Building News. They only require 4½in. hold.—X.

[6321.]—**Sewage Systems.**—I believe that Captain Liernur's system has not been applied in England up to the present, but is successful in those towns on the Continent where in use. Details of this system, as well as of that at Rochdale, will be found in "Bailey Denton's Sanitary Engineering," and I shall be glad to supply "Coventry" with a copy from mine *re* these systems, should he be unable to obtain loan of same, and likes to advertise his address.—A. E. W.

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STAINED GLASS.

Mowbray Church, Cape Town. — Another stained-glass lancet window has been added to this church, containing the subject of "The Holy Women going to the Tomb after the Resurrection," arranged in a large medallion with emblematical foliage for groundwork, and has been executed by Mr. Frank Holt, Stained-glass Works, Warwick.

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WATER SUPPLY AND SANITARY MATTERS.

Pollution of a Sussex River.—An injunction has just been granted, under the provisions of the Rivers Pollution Act of 1878, against the authori- of Lancing College, Sussex, allowing the sewage to enter the river Adur by means of what is locally known as the Clayton stream, near Hurstpierpoint. It was shown that the sewage from the college named flowed into and polluted the river in question. A local sanitary inspector testified to the contamination of the water through an unprevented flow of sewage from the college, which had as many as 250 students. Mr. Bailey-Denton, consulting engineer, of London, detailed his professional visit to the source and scene of the pollution, and said that he had examined the place in 1879, and suggested that the local soil should be rendered suitable for irrigation, as this was possible and would not be too expensive as an experiment. The engineer further said that Mr. J. G. Dodson, M.P., was owner of the land, and as that gentleman was President of the Local Government Board, he would, perhaps, give facilities for acquiring the needed irrigation land by purchase. Analytical and other evidence followed as to the river and stream pollution by the sewage from the college. The authorities of the latter, in defence, contended that due efforts had been made to deal with the sewage; but an injunction was eventually granted as asked for by the Cuckfield rural sanitary authority.

Wimslow Sewerage.—The Wimslow Local Board of Health having a district of an area of 6,907 acres, and a population of 7,000, offered, 16 months since, premiums of £100, £50, and £25 for the best schemes for sewering and disposing of the sewage of the district. Mr. J. G. Lynde, C.E., formerly city surveyor, of Manchester, was appointed referee, and the first premium has been awarded to Messrs. E. Corbitt and Sons, of Manchester; the second to Messrs. Brierley and Holt, of Blackburn; and the third to Mr. Vawser, of Manchester. Messrs. E. Corbitt and Sons' scheme is on the "separate system" for collecting only sewage in the new sewers, leaving the rainfall to be conveyed by existing drains, streams, &c. It provides for a northern and a southern outfall of 15in. glazed earthenware pipes, jointed watertight in cement, with branch sewers of 12in. and 9in. pipes. A sewage farm of about 57 acres is proposed on or near Lindow Common. The sewage is to be raised, from the two outfalls, a height of about 45ft. to the farm, by means of "Shone's patent sewage ejectors," worked by compressed air from a 6 h.p. engine at the farm. Duplicate engines and boilers will be provided. Sturgeon's patent trunk air compressors are recommended. These would supply compressed air at about 30lb. per square inch to the two ejector stations, where the sewage would be discharged along 6in. pipes up to the farm. An air accumulator would be provided at the farm, of 2,000 cubic feet capacity, like a boiler shell. The estimated cost of the whole scheme is £15,550.

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LEGAL INTELLIGENCE.

The Widening of Ludgate-hill.—Last week the case of "Smith v. the Corporation of the City of London" was tried in the City Court of Sessions, before the Recorder (Sir Thomas Chambers), Q.C., and a special jury. The plaintiff was the owner of 33 and 35, Ludgate-hill, and in March last, having made preparations for the pulling down the old premises and erecting more commodious ones, he was served with an order by the Commissioners of City Sewers to put them back a considerable distance under the powers of the Act of Parliament for the widening and improvement of the hill. The claim, which was for £16,007, was made up of various charges for loss of extent of premises, and the decreased rental consequent upon it. There were other claims for loss of profit on stock purchased in anticipation of the proposed enlarged premises, and for extra expense in building, the present smaller premises requiring a stronger wall to carry the weight of the rooms over them. Mr. Grantham, Q.C., with Mr. Bray, were counsel for the plaintiff; Mr. E. Clarke, Q.C., and Mr. Brookes for the defendants. On the part of the Corporation it was contended that the claim was an excessive one, and should have been nearer £4,400 than £16,007. The jury found for the claimant—damages £9,691. In the case of "Glover v. the Corporation of the City of London," which was also heard in the same court, the plaintiff was the lessee of 15 and 17, Ludgate-hill, where he carried on the business of a ladies' and juvenile warehouse. He claimed £11,500 in respect of having received similar notice to put back his premises, by reason of which he lost space and the value of his leases was reduced. The jury found for the claimant—damages £6,340.

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CHIPS.

A coffee-tavern, Elizabethan in style, is about to be built in St. Mary-street, Cardiff, from the designs of Mr. Peter Price, of that town.

A stained-glass window has just been placed in St. Neot's Church, Hunts, in memory of the late Mr. G. Dawson Rowley. The subject is "The Garden of Gethsemane, and the cost was 500 guineas. Messrs. Hardman and Co., of Birmingham, executed the work.

A new steam-mill has just been erected at Reedham for the purpose of draining the marshes on the borders of the river Yare. Mr. Barnes, of the Southtown Iron Works, Yarmouth, constructed the building, and provided the powerful pumping machinery.

A new Presbyterian church was opened at West Hartlepool on Wednesday week. It is Gothic in style, and has a spire 126ft. high. The internal dimensions are 76ft. long, by 42ft. broad. Mr. Garvy is the architect, and the cost has been £4,500.

The town council at Bristol, at a meeting held on Friday, empowered a committee to frame terms for arbitration, in order to obtain the transfer to the corporation, by purchase, of the Portishead and Channel Docks, at the mouth of the river Avon.

It is stated in *Truth* that Mr. Redgrave, R.A., has resigned the office of surveyor to her Majesty's pictures, which he has held for many years, together with the appointment of Inspector-General for Art—offices worth £1,000 per annum; and that he will enjoy a retiring pension of £750 a year. It adds that the office will probably be bestowed on a relative of Mr. Redgrave.

The first section of the Southwark and Deptford Tramways was opened last week. It extends from the Spa-road, Bermondsey, into the Lower-road, Deptford, where it is at present stopped until the Metropolitan Board of Works have rebuilt the Creek-bridge and carried out the street improvements at this end and also at the Bermondsey extremity. On account of the heavy traffic of the district, the lines have been laid with unusual solidity; the foundation is of a solid bed of concrete of a minimum thickness of 6in., and the rails are of steel with 7in. wrought-iron continuous bearings, and weighing 112lb. to the yard. The works have been carried out under the superintendence of Mr. W. Shelford, M.I.C.E., by Mr. John Dixon.

The Woburn district highway board proceeded on the 2nd inst. to appoint a surveyor in the place of Mr. Atkins, who had resigned after 17 years' service. From 52 candidates, five had been selected, including Mr. Atkins, who had reconsidered the matter. Mr. Platt, of Wellingborough, was elected by 17 votes against 10 for the ex-surveyor.

A new Board-school was opened in Park-walk, King's-road, Chelsea, on Tuesday. It accommodates 864 children, and has cost for erection £8 13s. 8d. per head.

The principal stone of the invert sill of the large graving docks at Milford, Pembrokeshire, was laid by Sir E. J. Reed on Saturday. The dock will be 700ft. long, 90ft. broad, and 26ft. deep, and has already, in its unfinished state, accommodated the *Great Eastern* steamship. The stone of the sill was laid at a great depth below the sea-level, in the largest submarine excavation ever made by tide work. The system of laying foundations adopted is that of hollow monoliths of concrete. Messrs. S. Lake and Co. are the contractors.

The local boards of Pontyridd and Ystradyfodwg, at a special joint-meeting held last week, approved and adopted the scheme prepared by Mr. Lomax, C.E., for the sewering of the combined arbour sanitary districts. The estimated expense is £10,000.

Our Office Table.

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At a meeting of the Balloon Society last Friday, Captain Douglas Galton read a paper on "Fog Generally, London Fog in Particular, and what might be Done to Improve the Salubrity of the Atmosphere of the Metropolis." While pointing out that much of the London fog was due to natural causes, which could not be modified—such, for instance, as the geological character of the subsoil, the position of the metropolis in the valley of a considerable river, and, above all, the insular character of the kingdom, which gave ready access to masses of watery vapour from the surrounding ocean—it would still be possible to diminish local fog by underdraining all open spaces, such as parks, squares and gardens. The evils of fog, however, would be comparatively trifling but for its intercepting and retaining the products of the imperfect combustion of our bituminous coal fuel, which caused almost incalculable evils in the shape of impurities highly injurious to health, both directly by entering the lungs, and indirectly by intercepting sunlight. Dr. Frankland had shown that these carbon particles attached themselves to and enveloped the watery vesicles of the fog cloud, giving it its special colour, its irritating character to the respiratory organs, and making it more persistent than it would otherwise be. This might be remedied by perfect combustion, made compulsory in private houses through the medium of legislation, the means being the use of anthracite, or coke and gas, on the plan suggested by Dr. Siemens, or by improved stoves, capable of consuming the ordinary bituminous coal with which London is at present almost exclusively supplied.

The Lord Mayor attended at the Institute, Drummond-street, Hampstead-road, on Saturday last, to distribute the prizes to the successful competitors in the Industrial Exhibition held in connection with the Tolmer-square Institute, which was opened on the 16th October last, and which closed on the 30th of the same month. The prizes consisted of one gold, 15 silver, and 43 bronze medals, 63 certificates, and eleven presentations from gentlemen interested in the Exhibition. Mr. Meech, the secretary, made a statement as to the result of the exhibition, according to which it appeared that during the fortnight it was open it had been visited by about 10,000 persons. The receipts amounted to about £150, and the expenses to £123. So satisfactory had been the venture that the Committee had determined to hold a similar exhibition next year.—The successful candidates, as they presented themselves, were loudly applauded. The gold medal was taken by Mr. O. R. Plummer for a carved oak chest of drawers, whilst the silver medals were awarded, amongst other things, for the model of a yacht in silver, embossing on copper, wood-carving and turning, models, inlaid work, painting in oils, water-colours, pencil, and on terra-cotta, and amongst the prize-takers were not a few ladies.

A deputation consisting of Mr. Ernest Hart, Professor Chandler Roberts, F.R.S., Colonel Festing, the Rev. H. V. Le Bas, the Rev. S. A. Barnett, Mr. S. Hadley, Mr. W. R. E. Coles, and others had an interview on Monday with the Lord Mayor at the Mansion House, to interest him in the efforts now being made by the joint committees of the National Health and Kyrle Societies, to reduce the mischief arising from the present excessive production of smoke in the metropolis. Mr. Ernest Hart said the societies thought that a very great deal might be practically done to make the atmosphere in London as pure as that in Paris. It was proposed to conduct trials of the various kinds of fuel, and to promote competitive testing of the appliances available at present, or which might become available, for the purpose of lessening the production of smoke. The smoke proceeding from the fires of private houses might be materially lessened by the use of improved apparatus, and that from factories might be abated, with little interference with the manufacturing interests, if the employers would only co-operate with the societies towards that end. There was about to be an exhibition at South Kensington of the different kinds of apparatus and fuel, which would be practically tested. They now asked the Lord Mayor to let them bring the matter before the notice and attention of the citizens by means of a meeting at the Mansion

House on the subject. The Lord Mayor public attention, and promised to allow a thought it a matter well deserving of the conference in the Long Parlour of the Mansion House on Friday, Jan 7.

The third of the Cautor lectures on "Some Points of Contact between the Scientific and Artistic Aspects of Pottery and Porcelain," was delivered on Monday, by Professor Church, who introduced his subject by referring to the stonewares glazed with salt which had been made in Germany, Staffordshire, and at the works of Messrs. Doulton in Lambeth, noticing their progression from stoneware, jasper-ware, and porcelain. The substance invented by Wedgwood was a clay rendered less greasy by the addition of silica in the form of fine sand. After enumerating the proportions of various substances in different clays, the lecturer proceeded to consider the physical properties of the clays. They contracted very differently, as was shown by the beautiful series in the Jermyn-street collection. Stourbridge clay contracted only 2 per cent.; others one-fifth of their whole bulk. The Staffordshire potters of latter times used the grey clay from the coal measures, and later still a pint of red lead to a bushel of salt thrown into the furnace with the clay. The third improvement, about 1720, was by the introduction of flint to the extent of 20 or 25 per cent. The superiority of Wedgwood's earlier work consisted chiefly in his fine and careful grinding of the materials used. On the site of Dwight's factory at Fulham remains had been found which indicated that his manufacture had attained a high pitch of excellency, particularly in Bellarmines. There were in the British and South Kensington Museums figures made at this factory and glazed with salt. The Staffordshire potteries no longer produced salt-glazed ware. Tradition said that some Dutch potters who came to London in 1688 invented the glazing of white ware with salt, which was improved upon by other makers. This ware could be divided into four periods—prior to 1720, 1720 to 1740, 1740 to 1760, and 1760 to 1780, when the wares were decorated and perforated. The two last periods were distinguished for their ornamentation. The lecturer then enumerated the characteristics of these various periods, illustrating his points by specimens, some of them of great beauty and excellence; concluding by exbibiting works of Messrs. Doulton, James Stiff and Son, and others in illustration of modern pottery.

Cases have occurred in connection with railways in which the landed proprietors through whose estates the land runs have given the land free, and themselves got or subscribed the capital for making it. It is by no means impossible, therefore, that the idea to which attention was called in the *Daily News*, on Friday last, will be taken up—namely, that landlords should subscribe together to help to maintain a line. The railway is that from Shrewsbury to Llanymynech. It is closed at present because it did not pay. Its closing has depreciated the value of the property through which it passed. The landowners are accordingly politely requested to rate their estates at 1s. per acre per annum. A shilling per acre on each side of the railway over a tract of country a mile wide will produce just enough to run a daily train. It is computed by the Institute of Surveyors that a railway increases the value of estates by 3½ years' purchase, though the owners have hitherto been paid for allowing the benefit to be done to them. If they now pay a little to get back five times as much, they will not be driving a bad bargain.

The Executive Committee of the Parkes' Museum of Hygiene have, in response to a suggestion made by the Nineteenth Century Building Society, arranged for a course of lectures in the Museum to the members of building societies. The subject of the lectures is to be "Dwelling Houses," and the first lecture of the course will be given next Saturday by Mr. Edward C. Robins, F.S.A., on "Situation and Construction." Free tickets for the lectures are being distributed by the several Metropolitan building societies. Captain Douglas Galton, C.B., F.R.S.; Mr. Robert Rawlinson, C.B., of the Local Government Board; and Mr. E. C. Robins, F.S.A., have just been elected members of the museum committee.

A paragraph has appeared in some of the newspapers on the recent discovery of a charnel-house in the churchyard of the Church of the Holy Trinity, Stratford-upon-Avon, the resting-place of the remains of Shakespeare. As the writer has rather misrepresented the facts, and made it appear that the remains of the great poet are in danger of being disturbed, we may briefly state what has happened. Mr. Butterfield, the well-known architect, on his first visit of inspection, had certain excavations made for the purpose of finding out the size of the old vestry building, which was taken down in 1800. In making them the walls of a charnel-house were discovered which had formed the lower chamber or crypt of the old vestry. In this was a large collection of bones, no doubt gathered into it from time to time by the sexton and stored there. There was nothing, of course, remarkable in this discovery, as chambers for a similar purpose were often built, in which the bones of those interred in the graveyard and which had been thrown up by the gravedigger were deposited. There is no doubt that this old charnel-house had been in use for centuries. Nothing more has been moved than would just expose the outline of its walls. Far less respect must have been shown it when, in 1800, the vestry and itself were destroyed. Nor is there the slightest foundation for the extraordinary inference that Shakespeare's remains, which are deposited within the chancel, will be in any danger of being disturbed. The chuch is cruciform, consisting of a nave and side-aisles, transept and chancel; the latter was built originally by Dr. Thomas Balsal, Dean of Stratford, during the latter part of the 15th century. There is a tower and spire over the crossing. We hope shortly to be enabled to give our readers some idea of the plan proposed by Mr. Butterfield.

The programme of lectures arranged to be given at the theatre of the Royal Institution, in Albemarle-street, W., during the coming session, includes two by the Rev. William Houghton, M.A., F.L.S., on "The Picture Origin of the Cuneiform Characters," fixed for March 3, and 10; a course of four by Mr. H. H. Statham on "Ornament, Historically and Critically Considered," on March 17, 24, 31, and April 7; one by Mr. Alexander Buchan, M.A., F.R.S.E., secretary of the Meteorological Society of Scotland on "The Weather and Health of London," March 25; a course of four by Mr. Sidney Colvin, Slade Professor of Fine Art, Cambridge, on "The Amazons, a Chapter in the Study of Greek Art and Mythology." January 22, 29, and Feb. 5 and 12; and four by Mr. Reginald Stuart Poole on "Ancient Egypt in its Comparative Relations," on February 19, 26, and March 5 and 12.

The opening out of Savoy Place on to the Thames Embankment for carriage traffic is an improvement, establishing as it does a communication between the Strand and the river thoroughfare at a much-needed point. It seems a pity that the repeated alterations which have been made just at this part of the Embankment appear to have been due to a succession of afterthoughts. One result is the formation of a rather dangerous crossing for foot-passengers along the northern pavement of the Embankment, which might, with a little forethought, have been avoided.

The opening meeting of the Civil and Mechanical Engineers' Society was held last night (Thursday), at the Society's new rooms, 7, Westminster-chambers, when an inaugural address was delivered by the President, Mr. Henry Ellis Hill. The list of papers for the ensuing session is as follows:—Dec. 23, "The Patent Laws and their influence on Trade," A. T. Walmisley, A.M.I.C.E.; Jan. 6, "Account of Sombrero Island, West Indies, with description of submarine quarrying of phosphate of lime," R. Harkness Twigg, M.I.C.E.; Jan. 26, "Application of Hydraulic Machinery to Mines, Gas-works, Grain Warehouses, &c.," J. Coates, F.G.S., A.M.I.C.E.; Feb. 3, "Draining and Embanking, with regard to River Outfalls," William C. Street; Feb. 17, "Water-bearing Strata of the Thames Basin," A. F. E. Grant; March 3, "Steep Gradients v. Heavy Works," J. B. Walton, A.M.I.C.E.; March 17, "House Drainage and Sewerage," R. E. Middleton, A.M.I.C.E.; March 21, "Lifts for Warehouses, &c.," G. J. Child; April 7, "Rainfall," B. Haughton; April 21, "Drainage of North Lincolnshire," J. Henry Maughan, M.I.S.; and May 5, Annual Meeting. We are informed that Mr. G. A. Peyce Cuxson, of Maughan and Cuxson, London and Grimsby, has just taken the office of honorary secretary.

CHIPS.

Messrs. Jones and Willis have just completed a handsome polished brass lectern for the Rev. Mr. Biggs, of the Malacca Chaplaincy, Straits Settlement. The same firm have also just executed a handsome oak reredos for St. John the Baptist Church, Hulme, Manchester, for Mr. G. T. Redmayne, architect, Manchester; oak choir seats, &c., for Winshill Church, Burton-on-Trent; and a handsome Sicilian marble tombstone for Nailsworth churchyard, near Stroud, by direction of the Rev. Dr. Pratt.

The old school in Southgate-street, Gloucester, so well known for the gateway with the oriel window over, of Late Perpendicular work, is about to be restored, as a memorial of Robert Raikes, by a committee in London. Mr. Charles G. Wayland, of London, is the architect. We have been promised a view, with some particulars, which we hope shortly to give.

A meeting of the committee of the Byron Memorial was held on Monday at the studio of Mr. Belt, the sculptor who executed the work as far as it has gone. It was decided to at once proceed with the construction of the pedestal to be formed of the marble which the Greek Government had sent to England for the purpose, the cost of which, with its shipment, they entirely defrayed. The marble is a splendid specimen of Rosso-Antico. The pedestal will, it is expected, be finished in February next, and the whole cost of the memorial will amount to about £3,500.

A meeting of slate quarry proprietors was held on Monday at 3, Old Palace-yard, Westminster, the offices of Mr. A. M. Dunlop, the manager of the Oakeley Quarries. The following were represented—namely, the Penrbyn, Dinorwic, Talsarn, Dorothea, Penyrorsedd, Cilgwyn, Palmerston, Oakeley, Talywennydd, Cwmorthin, Festiniog, Diphwys Casson, and Craigdu quarries. After a long discussion, it was decided, in view of the improved demand, to raise the price of slates of certain size at an average rate of about 5 per cent. This increase to date from the 1st proximo.

The largest movable division ever fitted up has been supplied to Scotland by Messrs. Salmou, Barnes, and Co., of Ulverston, for St. Bridget's New Roman Catholic schools. It screens the altar from the schooroom, and is worked by the patent balance-weight motion, introduced by the firm, and can, by means of the ordinary long arm, be raised and lowered instantly. The dimensions are considerably in excess of ordinary revolving divisions or shutters, and a difficulty which has hitherto been a serious one in regard to divisions of large apartments is surmounted.

The Thames Bank Iron Company, of Upper Ground-street, London, S.E., have, under the supervision of Mr. R. S. Dunbar, one of the partners, most successfully warmed the Catholic Apostolic Church and Cloisters, Gordon-square, by means of two wrought-iron riveted saddle-boilers and a series of coils of pipes above the floor line, at a cost of about £337 10s. The committee should see about an effectual system of ventilation, now that they have got a good warming apparatus.

An inquest was held on Friday, at Eastbourne, on the body of a bricklayer from Hereford, named James Pritchard, who met with a fatal accident two days previously whilst at work on a church in course of erection at Upperton. It was stated that deceased was at work on the face of the west gable, which was built of Portland cement and shingle concrete, with a stone face and thin tile-brick backing. Into this, which had been laid the previous day, and was thought to have set, the putlocks of the scaffold were fixed, but the wall suddenly yielded and fell, carrying with it the scaffold on which deceased was at work. Mr. Schmidt, surveyor to the local board, having deposed to the good quality of the cement, and the supervision exercised, a verdict of "Accidental death" was returned.

The contract for constructing the proposed Hull, Barnsley, and West Riding Junction Railway and Dock has been taken by Messrs. Lucas and Aird, of Westminster. The new line will be 56 miles in length, or, including junctions with other railways, 66 miles. At the Hull extremity of the line will be a deep-water dock, having a water-area of 46 acres, and 34ft. deep, and surrounded by quays 80 acres in extent. For the dock, Mr. James Abernethy, F.R.S., of Westminster, is the engineer-in-chief, and Messrs. Oldham and Bohn, of Hull, the acting engineers. For the railway, the engineers are Messrs Wm. Shelford, of Westminster, and George Bohn, of Hull.

A new Wesleyan chapel was opened at Bovey, Devon, on Monday. Messrs. Underhill and Aggott, of Chagford, were the builders.

THE BUILDING NEWS.

LONDON, FRIDAY, DECEMBER 17, 1880.

ROYAL ACADEMY PRIZES.

THE distribution of prizes took place on Friday last, the 10th December, on the anniversary of the foundation of the Royal Academy. On taking the chair, the President, Sir Frederick Leighton, complimented the students on their competitive work, and offered some consolation to those who would not be called forward. Prizes had been awarded in every section except one, viz., the £10 premium for drawings from the antique, not because there was not considerable merit in some of the drawings submitted, but because in this competition, in which the students were allowed to select their own subjects and to choose the best of their work done within the year, unusual merit was expected. The President took this opportunity of impressing upon the students the great importance of a longer continuation of study in the antique school, and the unfortunate tendency in the school to get through their work there as soon as possible. The following awards were then made:—

Cartoon, G. K. Warren; painting figure from life, B. E. Ward; painting head from life, W. C. Wontner; extra prize, C. Sykes; copy oil painting, Lucy Schell; restoration of figure, Emmiline Halse; drawing figure from life, (1) W. M. Loudan, (2) J. C. S. Benham; drawing head from life, Rosalie M. Watson; extra prize, Emily Drew; model figure from life, (1) Oscar A. Junck, (2) R. T. Fulton; archi. drawing, (1) M. Allen, (2) E. G. Hardy; drawing of statue, Antique school, (1) W. Carter, (2) W. Ericksen; model of statue, not awarded; perspective, F. Miller; £10 premium, drawing figure from life, antique, W. M. Laudan; Armitage, (1) H. Paget, (2) L. E. Lawrence.

The subject for the travelling studentship this year was "A College, with rooms for principal, vice-principal, 40 students, chapel, library, lecture-room, dining-hall, kitchen, and offices, &c., to be erected on a piece of ground measuring 200ft. by 150ft. Drawings required: Plan of ground-floor, elevation, and perspective." Four designs were submitted, the studentship being awarded to Mr. W. J. N. Millard, for a design bearing the motto, "Alma Mater." Mr. Millard takes the longer dimension for his principal front, the accommodation being ranged round one large courtyard. The entrance-gate, with carriage and footway, is placed in the centre of the main front; the chapel on the right, the north, and forming the right wing, with the library as pendant on the opposite side. At the back of the court, with entrance porch, is situated the dining-hall, the kitchen and offices being placed in the basement below. The principal's residence is to the left of dining-hall, the vice-principal's on the right; the remainder of the buildings enclosing the court being devoted to the students' rooms. For these a sitting-room and bedroom, with small closet, is provided; each suite is placed on either side of a small staircase leading to the first floor. A corridor is carried round three sides of the court, apparently on ground-floor only. The students' closets are placed on each side of the main entrance, which seems to us to be a mistake; it would have been better for many reasons to have placed them at the extreme end of the right and left corridors. The footway entrance might also with advantage have been placed on the chapel side, the services in which are occasionally attended by outsiders. The style adopted by Mr. Millard for his elevation and perspective (a bird's eye view) is Late Perpendicular. The composition throughout is extremely happy and picturesque. The centre block, flanked by two octagonal turrets, is of good proportion and characteristic design; and the chapel and library on the extreme right and left balance one another, their respective destinations being clearly suggested; whilst the tower over the corridor, at angle of court, accentuates the greater importance of the chapel. There is a bold, original feature on the library side, which is worthy of note; this is a corner turret to the library, with a staircase leading to the gallery inside. Mr. Millard has carried up this turret above the roof to form a feature to the angle of his main front, and has thrown an arch, carrying a passage, across to the top of his library bow window, the lead-flat over which, therefore, can be got at for repairs when required. We do not remember to have ever seen this done before; the feature, as shown in his perspective, has the advantage of being picturesque and common-sense. The tower of the chapel is well designed, with five belfry windows and an open octagonal turret above.

The design sent in under the motto "Mens" takes also the long side as principal front. There are two internal courts with the chapel placed in the centre, and corridors round each court. The dining-hall is placed behind the chapel, the lecture-room and vice-principal's residence on the left, balancing the library and principal's residence on the right. The students have only bedroom and sitting-room, the latter being rather small; they open, however, one into the other, as at Keble College, Oxford. The space devoted to corridors is too great, and those on the right and left of chapel might well have been omitted. The elevation and perspective show a French origin, there being the lofty roofs and Norman windows of the 1st Renaissance period, without, however, the delicacy in design of that style. The windows—round arched and square-headed—do not agree in scale, and the whole work shows a lack of serious study.

"Nunc aut Nunquam" also takes the longer side (we might say longest, for he has exceeded the dimensions given, both in length and depth) for his chief elevation, setting back the centre portion so as to form a garden in front. There is one central internal court. The chapel is placed on the left, being brought out to the front of site, and is balanced by the principal's residence on the right. The dining-hall is placed at the back, with kitchen and offices occupying the remainder of the back elevation; had these latter been placed in the basement, the accommodation could have been easily provided for without passing the limit prescribed. The elevation and perspective denote a leaning towards French work of the 14th century. In the centre behind the entrance is a lofty tower, the precise use of which it is difficult to determine. The chapel is already provided with a bell-turret, so that no more bells can be required. We suppose, therefore, the usual plea for a water-cistern must be put in; but even that would not account for so lofty a tower, or for the large belfry-windows on each side.

"Sain et Fort," is the only design which takes the narrow dimension for its front. There is one large court, with the chapel in centre at the back. The principal's and vice-principal's residences balance one another on each side of chapel. The dining-hall in centre of left wing, with kitchen, &c., beyond, balance the library and lecture-room on the right side. This is the only design in which there are no corridors, and this accords with most university colleges; there are also no w.c.'s provided, in which respect it differs. The students' suites are, as in Mr. Millard's design, arranged in pairs on each side of the entrance and staircase; the windows of sitting-room face the court, those of the bedroom the street; this is better than in Mr. Millard's design, in which the windows of bedrooms have only a borrowed light from corridor on ground-floor. The style adopted for elevation and perspective is 15th-century English Domestic work, perhaps the best suited for buildings of this class. There is a want of study, however, in the design, and the central tower and the entrance apertures in it, seem to require greater elevation.

The subject for the perspective model this year was the vestibule of Somerset House. There was only one set of drawings sent in, and Mr. Frederick Miller, to whom the prize was awarded, has sent in the finest drawing which has been submitted for years. The subject was a peculiarly difficult one, as the competitors were required to take their view looking across the vestibule. Mr. Miller has selected his point of view with great judgment, projected his cornices and capitals with great care, and drawn in the various curves with a firm and artistic line. The specimen of sciography also, a portion of the Ca d'Oro at Venice, with its reflection in the canal, was well selected and carefully drawn.

For the measured-drawing medals subject, the inner passage between cloisters and Chapter House, Westminster, there were five competitors. The subject was a stiff one, owing to the figures and intricate detail in the Chapter-house doorway, which had to be drawn to a scale of one inch to the foot. Mr. Milner Allen and Mr. E. G. Hardy, to whom the 1st and 2nd medals were awarded, sent very accurate and careful drawings; they would have had a very serious competition, however, in the drawings bearing the number 101, if the author of this latter had been able to complete the half-inch scale drawings. The inch-scale drawing certainly seems to us to show greater delicacy in the delineation of the figure and ornament.

Of the other prize drawings, it is only necessary to call attention to the great excellence of the cartoon drawing, "Judith preparing to strike off the head of Holofernes," the finest which has ever been submitted in this competition, showing in the pose of the figure the arrangement and detail of the drapery, the greatest care and study, and general excellence in the drawing. The competition for painting of head from life and for drawings in chalk of head from life were both unusually good. The restoration of the Hermes (the marble lately discovered at Olympia) by a lady, Miss Halse, was unusually good.

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THE LEYTON LOCAL BOARD OFFICES COMPETITION.

THE designs submitted in the above competition and selected by the committee have been on view at the vestry-hall, Leyton, and we are now enabled to give our readers some idea of them. But the remaining six designs are hung on screens at Park House, Leytonstone—an arrangement that appears to have been found necessary from want of space in the former hall, though rather inconvenient for those who wish to compare the designs. The competitors invited to compete were Messrs. Bressey, Bishopsgate-street; Forge, Bennett's Hill; Hammack and Lambert, Bishopsgate; W. Smith, City; Wilson, Son, and Aldwinckle, City; Wimperis, Sackville-street; Knightley, Cannon street; Hill and Fletcher, Bow; Knight, Mile End; and Newman, Fenchurch-street. Two of these firms, Messrs. Hammack and Lambert, and W. Smith, declined to compete. The first premium has been awarded to "Mosaic," by Mr. Knight, of Mile End; the second to "E.C.," by Messrs. Wilson, Son, and Aldwinckle; and the third to "Utility," Mr. Wimperis, of Sackville-street. These three designs we may first examine. "Mosaic" has placed the clerks', surveyors', and committee-room on the ground-floor; the entrance is at the corner between the two frontages, and another entrance is provided near the inspector and collectors' offices. Two corridors at right angles, joining near the main entrance, give access to the offices; these are hardly well-lighted, and the small passage cutting off a slice of the inspector's office to give access to the collector's room is certainly worse off in this respect, and does not make a very desirable arrangement. One noticeable feature in the author's plan is the external and isolated position given to the lavatories, &c., which form a small building at the end of one of the corridors. The clerk's private office, though communicating with the public office, is small, and scarcely appears large enough for a small committee, but the general committee-room is of good size, and is located conveniently near the clerk's and surveyor's offices, and near the entrance. All the offices can be shut off when necessary from the main entrance, but we think the best mode has not been devised of obtaining a good approach from the vestibule; the doorway placed askew appears too near the stairs, and the shape of hall is not the most pleasing. The board-room, 49ft. 6in. by 31ft. 6in. and 20ft. high, occupies the area over the clerk's, collectors', and committee-rooms, and is lighted by a wide flank and end windows. The landing looks narrow. The increased height required for the board-room has been utilised to obtain 2 floors of small rooms for the use of caretaker, and as a waiting-room. We cannot express our approval of the design externally, which is in a too florid kind of Italian for vestry purposes, and of a somewhat music-hall type. The corner diagonal porch forms a lobby, which is carried up as a tower, and is finished by a lofty roof, though its utility is questionable, and as an architectural feature, we must withhold our praise from it. The ornamental console cornice at the top of the tower and the pilasters would have been far better omitted, and the decorative detail is of too tawdry a character. The author has made up for these defects by attention to sanitary requirements, which have been generally well met, as in the isolated lavatories and mode of warming and ventilating, Perkins's system being used for the former, and Tobin's for the latter. The materials proposed are white gault brick and Portland-stone dressings for the main front, and plain stock brickwork, with red gauged arches, for the back and side fronts. We do not believe that "Mosaic" can be carried out for the sum named, namely, £4,000, if we cube the building at 10d.—not an unusual price.

"E. C." sends two sets marked A and B. The second has been chosen. It is in Queen Anne, and displays some fair symmetrical planning. The entrance is central to the main front, the clerks' offices being on left side of the corridor, and the surveyor's on the other; at the rear end is the main staircase, with the collector and inspector placed on the left hand, and the conveniences on the other. The board-room occupies the whole upper part of the front building, and the committee-room is placed in rear on one side of landing. The principal elevation is towards Leyton-road, and a wide gabled projection is obtained at the side, pronouncing the hall, wide bay windows and dormers being the chief features in the front. Stock-brick, faced with red or white Suffolks, is proposed, relieved by Portland stone cornices, &c. The alternative design shows a half-timbered gable projection to the hall, with wide mullion window, which projects over an arcade below, and we observe a slight variation in the planning. It would hardly appear that either of these designs could be executed for the sum named.

"Utility," the third premiated design, is, on the whole, the best of the three. There is a central porch-entrance towards the Leyton-road, a spacious corridor well lighted, and a good staircase at the side. The clerk's offices on one side, and the surveyor's on the other, form corresponding halves of the main building; behind, fronting the side road are the offices of the collector and the inspector, with their own separate entrance. A desirable point in the plan is the intercommunication that may be made between the sanitary and collector's offices. The board-room, 52ft. by 28ft. 6in., occupies the entire front building on the first floor, and a gallery is shown on the inner side, approached from the back staircase; the entrance-landing to hall is spacious, and well lighted, and the waiting, committee and cloak-rooms convenient. The hall is lighted on three sides, the front having a wide bay over the arcaded entrance. While the planning shows a convenient grouping of the official departments, the design, represented by a carefully-drawn ink perspective, is treated in a characteristic style of Renaissance, broadly and plainly disposed in its main features, and displaying a dignified exterior of an official type. Its high roof and pronounced entrance are well managed, and the author has avoided excessive ornamentation. Stock-bricks, faced with white Suffolks, are intended for the walls and pilasters, and stone is only introduced for the caps of pilasters, sills, and copings. Comparing these features with the other designs, we may fairly say the design is less expensive than either of those we have already named. Corner fireplaces are introduced in the offices, and these are carried up as terminals to the angle piers.

We may now examine the unsuccessful designs, which are at Leytonstone. "Triangle in Circle," is in a kind of Italian, freely treated, with corner entrance and tower, and a large entrance-hall; from this corridors run in two directions along both fronts, the clerks' offices being in the rear, and the surveyor's in front. The hall arrangement is decidedly better than the awkwardly-shaped one of "Mosaic," but the official department might be improved. The board-room, 54ft. by 36ft., occupies the whole of the upper floor of the main front, and extends from back to front, approached by the angle staircase. "Architect" is a decidedly meritorious design, and as far as we can see, ought to have been premiated. It is designed in a well-treated official Italian, an order of pilasters on the upper story standing on rusticated piers below. The front is dignified but simple in outline, with a high roof. The arrangement is well planned, and consists of a large main block and another parallelogram of smaller size behind; there is a central corridor entrance from the front, leading to another cross corridor at right angles in the rear, forming the side entrance. The stairs are placed at the junction and are well lighted. On each side of the front corridor are the offices conveniently approached, while the side entrance gives a separate access to the hall above, and to the collecting and sanitary departments in the rear. The board-room, 50ft. by 30ft., occupies the whole area of the main block above, and has a good landing and approach. A large sepia perspective accompanies this set. "Salus Populi Suprema Lex" is a Queen Anne design; in its general features we might mistake it for a church, as there is a lofty corner tower with low spire seems to overpower the building. The planning is extravagant; a large hall, 56ft. by 23ft., occupies the central area, around which are grouped the offices, and the author has overlooked the essential point in vestry arrangement. "Questo E. Mio," shown by a well-drawn ink perspective, is in a vigorous Queen Anne style of brick, with a high roof. The planning has merit; the offices are symmetrically disposed on each side of a central entrance, and an inner hall and staircase of dignified size form the centre approach to the board-room above, which occupies the entire frontage, and is 65ft. by 29ft. The collecting and sanitary offices are in the rear. "Experto Crede" is too confused in arrangement to bear inspection, and the design is rather too villa-like and broken in outline—a perspective, showing red brick as the chief material, accompanies the design.

We cannot avoid the remark that a better selection might have been made, and that the unfortunate competitors have some ground for dissatisfaction. Many of the designs exceed the amount set down, which is to include boundary walls and every requisite except furniture. There was nothing in the instructions to architects to guide them in the disposition of the several departments, though a general idea of the accommodation required was furnished. One important point is the separation of the official departments from the board-room, which might be used for other occasional purposes, and this ought to be attended to in the selection. Of course, the selected design will be subject to the approval of the Local Government Board.

INSTRUCTION IN DRAWING IN FRANCE.

THOSE engaged in art instruction will read with some interest the recent report of the Commission upon the instruction in drawing in the French schools. Various commissions have been appointed to reconsider the system of drawing in force in the establishments of the French universities. Inspectors of drawing were first appointed by the Minister of Public Instruction to inquire into the present state of affairs in the *lycées* and *colléges*, and the result was that they all reported the urgency of reforms, and a special Commission was afterwards directed to prepare syllabuses of instruction. The report proceeds to speak of the alterations. One of the fundamental propositions of this report is that, contrary to long usage, "precedence should be given to the training of the eye before that of the hand, a method by which young people would be induced to consider primarily the essential meaning of the forms." Pupils are recommended to commence their studies with linear or geometrical drawing, and the Commission suggests that opportunities should be afforded the pupils of practically applying the principles they have learnt, such as by lessons on elementary ornament, so as to interest them in their work. The imitation and appreciation of right lines would be followed by curves, and later on by the "representation of objects involving the simplest geometrical drawing and the elements of perspective." Students of a more advanced class are recommended to practice geometrical and shaded perspective representations of solids and of common objects. They are required to make drawings from ornament in relief taken from conventional objects, such as mouldings, classic honeysuckles, bas-reliefs, inspired by examples of living forms, such as leaves and flowers, but attempts to imitate the human figure are discouraged. As in England, there are also some in France who object to initial geometrical drawing, and say that those who have a facility in handling the pencil, should be taught from infancy to exercise it in copying models, casts, and engravings of antique sculptures of the human figure. On the contrary, the Commission insist upon the necessity of a primary or geometrical course of teaching. One of the distinguished members concludes rightly enough that as art is the object of drawing, art should be the aim.

Before knowing how to draw a line and to recognise its value an affectation for ideal beauty is set up, and he asks whether there is not danger in appealing to the creative faculty and independence of sentiment, when it would be wise to attend to the discipline of the rational faculties. It undoubtedly should be the main end of schools of design and drawing to give a child so much of the power of drawing lines with accuracy as will enable him to become precise and practical, and serve him some useful purpose in after life.

The report speaks with considerable clearness on this point; it advocates the establishment of a fixed curriculum of progressive drawing, not a system founded on personal preferences. Drawing from the human head and the teaching of hatching, stumping and stippling are objected to until such a time when the pupil may find himself justified against confusion between the mechanical imitation of an example, and the paramount duty of faithfully reproducing its essential characteristics. The system of instruction recommended for adoption in France, is based upon similar experiences to our own. It was soon found that to teach the principles of applied art for the purpose of design, the very elements and art of drawing lines grammatically had to be previously acquired. Right lines, then curves, and afterwards freehand copies of leaves were absolutely necessary before the pupil could express with correctness and precision any solid forms which were afterwards given him. As regards the higher classes, the French programme proceeds to figure-drawing, and graduated studies of architectural fragments and decorative figures. Landscape drawing from copies and sketches follows, and it may be noticed as worthy of remark that photographs are rigorously excluded as examples to copy, except in respect to photographs of pen and pencil drawings of great masters. Preceding commissions have urged the same opinion, founded no doubt on the negative character of such productions.

It is some satisfaction to find the programme agrees in every principle with the system of drawing instruction inculcated among ourselves, the fundamented conclusions of which are an initial acquaintance with the geometry of drawing, followed by progressive stages of instruction to the higher forms; and an aim to impart the elementary principles of art which may be called into the service of after-life with decided advantage, and may also serve to impart to pupils a logical education in art matters. We have remarked on reviewing some of the artistic exhibitions of late, as well as those of some of the board-schools, the large number of copies from prints and other indifferent sources of figure subjects, many of them of a miserably puerile and trashy kind, showing that the principles we have been discussing have not as yet found so widespread a reception as we could have desired. *Copies* of pictures of the class we have mentioned should be excluded from exhibitions of this kind, and the inculcation of a more healthy art among the masses would quickly follow.

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MATERIALS AND CONSTRUCTION.*

ANOTHER new treatise has been added to that popular and useful series of professional text-books known under the name of "Weale's Rudimentary Series," but now published by Crosby Lockwood and Co. The subject of the new treatise is one which, though it can claim no novelty, may be regarded as forming the very foundation of the arts of architecture and engineering. Tiring and wearisome as must be the name to the artistic enthusiast of the profession, the science of construction must always occupy the largest share of his attention. Mr. Francis Campin, C.E., the author of the present treatise, is also the compiler of other useful books of the same class, and his "Iron Bridges, Girders, and Roofs," published in this series, is known to many students of the profession as one of the simplest expositions of the principles of structures whose very names often create despair in the mind of the beginner. That the author is well qualified for the task he has now accomplished will be readily admitted. The work enters directly into the subject, and, of course, the reader will find little new in Mr. Campin's treatment, as the ground has been so thoroughly travelled over by former authors that there is little fresh that can be taught; indeed, the same may be said of all scientific subjects, more or less, especially in the domain of mathematics and construction. To do justice to the author, however, he has thrown some light on difficult problems, and has avoided algebraical symbols wherever simple forms of equations could be used; and in this respect we think Mr. Campin's treatise will be welcome to many students of engineering and architecture who would otherwise have been debarred from using it. The work, as the author says, is "especially designed for those readers who desire to become thoroughly acquainted with the theories of structure and the practical application of results in the simplest way." Only cases likely to occur in everyday practice have been selected to illustrate principles, and no reader need be deterred by the calculations introduced. The first chapters explain terms and treat of the elements of matter, elasticity, internal and external forces. We think this part might, perhaps, have been curtailed a little or confined to the more particular questions of elasticity, external forces, and the like. The diagrams illustrating the action of external forces are very clear, and the dullest comprehension might be made to understand the complex action taking place in the beam subject to cross strain, and the meaning of "neutral axis" or "layer" after such ocular proof. The same method of explanation is given to show the action of shearing strain in crushing, &c. The explanations given as to the correct use of the term "permanent set," which clearly applies to molecular change, and not to subsidence and other external settlements, are usefully introduced, and we quite concur in the remark that the working strength of material should be taken in some proportion to the elastic limit of resistance, and not to the ultimate resistance of the material. Less satisfactory to our minds are the definitions given of the two classes of resistance. These are undoubtedly (1) the resistance due to cohesion or the strength of material, and (2) the resistance due to the weight of material to overturning or sliding; the first of these forms has to withstand the force of tension or crushing, the second kind of resistance, due to gravity, comes into play to overcome overturning or external forces, as well as the friction of the mass upon its bed. The moments of force are clearly set forth, as also the problems of forces acting at a point, and the action of framed structures. The bending stress and moment of resistance in a beam are incomprehensible to the beginner; but when once he clearly understands the manner of obtaining the centre of gravity of any section and the equality of the opposite forces acting in it on each side of the neutral axis when a cross stress is exerted, half the difficulty of understanding the phenomena of transverse strain vanishes. The author devotes some space to the consideration of this, and illustrates it by an actual case in which numerical values are attached to the terms. A section of a wrought-iron beam is taken and worked out, a working strain of 4 tons per square inch being assumed. A good illustration of the neutral axis and the moments of strain and resistance is given by regarding the former as the fulcrum, about which the forces act. Having investigated the nature of internal resistance, the writer goes on to explain the laws of external forces applied to beams and cantilevers when loaded in various ways. One very important case not usually found in books, is given, namely, when a girder carries a load distributed in the form of a triangle, as when the main girders of a bridge are not square with the abutments, and a road runs obliquely below, the load created by the small cross-girders distributes the load unequally, and it is necessary the engineer should calculate accordingly. Vertical stress on the web of a girder is considered, also the resistance to shearing force. A useful observation on webs is made: "In all parts of built structures, such as wrought-iron girders, it must be remembered that it is at the weakest part, the joints, that the areas have to be fitted to the strains."

Framed structures are thoroughly discussed, and the strains are found by the parallelogram of forces. Open triangular and trellis-girders, and other forms of braced structures, are fully considered. The methods of determining the strains in roof-trusses are gone into, and will be found of service to the student; but the graphic system of Maxwell, and other authors, in which a distinct stress-diagram is had recourse to, is not explained.

Braced or connected columns, such as those forming the piers of bridges and jetties, are treated in a practical manner by a worked-out example in plain figures, and if the method here shown of finding the stability were more generally resorted to, we should seldom hear of Tay Bridge disasters. The pressure of wind upon the structure (taken at 40lb. per superficial foot) is considered, and the effect on the diagonals between the columns, after which the horizontal strain tending to cause the columns to slide, and the effect of suddenly retarding the velocity of a train by the application of brakes, are taken into account; the latter would cause a longitudinal strain on the bridge, depending for its intensity on the skidding of the wheels. Other details of bridge construction, such as the floor-bracing and attachments, have not been overlooked, and in most instances, practical examples of the calculations are furnished. Very useful advice, also, on the proper distribution of the bracing and joints of structures of this kind follows, the value of which cannot be overrated.

Iron in its application to arched structures is discussed in another chapter, and the author points out the mathematical principles involved in their design. Of course, the main point is that the line of compression, or, more correctly, line of pressure, comes within the depth of arch, so that after the loading is considered, the form of the iron rib has to be determined by graphic means. The effects of unequal loading must also be taken into account, and the principle of moments may be applied to find the thrusts. Suspension-bridges, columns, and struts, joints and connections, and other subjects discussed are important. We find some useful observations, too, on riveted joints. Chapter XII., on the "Practical Application of Formulæ," enters into an hypothetical case of a railway-bridge, and shows how the several girders and parts have to be designed. It is, in short, the working out of an example in all its details, and will be found of much use to the student who cares to study the *modus operandi*, following which the particulars of a specification are furnished.

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* Materials and Construction: on the Strains, Designing, and Erection of Works of Construction. By FRANCIS CAMPIN, C.E., &c. London: Crosby Lockwood and Co., Stationers' Hall court.

To the architectural student the chapters on stability, including the treatment and design of piers, buttresses, counterforts, retaining walls and arches, are of the utmost value, and, in fact, in order of constructional importance, might be studied before the earlier chapters. The calculations of the moments is clearly set forth, and the application of the parallelogram of force is shown. The formulæ given also for determining the stability of masonry arches will be found of use, as they are explained by numerical examples. The concluding chapters treat of piers and foundations, building materials, oblique arches, &c., and some useful tables are appended. No better exposition of the practical application of the principles of construction has yet been published to our knowledge in such a cheap comprehensive form, and those who intend to qualify themselves for the tests of proficiency instituted by the principal societies cannot have a better guide.

THE ARCHITECTS OF THE ITALIAN RENAISSANCE.*

(*Continued from page* 670.)

THE two brothers Giuliano and Antonio di Sangallo flourished about this time (1443-1517). They were sons of an architect, Giamberti, whose works have not been greatly praised, and, being educated as engravers, ultimately turned their attention to architecture. The principal works of Giuliano were the cupola of the church of the Madonna di Loretta, at Rome, built by order of Alexander VI., the fortifications of Ostia, the castle of Montefiascone, for the Duke of Valentino, and he latterly superintended the building of St. Peter's at Rome under Leo X. His disinterested motives, and his affection for his great patron Lorenzo de' Medici, are exemplified by the following story narrated by Milizia:—After completing the fortifications of Ostia, he journeyed to Naples and presented a magnificent model to the king for some work at Castle Nuovo, which so pleased the monarch that he presented him with horses, clothes, and a silver cup containing one hundred ducats. Giuliano, however, refused to accept them, stating that he was still in the service of Lorenzo de' Medici, and the king, surprised at his noble independence, allowed him the choice of whatever pleased him, and he accordingly chose some fragments of antique sculpture, which he presented to his patron Lorenzo on his return to Florence. Antonio or Sangallo the Younger has left many excellent works as evidence of his talent, and his designs for St. Peter's at Rome were replete with originality, and differed greatly from those of Bramante. The most ingenious work of this architect was the well at Orvietto, which is of great depth, and has two spiral staircases,—one inside the other,—descending to the well, so that one set of mules laden with waterskins might be descending while the other set were ascending. Sangallo began the Farnese Palace when Paul III. was cardinal, and when the building had reached the roof, the Pope, anxious to have a cornice which, in beauty and richness of design, should eclipse all former efforts, instituted a competition among all the able artists in Rome, but even the Pope's infallibility could not ensure a satisfactory termination to it, for the decision, as in nearly all modern competitions, was as absurd as it was unjust. Sangallo competed, but his design was set aside for one by Melighino, formerly the Pope's groom, and he was unable to restrain his righteous indignation at this unfairness, and explained to the Pope that this man was a mere mountebank of an architect. "We wish Melighino," said the Pope, "to be really an architect, and will therefore take care to provide for him." But the groom did not carry it out after all, and the execution of it was entrusted to Michael Angelo.

Simone Pollainolo (born 1454, died 1509) was a Florentine by birth, but he visited Rome at an early age, and there acquired a strong passion for architecture. He superintended the erection of the Strozzi Palace at Florence, which was designed by Cronaca, and built the beautiful little church of San Francesco, on the hill of San Miniato at Florence, which has, however, been over-praised, on account of the notice taken of it by Michael Angelo, who surnamed it "La Bella Villanella."

Sansovino (born 1460, died 1529) was the son of a peasant, and became famous in his early years for sculpture, but especially for the two tombs in the church of Santa Maria del Popolo at Rome, and afterwards became equally noted for his architectural works. He built the beautiful Capella del Sagremento at Florence, adjoining the church of San Spirito, and as the compartments of the vaulting were not placed centrally over the piers, his clients found great fault with him, but he brought ancient examples to justify his design, and so silenced all criticism. The west façade of the Duomo at Florence was then, as at the present day, unfinished, and Sansovino placed against it a false façade of wood, of admirable design; but as the design was of the Classic type, with Corinthian pilasters, it is, perhaps, well for the harmony of the edifice that it was never executed. Sansovino made a design for a magnificent church at Rome, his drawings being preferred before those of Raffaelle, Sangallo, and Peruzzi, but the execution eventually devolved upon Sangallo, who was a better constructor than his contemporary. The library of St. Mark, at Venice, has, however, immortalised his name, and the building has a rich Doric order on the gsound-floor, with a graceful Ionic above. Venice has, more than any other Italian town, been richly embellished by this architect. Having resided nine years in Portugal, at the invitation of Leo X., he returned to his native land, laden with rich gifts, and eventually built himself a villa near his birthplace, Monte Sansovino, where he spent the remainder of his life.

We have now to consider the character of a man who combined all that was manly and noble, with a delicacy and refinement of thought which have seldom been surpassed. Leonardo da Vinci, the great painter, sculptor, architect, and anatomist, who was skilful in music and poetry, and added to a beautiful exterior the charm of graceful manners, was born in the Castel da Vinci at Florence. We are not acquainted with many of his architectural works; nevertheless, it is evident from his writings that he had studied the subject, and he was employed by Ludovico Sforza to conduct the waters of the Adda to Milan, and he made the canal of Montesano navigable for 200 miles. It was his habit to write on whatever he executed, but as all his writing, like Hebrew, is from right to left, it is not easily deciphered. His ingenuity was marvellous, and when the king of France, Louis XII., visited Milan, he fashioned the model of a lion, which, when the king was seated in the great hall of the palace, moved towards him by the aid of machinery, and on arriving at the throne, it suddenly stopped, tore open its breast with its claws, and displayed on its heart the royal arms of France. Jealousy for his contemporary, Michael Angelo, caused him to quit Italy, and at the invitation of Francis I. to visit France, but he was taken mortally ill at Fontainebleau, and the king immediately set out to see him. On the arrival of the monarch, Leonardo endeavoured to rise to pay him homage, but the exertion hastened his death, and he expired in the king's arms.

Raffaelle d'Urbino (born 1483, died 1520) was the son of Giovanni Sanzio, a painter of some note, but whose name was eclipsed by that of his illustrious son. One of the first works of Raffaelle was the façade of San Lorenzo at Florence, for Leo X., and the palace of the Pandolfini. The stables of Agostino Chigi, in the Strada Longara, Rome, were designed by him; and here we see the coupled pilasters which were a constant feature in Raffaelle's designs; but this building is too much broken up to have a wholly satisfactory effect. He was one of the competitors for St. Peter's, and in his design divided the Latin cross into nave and aisles, with recessed chapels in each bay. The arms of the cross were semicircular, and were ornamented with numerous columns and pilasters. The idea is said to have wanted grandeur, and, in fact, it required an almost superhuman genius to master all the difficulties which were connected with the construction of so vast a work. But although Raffaelle's architectural works were great, his powers of painting were far greater, and he was treated with every mark of reverence and respect, and after endeavouring to imitate Michael Angelo in sculpture, in which, however, he failed, especially in the nude, he devoted his whole time to painting. He died at the early age of 36, and was buried in great state at Rome, Cardinal Bembo writing his epitaph, which has been thus translated:—"To the memory of Raffaelle. Nature feared to be conquered by him while living, and to be annihilated at his death."

Let us now briefly consider the strange and varied life of Baldassare Peruzzi (born 1481, died 1536), who was the son of Antonio Peruzzi, a Florentine noble. The civil wars which were then raging in Italy, caused his family to be left in great distress and poverty, and Peruzzi accordingly journeyed to Rome, and devoted himself to painting and architecture. He, like his illustrious predecessors, was engaged in superintending the building of St. Peter's, and made some improvements on Bramante's original design. The peculiarity of this design was the semicircular termination to each arm of the cross, and the porches were also semicircular in plan, with three doorways in each, and the high altar was placed centrally. This arrangement has been much commended, and has been partly carried out, but the cupolas which covered the whole have not been executed. Peruzzi built, and afterwards decorated, the palace at Longara, now called the Farnesina, built originally for Agostino Chigi, and he has been especially praised for the ornamentation of the loggia, which is in such accurate perspective that Titian is said to have climbed up to ascertain whether the corbels were real or painted. At the sacking of Rome in 1527, when the Spanish soldiers were plundering the City, Peruzzi was seized, and, on account of his aristocratic person, was thought to be some Italian noble, but was freed on stating his profession,—not, however, before he had been barbarously treated by the soldiery, and he arrived eventually at Siena, naked and wounded, having been robbed of his clothes on the road. His stern refusal to enter the service of the Pope, who wished to employ him at the siege of Florence, shows that a spark of patriotism existed in him, and that the Papal rewards were incapable of corrupting him. Besides the Farnesina already mentioned, Peruzzi built some other palaces in Rome, among which may be mentioned the Massimi palaces, and that which bears the name of the Ossoli family. It is stated that his extreme modesty prevented him from ever asking a reward for his labour, and he consequently died in poverty, his only support being his salary of 200 crowns as architect to St. Peter's. He lies buried in the Pantheon beside the illustrious Raffaelle, whose works he had studied, and in some instances surpassed.

The last three men whose lives we have been considering, were almost as much painters as architects, and, in the case of Leonardo and Raffaelle more so, and it has been before remarked that this was not an uncommon occurrence in the fifteenth and sixteenth centuries. In the present day, however, we have no great artists who have attempted to combine the two. We frequently find an architect who devotes his leisure to painting; but where can we name a painter who has shown any aptitude for the nobler art of architecture, which not only requires an artist's eye to orginate the design, but a constructor's skill to carry that design into effect, and employ the materials most suitable in each particular case?

It would be well if the importance of architecture were more fully appreciated, for nothing shows the character, the wealth, or poverty of a nation, more clearly than the style of its architecture. "I cannot touch the lute," said Themistocles, "but I can make a small town a large city": and were the aristocracy of England and the wealthy merchants of London to take that pride in architecture which prevailed among the nobility of the Italian States, and the princely merchants of Florence, we might then find more earnest desire on the part of our architects to execute their work with that painstaking care and devotedness of which we see so many proofs in bygone times.

We are now in the full tide of the Renaissance, and all Italy has felt the influence of this stirring up into artistic life, which awoke the latest energies of the sixteenth-century artists. The bright and comely flower of Renaissance art has been nurtured and cultivated by rich and poor alike; warmed by the sun of genius, and gladdened by the freshening dews of intellectual effort, the tender stem has grown vigorous and healthful, and although not possessing the same energy as the hardier plant of Gothic art which preceded it, but partaking more of the character of a hot-house plant, it has, nevertheless, a charm and gracefulness of which antecedent artistic efforts were often sadly destitute.

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* A paper by W. Hilton Nash, read before the members of the Architectural Association, on Dec. 3rd.

Michele San Michele (born 1484, died 1559), was the great military architect of this age. He was taught the elements of architecture by his father Giovanni and his uncle Bartolomeo, who were both architects. He was sent by Clement VII., after having completed his studies, to visit and report upon the fortresses in the Ecclesiastical States; and having accomplished this, he started again to inspect the fortifications of Venice, for the purpose of improving his knowledge of these subjects. Verona, the birthplace of San Michele, has been embellished more than any other Italian town by the works of this artist, and the bastions which he built to fortify the town were on an entirely new principle, which has been adopted and improved upon by Vauban and others; but it was this architect who in reality invented the triangular or pentangular bastion with plain fosses and flanks, which doubled the support, and thus entirely superseded the ancient square and circular bastions. His fortifications at Venice were on an enormous scale, and those who were envious of his popularity suggested that the firing of the heavy artillery required for the defence would reduce his forts to ruins, and Sanmichele accordingly ordered the largest guns procurable to be brought and placed in the forts and all to be fired simultaneously. Many of the timid inhabitants fled when notice was given of his intention, and a terrific firing took place; but after it had ceased, not a crack or fissure was discovered in the fortress, and the fears of the multitude were converted into exuberant joy. He built the Porta Nuova, the Porta del Pallio, and the Porta San Zenone at Verona, and also the exquisite Pellegrini chapel, a work of small dimensions, but of the highest excellence. The stone of which it is built is found in the quarries of Verona, and is called "Bronzina," as when working it sounds metallic like bronze. He built five palaces at Verona, of which the Palazzo Pompei is the most harmonious in design, possessing a dignity of repose which is one of the essential elements of a Classic composition.

The universal genius of Michael Angelo (born 1474, died 1564), cast such a refulgence over the tracts of Renaissance art, in painting, sculpture, and architecture, that all other artists seem lost for a time in the vigour and grandeur of the work of this great man. He did not devote himself vigorously to architecture till he was forty years of age, and his masters were his own talents, aided by his observations of ancient edifices. Two of his earliest works were the Medicean Library at Florence, and the second Sacristy at San Lorenzo, which is undoubtedly one of his finest designs. Michael Angelo also made designs for several gates at Rome, but the only one which he erected was the Porta Numentana, or Porta Pia, as it was named after Pope Pius IV., during whose pontificate is was built. He designed the Strozzi Chapel at Florence, and made many other designs for churches, few of which, however, have been preserved; and it was his constant habit to destroy any drawings which did not justly convey to paper the grand conceptions of his mind. His work at St. Peter's at Rome gives evidence of the sound knowledge of construction which he possessed, but his ornaments and mouldings are none of the purest, being frequently so whimsical as to border on ugliness; and he used sometimes to confess, perhaps only from modesty, however, that he knew nothing of architecture. It is well known that when pressed by Pope Paul III. to accept the office of architect to St. Peter's he agreed to take it on condition that he received no salary, stating he did so "for the love of God."

Galeazzo Alessi (born 1500, died 1572) having studied mathematics, and shown an aptitude for mechanics when a youth, after perfecting himself in these subjects, repaired to Rome, to be under the tuitien of Michelangelo. His works in Genoa were very numerous, including the Palazza Spinola, in the Strada Nuova; a handsome palace in the Porta Romana, for Signor Laoli; and the villas for Count Pallavacini, above Zerbius, and Signor Giustiniani, in Albaro. His church on the Carignano Hill, at Genoa, is sufficient in itself to make his name illustrious.

We have now to consider the lives of the two last great architects of the Renaissance, Vignola and Palladio. The former, whose real name was Giacomo Barozzi, was the son of Clementi Barozzi, a Milanese gentleman (born 1507, died 1573). He studied painting at Bologna, but eventually applied his mind to architecture, and produced a treatise in his later days, the outcome of his early studies in Rome, which has done more to perpetuate his name than all his works in stone and marble. He built many churches in Rome, and was employed by Pope Julius III. and the Cardinal Alessandro Farnese, who engaged him partly in the erection of the Farnese Palace. The celebrated Caprarola Palace, however, gained him the greatest encomiums, and eclipsed all his former efforts in ecclesiastical architecture. After the death of Michael Angelo, Vignola was appointed architect of St. Peter's, and erected two cupolas on either side. His fertile invention often led him into extravagances, and induced him to depart from the correct forms and outlines of the ancients.

Palladio may be considered as the last great architect of the Renaissance. His finest ecclesiastical work is the church of the Redentore at Venice; but the work which has brought most renown to his name is the Basilica or Town-hall at Vicenza. In this city Palladio reigns supreme. Whichever way we turn we meet with his works, many of them finely conceived, but executed in plastered brick, so that their true grandeur cannot be justly estimated. The peculiarity of his style were lofty columns running through two stories, pedestals without panels or raised mouldings, simple architraves, doors, windows, and niches of simple design, and crowned with unbroken pediments. The *Quarterly Review* and many amateur critics have endeavoured to prove that Palladio's architecture was false in principle, since the internal arrangements did not always accord with the external effect; but we must remember that Renaissance architecture never aimed at this, external symmetry being its chief characteristic, while Gothic architecture had for its primary object the exposing of the bones and muscles of the structure to which it was applied. For the beauty of Palladio's architecture we must look to his façades, which are bold and imposing.

In the latter days of the Renaissance the art which had once adorned churches and palaces confined itself almost entirely to the interior decoration of the dwellings of the nobility, and the Baroque style succeeded the bright and cheerful efforts of the earlier designers. This universal decadence was the precursor of utter annihilation of all genuine æstheticism, and with the close of the sixteenth century the curtain fell on all true art.

THE AMERICAN INSTITUTE OF ARCHITECTS.

THE Fourteenth Annual Convention of the American Institute of Architects met in Philadelphia on November 17 and 18. Mr. Walter was again elected president; the board of trustees was slightly changed, and the profession showed a grateful remembrance of Mr. Bloor's dilligence and fidelity by again electing him, after a lapse of some years, to the responsible post of secretary, while the treasurer's duties are to be discharged by Mr. O. P. Hatfield. The chief work of the convention was the consideration of the resolutions offered a year ago at the convention in New York, looking to a modification of the relations between the Institute and the chapters of which it is made up. These resolutions seemed to suggest an entire separation, letting the local societies manage their own affairs, and leaving the Institute, as an independent national organisation, to arrange for the annual conventions, and, through its board of trustees acting as a permanent council, to attend to such matters of general import as might require action in the interval between one convention and another. This change was strongly recommended by the Boston chapter, in a series of resolutions adopted in April last, as our readers may remember, and sent about to the other chapters for their consideration. The convention discussed the question with great care, and unanimously adopted a solution of it at once radical and conservative, accepting the substance of the new scheme, while adhering in form to the present arrangements. A new constitution was adopted, by which all that remains of an organic connection between local societies and the national body is this: that the president of each chapter shall be a Fellow of the Institute, and shall be, *e hoc officio*, a vice-president of the Institute and a member of the board of trustees. In every other respect the local society is free to do as it sees fit, and has neither duties nor privileges. The institute, on the other hand, is equally independent, receiving as members those who may choose, or be chosen, to take part in a national organisation, individually, whether they adhere to the local organisation or not. Two grades of members are still recognised, Fellows and Associates; but both alike are admitted to vote on all questions. The only difference is that the Fellows pay higher fees, and are alone eligible to office. Fellows are to be elected by vote of all the members of the Institute, while in regard to Associates, the present rule, of election by the board of trustees, is to be maintained. In both cases, of course, provision is made for nominations by responsible persons. It is proposed that the number of Fellows shall be restricted to 70, so that election to this body, which can then only take place upon the death or resignation of one of their number, shall be of the nature of a personal distinction awarded by the profession at large.

THE SITUATION AND CONSTRUCTION OF DWELLING-HOUSES.

THE first of a series of Saturday-afternoon lectures to members of building-societies was delivered at the Parkes Museum of Hygiene last week, by Mr. E. C. Robins, F.S.A., who introduced the subject of dwelling-houses by suggestions as to situation and construction. About 60 persons were present. In treating of site, the lecturer said he should take it for granted that his hearers' choice was comparatively limited to the near neighbourhood of the City, or within easy access thereto. In the selection of the site, or of the house, if already built, care should be taken to see that the road ran nearly north and south, so that the principal windows and doors would face east and west, and the street in front, or the garden at the back, would always partake of whatever southern sun our ungracious climate afforded. If a corner site were selected, three sides of your house would always be exposed to wind and weather. By the choice of the southern corner, much fuel would be saved in the maintenance of internal warmth. The consideration of the subsoil and stratification of the earth upon which a house stood was important. A damp site made a damp house, not only by the surface dampness of the surrounding ground, but by the ground-air, which was drawn under and into the house by the fires. It was a mistake to suppose that impermeable soils were drier than those which were permeable. Where a pervious soil, like gravel or soft limestone, was sufficiently deep, and so placed as to allow of the free passage of water through it, a house built upon it would be dry and healthy. If, however, the gravel was situated in a basin of clay or other impervious soil, it would only be fit for building upon when artificially drained. Impervious soils, unless very carefully drained, produced by evaporation of water from the surface, a cold, humid, damp atmosphere, very injurious to health. While the public roads, forecourts, and areas in front of houses in towns were well drained, the back-gardens were generally neglected, and the basements suffered in consequence. But a worse evil was the erection of houses on "made ground"; and such sites, on which abominable deposits of rubbish had been made, should be avoided altogether. Having secured a fairly healthful site, the next consideration was how to make the best use of it. If the ground were treacherous, as was usually the case, a few cube yards of good concrete should not be grudged; and if the soil contained water, Portland cement should be used instead of lime as matrix. The concrete should usually be 2ft. thick, and never less than 12in. thick; the trenches should be 12in. wider than the lowest footing of wall, and a layer of the same material should be spread over the entire site, and under all paving external to the wall of house. All soil drains should also be bedded in concrete to a fall of not less than 8in. in 10ft. Just above the lowest floor-level, a damp-course should be laid in the walls. This could either be by a double course of slates in cement, or a layer of asphalte ¾in. thick, or by some of the many stoneware courses exhibited in the museum. Those with lateral perforations were of great use as air-bricks in furnishing a supply of air beneath joisted floors, and so preventing the occurrence of dry rot. Where the inclosing walls of dwellings were of solid brickwork, they should never be less than 14in., although the Metropolitan Building Act allowed them to be 9in. work for certain heights and length. But a much drier and stronger wall resulted from building hollow, with galvanised-iron ties at every square yard. The walls need not be so thick if built of cement concrete; on the table before him were Lascelles' patent fish-scale tile, and other slabs, which, although only 1½in. thick, were quite impervious to moisture. The porousness of soft building-stones might be overcome by various chemical solutions; the Indestructible Paint Co. had provided one, two coats of which, applied by a brush when the stone was dry, would stop the pores. He never used Bath stone externally without specifying the use of this solution. In the use of bricks it was highly important that they should be well burnt; white gaults, wire-cut or pressed, made good face-bricks, and the pinks were best to back them with, because they were of equal size. If a thick brick were backed by a thin one, the settlement of the wall would be uneven, as the mortar-joints would differ in thickness. Condy's granite-bricks, from Chudleigh, Devon, were like flint, and could be put in trucks for 37s. 6d. The axiom of placing voids over voids was too often neglected in the building of bay windows, and the bressummer was frequently overweighted when no architect was employed. The brickwork over every opening should be sustained by discharging arches. What most disfigured buildings was the bad construction of the arches over openings, more particularly when covered by cement architraves and cornices. He cautioned his hearers against the use of inferior mortar, and especially against that in which sludge from sewers was incorporated. Chimney-flues should be built solid, and should lie as straight as possible, and down-draught might be obviated by sloping a portion of the length, with a seat at either end for the air to beat against it. These, it was true, would harbour some soot, but would never be quite obliterated, and were always cleared by the sweep. Terra-cotta was a very effective lining to flues, but it did not afford sufficient hold for the soot, which often fell at inconvenient seasons. In the use of tiles for roofing, or for half-timbered work, it was well to remember that pale red tiles, like place bricks, were but half-burnt and porous; they ought to be of rich warm colour, with a bloom, and were then indestructible and excellent non-conductors. Great improvements had been made in ridging-tiles, and those of Cooper, of Maidenhead, and others, were exhibited and described by the lecturer. Cresting should not be a separate part of the ridge set in a groove, but ought to form part of the general tile, and the simplest outlines were best. No pavement was better than the best Staffordshire red black and buff tiles, and none were cheaper, they should be laid in concrete, bedded in mortar, and pointed in cement. Where a warmer paving was wished for, thick wood blocks 1½in. to 2in. through, and 6in. long by 3in. broad, Burnettised to prevent rot, might be used; they should be bedded in gauged hair-lime and mortar, and the interstices filled in with dry Portland cement powder; after sweeping clean, they should be washed down with water, when the cement would set. He showed a specimen of solid wood floor, set in asphalte, invented by Mr. William White, and sent by the manufacturer, Mr. Gregory, of Clapham Junction, and added that he believed it to be the best floor for basements. Mr. Robins observed that as the surveyor of the Berners Estate in Oxford-street, with some 600 houses under his care, his experience had taught him that the exclusion of moisture was the secret of perpetuity, as it was also the most important element in healthfulness. The chief causes of premature decay were damp soils, damp walls, and damp roofs. Good construction in building houses was not to be understood without taking pains to understand it, and thus the province of the architect was not to be despised. The architect stood between owner and builder, and arbitrated between them; he prepared the specification, he brought scientific as well as technical knowledge to bear upon the attainment of the largest result for the least money, compatible with sound construction and good sanitation; he took upon himself the responsibility of seeing that his instructions were carried out by the builder employed. There were lots of young educated architects, anxious to make their way in the world, to whom the smallest opportunity of distinguishing themselves was a pleasure, and such men were ready to give their services for the poor pittance of 5 per cent. on the cost of the building. Why should his hearers, therefore, deprive themselves of the assistance of such men to save a penny and spend a pound they knew not how? Returning to the subject of construction, the lecturer dwelt upon the advantages of terra-cotta for dressings, cornices, and ornamental details, and exhibited specimens of the material, remarking that it was comparatively indestructible, and if made from a repeating pattern was cheaper than any other substance. The construction of drains was detailed, stoneware being described and shown as the only safe material for house-drains, and the advantages of disconnection and ventilation were referred to. As to the interior of the house, good joinery was indispensable, and for this yellow deal or pitch-pine from Christiania was a good wood, as was Baltic timber from Memel or Riga for carpentry. The origin of timber could always be ascertained, as their trade-marks at the end of every plank and the corresponding letters were given in Spon's "Builders' Pocket Memoranda Book." In windows, nothing was better for keeping out weather, and for ventilation, than the old rising sashes. He urged his hearers not to covet heavy plaster cornices and central rose flowers, nor to seek after big architraves and large mouldings, and, above all, not to try to save by pinching the price given for ironmongery; a few shillings made all the difference between misery and comfort in the use of locks, fittings, and furniture generally. If they had sound flooring 1¼in. thick for ground-floor rooms, and had them tongued, stained, and varnished for 18in. or 2ft. all round, they would be able to carpet the house at half the cost, and have the pleasure of removing their coverings for cleansing as often as they pleased without trouble or injury either to floor or carpet. In conclusion, he urged them to exercise their common-sense in building or in choosing a house, and to read, before doing either, Mr. Teale's book, illustrating the evils of bad plumbing. At the close of the lecture, Mr. Rutherfurd proposed, and Henry Rutt seconded, a vote of thanks to Mr. Robins, the latter remarking that if they had not that afternoon been the guests of the executive council, he should have suggested that the lectures would be better appreciated and better attended if the place were rendered more comfortable by the provision of a few seats and a lecturer's table.

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AN IMPROVED METHOD OF REMOVING THE PRODUCTS OF GAS COMBUSTION.

MESSRS. ROBERT BOYLE AND SON, of Glasgow and London, have just introduced a method of removing the deleterious products of gas-combustion which has much to recommend it. It is very simple and inexpensive, and may be applied to any building, great or small.

The idea of using pipes to draw off the products of combustion and heat from gas is, of course, not a new one; but the error lay in single pipes being used, which, in practice, were found to act as heaters instead of coolers of the atmosphere, as they condensed and radiated the heat exactly on the same principle as hot-water or hot-air pipes used for heating buildings. This was more especially the case where they were applied to billiard-rooms, owing to the amount of piping used; and we know of a number of public buildings where they had to be removed for this reason, the remedy being found to be worse than the evil.

Messrs. Boyle overcome this difficulty by using double pipes, one within the other, with a non-conducting material packed in the space between the pipes. This arrangement not only effectually prevents radiation, but also reduces the condensation in the pipes to a minimum, as the inner pipe is infinitely hotter than the air passing up; as condensation only takes place when a body of a less degree of temperature is come in contact with. There is, however, provision made to receive and dispose of any condensation which may ensue. Diagram No. 1 shows a section of a hall pendant: A is the gas supply-pipe; B 1in. ventilating-pipe, for drawing off the heat and products of combustion; C non-conducting packing between inner and outer pipes; D 1½in. outer pipe; E gutter on bottom of cone, above globe, to receive any condensed vapour which may be formed in the pipes. There is no possibility of this gutter ever becoming full and causing an overflow, as the strong and continuous rush of air up the ventilating-pipe, created by the air-pump ventilator on the top, will cause it to evaporate and carry it off.

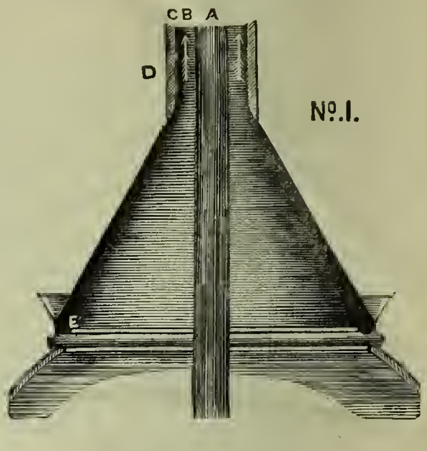

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Fig. 2.

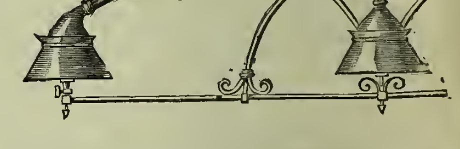

Fig. 2 represents the application of the arrangement over the lights of a billiard-table, and we have chosen this illustration because it is in billiard-rooms that such an invention is most required, and would be found most useful. The ventilating-pipe B is bent towards and into the mouth of the extracting-shaft, so that it acts like a hot blast, and materially assists the ventilation; there is double casing, with non-conducting packing, to prevent any chance of fire occurring through the ventilating-pipe getting overheated.

This plan applied to a building, in conjunction with an air-pump ventilator and proper air inlets, insures as pure and fresh a condition of the air as that outside. If double pipes only were used, without the intermediate packing, the result would be little better than if only one pipe was used, as the current of cool air passing up between the pipes would conduce to condensation, and the warmth it absorbed would heat up and be radiated from the outer pipe.

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THE ROMAN BUILDINGS NEAR BRADING, ISLE OF WIGHT.

THE ordinary meeting of the Royal Institute of British Architects, held on Monday evening, under the presidency of Mr. John Whichcord, was devoted to the reading of papers by Messrs. Price, and a discussion on the recent discovery of Romain remains at Brading. Mr. F. G. Hilton Price, F.G.S., read a report by the Executive Committee, and exhibited a large plan of the buildings found, and several large cases filled with the results of the explorations, including fragments of urns, pottery, Samian ware, small bronze and iron tools, bones, and a great quantity of fragments of straw-coloured and grey glass. The remains, it was shown, extended over several fields, now divided in occupation between Lady Oglander and Mrs. Munns, a small portion only being in the latter lady's land. Captain Thorp, of Yarbridge, ascertained that while placing some hurdles on Mrs. Munns' land traces of walling had been found in the soil, and, following this clue up, the well-defined outlines of five chambers were cleared. The veteran antiquarian, Mr. C. Roach Smith, himself a native of the island, and Mr. F. Roach, of Arreton, and others, interested themselves in the matter, and a small committee was formed to investigate the remains. This committee had been reconstituted on a wider basis, and the explorations carried on systematically by Mr. J. E. Price, and the author. Only a portion of the site had as yet been opened up, on the north and west outer sides of a square 200ft. across, but nineteen chambers or apartments had been uncovered. In the present stage of the investigations it would be unwise to attempt to assign names to these, and he should, therefore, distinguish them by numbers: Chamber No. 1 measured 18ft. by 10ft. 6in., and had outer walls 27in. in thickness, and division walls or partitions of 18in. thickness. It contained, *in situ*, five flues placed at unequal distances apart, from 3ft. to 5ft. 3in., and these were 16in. high and 4in. broad. In the chamber were found fragments of pottery, iron spikes and nails, portions of stags' horns, and other bones. No. 2 was a square chamber 20ft. in diameter; it was paved with tesseræ, and contained fibulæ, pottery, and other remains. Chamber No. 3 was 15ft. 6in. by 17ft. 6in., and was ornamented in the centre with a fresco 10ft. 6in. by 9ft. 6in. At the west end of room was a mosaic pavement representing two gladiators in combat; there was on the north side a fresco of a fox under a vine, on the south another of a man with a cock's head and legs. No. 4 was a room 11ft. 8in. by 10ft. 6in., which had, to all appearance, never been paved except with plaster or concrete, a large mass of which was found on the floor; small pillars of greensand still existed, and the room yielded a number of small objects similar to those already mentioned. In No. 5, which measured 7ft. 6in. by 20ft., a small jug, an iron hook, and some fragments of glass were discovered. No. 6 was a very large apartment, 43ft. 8in. total length, partly divided by low walls, and of varying breadth. In the centre of one portion was a very fine mosaic, with a representation of Orpheus playing to the animals and birds on his lyre; on his left was a monkey wearing a cap—a very unusual adjunct. This design was inclosed by the guilloche pattern, and beneath it, and also under Nos. 9 and 12, was a subway about 3ft. high, and covered in with slabs of limestone; this, apparently, was a heating passage. A great quantity of worked stones and pottery, and a Roman coin, A.D. 333, were found in this chamber, also vessels of red or Samian ware, and others of cement; in which, most probably a mortarium, were found coins of A.D. 265-7 and 267-72, and pieces of plaster with traces of fresco upon them. No. 7, unfortunately situate on the boundary line of properties, was about 20ft. square, and was paved with red and white tesseræ, much injured by fire. No. 8, so far as it could be traced, appeared to be about 20ft. by 21ft.; it contained a circular structure 4ft. 6in. in diameter, which seemed to have either been a furnace or oven. No. 9 was 19ft. 9in. square, and was paved with red and white tesseræ. No 10 was 11ft. by 10ft. 5in., and had a raised seat or ledge on two sides; it was floored with flat red tiles, and not with tesseræ. The next, No. 11, was 15ft. by 5ft., and simply paved with rough cement. No. 12 was the largest and most interesting chamber yet opened up. It was 39ft. 6in. in length, and diminished in breadth from 19ft. to 15ft. 6in. in the middle, and 11ft. at the narrow end. It was laid with mosaic pavement, with an outer guilloche border inclosing a series of medallions. Of these the largest represented the head of Medusa, and there were shepherds and other pastoral scenes in the other subjects. The border was very remarkable; it exhibited a white fret pattern on a red ground, ending in the *swastika* or Vedic cross at one end of room In a pipe, flue, or drain in one of the walls, was found a piece of cannel coal which, taken with other discoveries of coal at Uriconium and other places, went far to prove that the Romans used it as fuel. No. 13 was 7ft. 9in. by 3ft. 10in., and was floored with red tiles and walled with plaster; it appeared to have been used as a bath. No. 14 was 15ft. 4in. by 10ft. 2in., and had a floor of cement; the walls were faced with plaster which had been tinted a dull blue and splashed with red and black in imitation of marble. No. 15 was a hypocaust 15ft. 2in. by 10ft. 7in. It contained fifty-four pillars, each 30in. in height, and built up of thirteen tiles each. These were still *in situ* on the rough cobble-stone floor, and there were also two flue tiles in position. On the west side was a low arch in stone, which, probably, led to the furnace, an adjunct which has not yet been fully excavated. No. 16 measured 17ft. 3in. by 10ft. 7in., and the walls were covered with red stains. Within it, in addition to articles previously described, were found a number of red slabs of tile, two Samian bowls from Durobrivium, a strong tripod stand 5½in. in height, &c. In the passage leading from this was a bed of burnt earth, which, when sifted, yielded 16 bronze studs, two handles of bronze, four iron hinges with a few of the flat nails still in their holes, an iron hook, and a number of pieces of pottery ware. No. 17 was 19ft. 5in. by 10ft. 3in.; the floor was of concrete and the walls of stucco; it communicated by a stone step with No. 18. This room (No. 17) contained several large nails or spikes, but the chief discovery was that of a great quantity of fragments of glass, varying in colour from a bluish-green to drab and pale yellow. These were polished on one side, and the largest piece was about 7in. by 4in. Many fragments of cups and bottles of glass were also found, but so crushed as to render it impossible to reconstruct any; there were also huge trays of shale, broken lamps and jugs, and a piece of wrought iron 4½in. by 2¾. No. 18 was 21ft. 6in. by 18ft. 6in, and had plastered walls of a dull blue tint splashed to resemble marble. No. 19, the large chamber at present excavated, was 9ft. by 10ft. but had not yet been properly examined. The walls had been traced for at least 100ft. beyond the limit of the present explorations. He trusted the work would be continued, and that in a second report the executive committee would be able not only to describe further rooms, but to assign uses, if not names, to the entire group.

The President said before the discussion was opened, he would introduce to them Dromio No. 2, in a second Mr. Price, who, although also a London antiquarian of the same name, and associated from the first in the work at Brading, was in no way related to Mr. Hilton Price.

Mr. John E. Price, F.S.A., then made a supplementary statement, in which he remarked that it was singular that traces of the Roman occupation of the Isle of Wight were not known to exist till within the last quarter of a century. The classical authorities were very clear in mentioning the occupation. It was a well-known historical fact that Vespasian, when in Germany with the 2nd legion, was summoned by Claudius to assist in the occupation of England, and that after some victories over the people of Dorsetshire the Isle of Wight was occupied. Even so recently as 1816, Sir Henry Inglefield stated that there were no traces to be found of the Roman occupation except that at Carisbrooke some coins were picked up which had probably been dropped there; but in 1859 some Roman discoveries were made at Carisbrooke, including a footbath. In 1862, during the making of the Cowes and Newport railway, calcined bones and pottery were found, and these were followed by similar discoveries at Ryde and at Arreton. In 1864 Roman buildings, tiles, and masonry were discovered in Gurnard Bay, which had since, unfortunately, been destroyed by an encroachment of the sea. More discoveries were made at Bromhead, Shanklin, and more recently on the Poet Laureate's property at Freshwater. Then Captain Thorp had traced some Roman ways near Brading, and found that one of these crossed, by a ford now disused, the tidal Brading haven leading to what was still known as Centurion's Copse at Bembridge. An old lane, known as the "Fosse-way," passed close to the site of the present excavations. They believed that the dwellings were of one story in height, and were covered with large tiles laid on joists, as traces of these, and many of the roofing tiles, had been found. The tiles resembled those found at Woodchester, and the larger buildings in the north of England. The whole site had been greatly altered since the Roman time by the encroachments and recessions of the sea.

Major A. F. Leeds, Chairman of the Committee, stated that arrangements were being made with the two proprietors for throwing open to the public all the remains, which would be covered in by one series of sheds. He had traced the causeway very distinctly from the remains to the ford over the haven, but there had, at present, been nothing found at "Centurion's Copse" on the Bembridge side. He paid a high tribute to the careful and thorough way in which the Messrs. Price had carried out the investigations.

Mr. E. W. Brabrook, F.S.A., hon. secretary to the committee, asked for technical information as to the buildings from architects, and urged the importance of pursuing the present investigations to the end. They had not even opened up a great part of the area which seemed to be covered with buildings, and he was confident there was much yet to be investigated and learned at Brading. Dr. Lewis asked at what depth below the surface the walls were discovered. The majority of Roman remains in England had been barred at the depth of 16ft. to 18ft. and even 20ft. Mr. F. C. Penrose thought the most interesting yields of the exploration were the marvellous specimens of glass exhibited that evening. It had been tacitly assumed that the introduction of glass in our windows was a luxury invented during the Gothic period, and then only used in churches; but here was evidence of the use of glass of respectable dimensions, and in two or three colours in dwellings. Had domestic glass of the Roman period been found in any other place in England? Mr. G. H. Birch referred to very similar explorations he had made at Lyme Regis, where the walls of a villa were still perfect to a height of 2ft. 6in., and Mr. E. C. Robins suggested that explorations in Newtown, I.W., which seemed to be built on the site of an older town, would probably be repaid by discoveries. Mr. J. G. Waller referred to the use of the *swastika* as a border to mosaic pavement in one of the principal rooms at Brading, and claimed to have given the symbol this name 40 years ago. The *swastika* was the oldest emblem known; it was found by Dr. Schliemann at Hissarlik, in many Eastern countries; in England it was a common ornament on priest's dresses till the reign of Edward III., when its use was discontinued, only reappearing once in the 15th century. The old English name for it, the late Mr. Albert Way and himself ascertained, was "philpot." Mr. Alma-Tadema, R.A., congratulated Messrs. Price on the character of the finds, comparing the bronze work with some in an Italian museum, and wished the committee good luck in their further explorations. Lieut.-Col. Lenox Prendergast inquired if any theory had been formed as to the cause of the destruction of these buildings. Mr. Forster Hayward remarked that Roman buildings were not invariably buried far beneath the present soil. At Colchester, sculptured stones and coins were but just beneath the surface. The President suggested that that was because Colchester was built on a rocky site, but Mr. Hayward said that there was no stone within miles of Colchester, where the soil was gravel.

Mr. Hilton Price, in replying upon the discussion, said the pavements were found at Brading from 3ft. to 4ft. below the surface, and the walls only about 18in. deep. The discovery of glass was not a novel feature of the explorations, for it had also been found at Uriconium, with plaster adhering to the edges, also in London, and at several other Roman sites. In the glass at Brading, which had been analysed, there was a total absence of lead, supposed, from the condition of the buildings, that they were forcibly destroyed—probably pillaged—and afterwards set on fire, as the walls, floors, and all the contents exhibited traces of burning. The best floors were originally laid with mosaics, and the others simply with plaster, now greatly decayed, but which had once been coloured on the surface.

The President proposed a vote of thanks to Messrs. Price, and said he should not attempt to sum up the discussion, because, coming from the chair, there would be something like responsibility attaching to his opinions. In his opinion, the explorers had done wisely not to attribute names to the several buildings in the present incomplete state of the investigations; but he hoped they would be carried forward to a successful issue, and that fresh facts would be brought before the Institute on some future day. Mr. J. E. Price, acknowledging the vote of thanks, remarked that the executive committee had steadily declined to give any theory as to the use and intentions of the buildings, fearing that further inquiry would perhaps show that they had been too hasty in their conclusions. They had simply noted everything as it actually existed. Traces of a base and shaft had been found, and they had still hopes that in the part yet to be opened out, remains of a more architectural character would be found.

The meeting was then adjourned till January 3rd.

ST. MARK'S, VENICE.

MR. W. J. STILLMAN writes from Florence to assure English readers through the *Times* that the portions of St. Mark's, Venice, "rebuilt or restored by Cavaliere Meduna have been treated with a reverence as profound as that of a surgeon operating on a beloved child, and that, with the exception of two slight restorations to their original lines, nothing has ben altered and nothing done which was not indispensable to the preventing the building from falling into shapeless ruin. I have seen all the plans for the future work, and believe that in regard to what has been done or is proposed to be done nothing different from the plans of Cavaliere Meduna will be done by the Italian Government or can be done except to allow the building to follow more freely its manifest destiny—*i.e.*, to sink into the mud of the lagoons for want of a properly laid foundation, or fall apart through the wretched quality of the brickwork which constitutes the body of the building. Mr. Ruskin is doing all that can be done to preserve the beauty of St. Mark's for remote generations —*i.e.*, to make exact studies of it and its parts with each of the details; for at no remote period (reckoning archæologically) the building must fall into ruin: the tide ebbs and flows under its floor so that a boat might come up under the great dome if a canal were cut from the lagoon; and the undulating floor which some people regard as a beautiful feature of the design is only the evidence and consequence of the upward thrust of the piers of the old church underneath, which prevents certain points of the pavement sinking as fast as the rest." Mr. Stillman adds that he has no acquaintance with Cavaliere Meduna except what grew out of the visit to the church under his guidance, and though he (Mr. Stillman) went prepared to lampoon him for his supposed barbarism, he left convinced that he understands his duty and does it.

Mr. G. E. Street, in a reply to Mr. Stillman, says that that gentleman's assurance that, "with the exception of two slight restorations to their original lines, nothing has been altered," is entirely opposed to the evidence of the eyes of all those who have inspected the work for themselves and who know how to observe. Mr. Street continues: "But I suppose I am right in assuming that the two slight alterations to which Mr. Stillman refers are—(1) the alteration of the levels of almost all the architectural features from the ground to the top of the balustrade at the southern end of the west front; and (2) the bringing forward of the south-west angle and reconstructing it on ground never before occupied by the building. The effect of these two 'slight alterations' is to necessitate the entire rebuilding of the west front from one angle to the other, if the works thus commenced are ever again carried on upon the same lines. But on behalf of the St. Mark's Committee, I venture to say we are satisfied that the Italian Government will prevent any further execution of such destructive works. We have their distinct assurance that they will do so, and we prefer believing in their promises to believing that Mr. Stillman is correct in stating that 'nothing different from the plans of Cavaliere Meduna will be done by the Italian Government.' At the same time it would be difficult to adduce any more complete justification for the formation of a committee to watch proceedings than such a letter as Mr. Stillman's, written apparently after a conference with the gentleman who has hitherto had the charge of the works at St. Mark's."

LEEDS ARCHITECTURAL ASSOCIATION.

THE annual conversazione of the Leeds Architectural Association took place last week. The President (Mr. Henry Walker, F.R.I.B.A.), delivered a brief address, and distributed the prizes to the successful students. The present occasion was one so opportune that he could not refrain from embracing it in order to refer to the present position of their profession in Leeds. It was deplorable to find that the services of their local architects were not better appreciated at home. Could it be wondered at, when he told them that there was rarely a work of any importance to be put up in Leeds, but that an architect from a distance was called in to do the work and carry off the pay. Now, as regarded public works, he contended that so long as there was anyone practising in the town, competent and of good repute, it was only fair that the work should be kept at home, unless it could be shown that a better design could be had or something saved by going elsewhere. They were even slighted by tradesmen and others having no pretence in matters of taste or architecture, simply because it was the fashion to do so, and being in office, they used their power accordingly. Much of this arose from the fact that architects were, as a rule, a good-natured set of people, and too thoroughly engrossed in their work to inquire into the cause of the present state of things, and consequently there was no one to "bell the cat." The formation of their society, he was glad to say had helped materially in placing them in a better position than they were five years ago, and he presence of so many gentlemen of position and influence in the town amongst them that evening was a proof of that. Notwithstanding the severe criticism of the architecture of the present day, the works of many of our leading architects would bear favourable comparisons with the works of earlier ages, besides having an individuality characteristic of the present century; and it was satisfactory to know that Leeds architects, when placed in open competition, could hold their own against the rest of their professional brethren in the country. A list of the prizes was read by the secretary (Mr. W. H. Thorp), as follows:—

The association silver medal, awarded to Mr. Arthur Gaunt for the best series of measured drawings of the gateway of the Archbishop's Palace, Cawood; the monument of Archbishop Grey in the south transept of York Minster, and drawings of other examples of ancient architecture.

An extra book-prize, "Gwilt's Encyclopædia," given by Mr. W. H. Thorp, awarded to Mr. Frank Raney, of York, for the second best series of measured drawings of examples of ancient architecture, including the monument of Archbishop Grey in the south transept of York Minster, and drawings of several interesting old Norman doorways of churches in York and the neighbourhood.

A prize of the first two vols. of Fergusson's "History of Architecture," given by Mr. George Corson, awarded to Mr. Alfred Whitehead, for the best design for a town church of round-arched style.

A prize of Fergusson's "Modern Styles of Architecture," given by Mr. George Corson, awarded to Mr. Joseph Hall for the second best design for a town church of round-arched style.

A prize of Fergusson's "Modern Styles of Architecture," and Viollet le Duc's "Habitations of Man in All Ages," given by Mr. John Tweedale, awarded to Mr. Alfred Whitehead, for the best series of drawings made at the fortnightly class meetings.

A prize of Nesfield's "Specimens of Mediæval Architecture," given by Mr. Henry Walker, awarded to Mr. Bowman for the second best series of drawings made at the fortnightly class meetings

During the course of the evening Mr. Binn's string band performed a selection of music, and glees and songs were contributed by several members and friends. Refreshments were provided in the reception-room.

LIVERPOOL ENGINEERING SOCIETY.

THE usual meeting of this society, being the last meeting of the session, was held on the 8th, the president, Mr. A. Ross, M. Inst. C.E., in the chair. The report of the council for the past session was read, which showed very satisfactory progress, twenty-three members having joined during the year. The officers for the ensuing year were then balloted for, Mr. Alfred Holt, M. Inst. C.E., being unanimously elected as president.

The retiring president then read his address, taking for the subject his "Origin and Progress of Railways," being led to his choice in consequence of this year being the fiftieth anniversary of the opening of the Liverpool and Manchester Railway. The author commenced by giving a sketch of the knowledge attained in engineering, previous to the introduction of railways; and referred to the military roads made by the Romans as being the first engineering works in the country; the next in order being the supplying of towns with water, followed by the reclamation of land, much of which was done by the Dutch engineer, Cornelius Vermuyden, who, for his services, was knighted by Charles I. in 1629. After the rebellion of 1745 the necessity of military roads again called for the engineer, and about the same time the Duke of Bridgewater inaugurated canals. From this time works of great magnitude were carried on by such men as Brindley, Smeaton, Rennie, and Telford. Glancing at the rise and progress of the steam-engine, reference was made to the application of steam in the historical account of contrivances by Hero, of Alexandria, 2,000 years ago; and a description was given of the various proposals and engines actually made by the Marquis of Worcester, Papin, Savery, Newcomen, Watt and Wolfe, and similarly the history of steam as applied to land transit was traced in the efforts of Cagnot, Trevethick, Symington, Murdock, Jessop, Blenkinsop, Booth, W. H. James, Timothy Hackworth, and George Stephenson. An account was next given of the Stockton and Darlington and the Liverpool and Manchester Railways, instancing the trial of locomotives at Ramhill, when the Rocket was declared winner; and the public ceremony of the opening of the line on the 15th September, 1830, and the melancholy and fatal accident to Mr. Huskisson, M.P. for Liverpool. Several of the most important railway bills were noticed and figures given to show the enormous extent of the railway system in this and other countries. The author, referring to railway accidents, said that all modes of travelling are attended with more or less danger, but personal locomotion has increased so much that no other mode has been tested so severely as railways; still during 1879 (exclusive of the supposed 73 persons who were drowned in the Tay Bridge disaster) there were only two passengers killed on the railways of the United Kingdom from causes beyond their own control; and from a table by Sir John Hawkshaw, given with his address to the British Association at Bristol in 1875, we get an average from 1846 to 1873 inclusive as passengers killed from causes beyond their own control, to miles travelled in round numbers, as 1 in 147,000,000, and as passengers killed or injured as 1 in 5,000,000. That is to say, a man might for 70 years travel by railway over 70,000 miles each year, before he would, at the rate at which accidents happen, be injured, and if he were constantly travelling at the rate of 50 miles an hour, it would take him 335 years before his chance of being killed by an accident would arrive. The author argued that railway companies had the public safety at heart, and that safety appliances were adopted as the exigencies of traffic demand and experience pointed out were applicable; placing foremost amongst these the application of the electric telegraph, followed by a recognised system of signalling; the concentration and the interlocking of points and signals, the locking-bar and continuous brakes. Mr. Ross concluded by recommending the Liverpool Engineering Society to its members. The president-elect then took the chair, amidst great applause.

PAINT CRACKING.

PAINT too often is supposed to be dry, when really it is not half dry. It formerly took six months or more to get a job ready for finishing on the elastic principle, and then you would want good drying weather; but now you must paint a job through and through in a month, or even a shorter time, and the job is supposed to last the same. The quick process or flat coating can also be hurried so that it will crack, and crack badly too. Our ideas of obviating the cracking of paint are these: let every part of the wood be thoroughly primed with good fresh priming; prime inside and out, or use slush on the inside, which is just as good as priming, so that the water cannot act on the wood. Let the priming get perfectly dry, then mix every coat of lead so that it will dry hard. Mix the filling with japan and varnish, so that this may dry firm and hard; use no oil in it. Have every coat dead colour; do not have them with a gloss colour, which is very deceiving, appearing dry, but when the subsequent coats are put on, it goes into what is known as color cracks, caused by the under-coats not being hard. Do not apply the coats too heavy; have them be as thin as possible to answer your purpose, and let each get thoroughly dry before putting on another. Place enough coats on to fill the grain of the wood, making a perfect surface. Then you will have on a body of paint firmly bound together, and thoroughly dry. When paint is thoroughly dry, it can shrink no more, as it only shrinks when in the process of drying, and if it does not shrink it cannot crack; also in this kind of a body of paint, there is no moisture or oil to sweat out and destroy the lustre of the varnish.

Painting of this description will not crack until the joints of the wood begin to give way, admitting water and damp atmosphere, which swells the wood along the edges of the joints, causing the paint to crack from the swelling and shrinking of the wood. Varnish may crack on top of the best painting ever done, and the underneath or foundation be solid. We have seen where the varnish on jobs was cracked terribly, but in taking the varnish off by the use of spirits of ammonia, found the filling as sound as it was possible to be. If the paint is not well protected by varnish, it will perish in time, sooner or later, according to how well it is protected. A job to be kept in good order should not be allowed to go for two or three years without having anything done to it; we have seen men who would complain because the painting did not last as long as the carriage, thinking, we supposed, that the one painting was enough. Once a year is enough to have a carriage varnished to be kept in order, though no rule is laid down, except when it commences to look as if it wanted varnishing, have it done; don't wait until it wants burning off before attending to it. Nowadays, painters will paint jobs in two weeks, and wonder at the cracks. The blame is generally laid on the material, or on anything else handy and suitable, but the real cause is, finishing the job in two weeks, requiring the coats to dry as hard as possible, and trusting to luck for results.—*American Carriage Monthly.*

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DESIGNS FOR HEADSTONES AND CROSSES.*

THIS is the title of a book of original designs for a variety of memorials, by Mr. William Borrowdale, sculptor, of Sunderland. No doubt the author will find a ready sale for the work among a large class of cemetery-masons and sculptors, who have to keep a stock of designs and ready-prepared monuments to meet so many tastes; and for this purpose Mr. Borrowdale's designs will be appreciated. We cannot avoid saying, however, the designs fall rather below the standard of cultivated taste in these matters. Where the designs are not devoid of merit they are heavy; we may take for examples Plates 2, 5, 6a, 13, and 30. Plate 6 shows a sensible treatment of headstone, superior in every way to that on Plate 3, where the carved flowers and upturned finger are painfully naturalistic. The same weakness strikes us in the crosses on Plates 4 and 10a, also 19, 27, 34a, 40, 42, and 43. Some character and meaning are to be found in Plate 7, in its main outlines at least. The Gothic cross (Plate 9) is rather too clever and German in style to please us. There is far more repose in the headstones (6 and 10) than in any others we see in the book. Plate 11 is a Gothic headstone; but it suffers from heaviness of detail, and the short pillars are meaningless. Simple and effective is design 13a; but those on plates 16, 17, 18, and 19 are hackneyed, and conceived in styles which have grown positively distasteful. The book would certainly not lose in value if such sketches as those of Plates, 26, 27, 28, 29, 33, 34, 41, and 42 were omitted.

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New premises have just been completed for a firm of carriage-builders in Newington-butts, opposite the Metropolitan Tabernacle. The building is of three lofty stories in height, and is faced with white bricks, stone-dressings being freely employed; the style is Renaissance. Mr. Banister Fletcher, of Bridge-street, Blackfriars, was the architect; and Mr. Barman, of De Laune-street, Kennington, was the builder.

BOOKS RECEIVED.

Practical Hints on Levelling, for the Use of Architects and Others, by W. Scott McDonald (Edinburgh: W. Reid and Co. London: B. T. Batsford), is a simple and accurate exposition of its subject, just suitable for architects' assistants, and others, to whom a knowledge of levelling is useful, but who have not close at hand a ready manual. The price is only 6d. ——*Notes on Books*, published by Longmans and Co. (London: Longmans and Co.), is a very handy publication. It enables bookbuyers to keep themselves informed of the names and nature of new books issued, and, with that end in view, is sent regularly to anyone who will transmit his address to Messrs. Longmans and Co.——*Calvert's Mechanics' Almanack and Workshop Companion* for 1881 (Manchester: J. Calvert), is published for the eighth time, and seems as useful and comprehensive as ever.——*Harper's Magazine for Europe* (London: Sampson Low, Marston, and Rivington), if equal in succeeding issues to its first, will run our English magazines hard. One hundred and sixty octavo pages, with more than seventy wood-engravings, for the most part superior to anything of the kind to be found in magazines generally, and all for a shilling, certainly furnish a strong claim on the support of English readers.——The *British Almanac and Companion* (London: Stationers' Co.) has reached its fifty-fourth year, and presents a varied selection of articles in addition to the annual reviews of science, architecture, picture exhibitions, music, and metropolitan philanthropy. The contents include: "Weather Forecasting," by Robert H. Scott; "Sketch of the History of the Royal Observatory, Greenwich," by W. T. Lynn, B.A., F.R.A.S.; "Egypt in Liquidation," by John Crowdy; "Proposed Ship Canal at Panama" and "Schemes for a Euphrates Railway," by George Dodd; "Watchmaking by Machinery in England," by Charles Stuart Murray; "The Food of the Poor," by W. E. A. Axon, M.R.S.L., F.S.S.; "Parks, Gardens, and Open Spaces," by F. G. Heath; "London Hospitals and their Management," by the Editor (Mr. Charles Mackeson); "Bee Farming," by James F. Robinson.——*The Architect's Legal Handbook*, by Edward Jenkins and John Raymond (London: C. Kegan Paul and Co.), has reached a third edition, and with additional matter is additionally useful.——*The Artisan's Year Book*, 1881 (Manchester: Abel Heywood and Son), is as useful and compendious an annual as we have seen. Copious extracts from the principal scientific journals, and much good original information are combined in due proportion.——Number 3 of *Decoration* (London; Sampson Low, Marston, and Rivington) is scarcely so good a number as its predecessors in itself; but any shortcoming, so far as quantity is concerned, is made up in the large decorative picture by Mr. J. Moyr Smith, representing "Odin and his Warriors driving through the Sky," photolithographed by Mr. Akerman.——*Bed-Room Ventilation*, by Lawson Tait, F.R.C.S. (Birmingham: *Herald* office) is a reprint from the *Transactions* of the Birmingham Philosophical Society, which may be read with profit and interest—especially just now in relation to the fog and smoke question.——*The Wooing of the Water Witch*, by J. Moyr Smith (London: Chatto and Windus) is "a Northern oddity" with numerous illustrations, some fanciful, some humorous, some sarcastic, but all well executed. We do not profess to understand the story.——Part I. of *Designs and Details of Dwellings of Moderate Cost in the Queen Anne, Eastlake and Elizabethan, and other Modernised Styles*, has reached us from New York, where the work is being published by Messrs. Bicknell and Comstock, the architectural publishers. The designs profess to be "adapted to the requirements of sea-side and summer resorts," and are said to comprise drawings by prominent architects of New York, Boston, &c. Taking the subject illustrated in the number before us, we have a scarcely more than ordinary house in timber construction by Messrs. Lamb and Wheeler, architects, and this building is copiously illustrated by plans, elevations, details, and constructional sections, as well as by a perspective view. The plan is certainly, even from an American point of view, open to several objections. The kitchen, for instance, opens directly out of the dining-room, while the pantry can only be reached from the former by passing through the latter. No furniture could well stand in the dining-room, as the wall space is so cut up by openings. The construction is the most interesting part of the matter, because the peculiar American manner of timber-building with studdings and boarded panels is clearly shown; but the mouldings and other details scarcely are characteristic either of Mr. Eastlake, Queen Anne, or Queen Elizabeth. The number closes with a sheet of verandahs.——*Life*, by James Platt (London: Simpkin, Marshall and Co.) is an excellent and readable treatise by the author of "Business," "Morality," and "Money." Mr. Platt has much to say that is worth attention on such subjects as the life of the present and the future, culture, health, and recreation, thrift, marriage, happiness, and the like, and the conclusion he, as a man of business and extensive knowledge of the world, comes to is worth taking to heart by those who, having exhausted life of all that is noble and worth living for, would bid us share their own well-deserved despair. "Life," says Mr. Platt, "should be to all of us a struggle after Truth and to do what is right, with the object of securing natural happiness here, instead of supernatural rights hereafter, taking as the compass to guide our lives by, no human rule or standard of man's devising, but

> The unwritten and the enduring laws of God,
> Which are not of to-day nor yesterday,
> But live from everlasting, and none breathes
> Who knows them—whence begotten."

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CHIPS.

Mr. G. E. Street has been appointed by the Council of the Royal Academy to deliver the lectures on architecture to the students, in the stead of Mr. E. M. Barry, deceased. The lectures will be given, according to present arrangements, on February 14, 17, 21, 24, 28, and March 5, 1881.

The plans of the new Manchester Post-office have been approved by the Postmaster-General; tenders will be invited in the course of a few weeks, and the actual work of building will commence in the coming spring. The site of the new Post-office will be a parallelogram, bounded by Spring-gardens, Marriott's-court, Brown-street, and a new thoroughfare to be made from Brown-street to Spring Gardens behind the Commercial Hotel. The building will be a substantial structure, Italian in style of architecture, and in general appearance not unlike the new Central Telegraph Office opposite the Post-office in St. Martin's-le-Grand.

A new rood-screen has recently been unveiled at the parish-church of St. Nicholas, at Rodmersham, designed by Mr. S. Slingsby Stallwood, of Reading, and made and placed *in situ* by Mr. Harry Hems, of Exeter.

The parish-church of St. John, Crosscanonby, near Maryport, was reopened on Thursday, the 9th inst., after restoration. The work in the chancel has been carried out from plans of Mr. Ewan Christian, of London, architect to the Ecclesiastical Commissioners; and that in the nave and its aisle, from the plans and under the supervision of Mr. Ferguson, of Carlisle. A new pulpit, reading-desk, altar-cloth, and heating-apparatus have been provided, and other alterations effected. The contractors were: Mr. W. Marshall, of Maryport, for masonry; Mr. W. Foster, Wigton, for joinery; Mr. Mandle, Maryport, for slating; and Mr. Nicholson, Wigton, for plastering. The total cost has been about £1,000.

The new barracks at Shrewsbury, built under the direction of officers of the Royal Engineers, were occupied for the first time on Monday.

New Congregational Sunday-schools were opened at Blandford, Dorset, last week. The principal room measures 35ft. 6in. by 26ft., with a height of 17ft.; and the infants' room is 18ft. by 14ft. All the fittings are of pitch-pine. Mr. C. Hunt, of Blandford, was the architect, and the cost has been £586.

A meeting of persons willing to take shares in a limited liability company, to provide suitable dwellings for the poor of Plymouth, was held in that town on Monday, the Mayor presiding. It was resolved that the company have a capital of £50,000, in £5 shares, and a committee was appointed to draft the memorandum of association.

A new Baptist chapel is about to be erected in Victoria-street, Deal. It will be built of brick, with stone dressings, and will seat 600 people. Mr. Cottew, of Deal, is the builder.

Plans prepared by Messrs. Hetherington and Oliver, of Carlisle, have been adopted by the burial-board of that city, for laying out the new cemetery at Upperby.

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* Original Designs of Headstones and Crosses. By W. Borrowdale, sculptor, Sunderland. London: Hamilton, Adams, and Co.

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ILLUSTRATIONS.

HOUSE AND STUDIO OF S. LUKE FILDES, ESQ.—NEW BANK AT ABERAVON.—B. D F. A. PRIZE MEDAL DESIGN FOR A HOMESTEAD FOR 50 COWS.—ST. MATTHEW'S CHURCH, NEWCASTLE-ON-TYNE.

OUR LITHOGRAPHIC ILLUSTRATIONS.

ARTISTS' HOMES: NO. 9.—MR. S. LUKE FILDES' HOUSE.

This house and studio stand at the top corner of the Melbury-road, Holland-park, Kensington, and were erected some three years ago by Mr. Lascelles, from the designs of Mr R. Norman Shaw, R.A. Our illustrations to-day simply give the general plans and elevations of the house, but next week we shall publish a perspective view of the building. The house is placed about midway on the plot on which it is erected, so that a front garden of moderate size is obtained. Entering an almost square and hospitably-furnished hall, the visitor reaches the level of the ground-floor proper, the various levels arranged throughout the house being so managed that the kitchens are hardly below the outside ground level, while a convenient distribution of rooms very easy of access is secured. Taking it as a whole, Mr. Fildes' house is more of a residence or dwelling-house than some that we have illustrated, and although the studio is, perhaps, larger than many, yet it does not overpower the rest of the house. The inner or staircase hall it some five steps above the outer hall, and is on a level with the serving and reception-rooms, of which the dining-room is entered first. Here a massively-wrought chimney-piece in walnut, made by Messrs. Jackson and Sons, is to be noticed. India rugs and carpets, in quiet reds, greys, and browns, suit the salmon or brick-red colouring of the walls, and carry out the brown painted window frames and doors. A serving-door is well planned next the back staircase. The drawing-room is a fine apartment, having a deeply-projecting bay window running almost the whole height of the room from the floor-line. A balcony outside provides a means of access to the garden at the rear of the house, which overlooks Holland-park, and Mr. William Burges' garden adjoining. A spare bedroom is placed next the drawing room, but an opening between these two rooms is contemplated, so that both may be thrown into one when desired. A moulded and foliated mantelpiece in white well suits the drawing-room. The main staircase affords a graceful approach to the studio. The long narrow windows give height and dignity, while the easy rise of the stairs themselves leaves nothing to be desired. The studio is 43ft. long by 24ft. wide, and has windows on all four sides with a series of toplights as well. The several lights to be obtained from these windows are completely under the control of the painter. These blinds, which are made of dense moleskin stuff, are hung on a double series of cords and pulleys, so that they may either be drawn up from the bottom or lowered from the top of the windows, and by this simple contrivance, a high, middle, or low light can at once be arranged. The skylights are shut by running shutters, and the whole contrivances in this respect are so complete that total darkness would be the result if all the blinds were closed. The large window at the east end is eventually to be built as a means of communication with a glass house, which will occupy the internal corner on plan at this end of the house. For a glass house intended to be used for outdoor effects, a sheltered position like this is most desirable, because if placed open to a south aspect in summer time, the heat and glare of the sun renders the glass house useless for painting purposes. An angle fireplace, from the special designs of the architect, is cosily arranged in the studio next the window opening on to the balcony in front of the house, but the heating of the studio is provided for by means of hot-water pipe coils worked from a compact vertical boiler placed in a heating chamber in the basement. The nurseries are on the first floor, and the servants' bedrooms are contrived on the top floor. The kitchen and offices are in the basement and a "look-out" is shown on the roof plan. The material used for the walls is red brick, and red tiles are employed for the roofs. An old wrought-iron seventeenth-century gate from Highgate has been erected at the entrance to the forecourt.

NEW PREMISES FOR THE GLAMORGANSHIRE BANKING CO., ABERAVON, S. WALES.

This building is now in course of erection in the main street of the town. The walling is of grey Pennant stone from a neighbouring quarry, with dressings of white Bridgend stone from the Luarella quarries. The roofs will be covered with Broseley tiles. The ground-floor contains the banking offices and manager's dining-room. Above is a commodious residence for the manager. In the basement are fireproof vaults, &c. The contractor is Mr. J. Thomas, of Neath, and the clerk of works Mr. J. Millward. The architect is Mr. J. Bacon Fowler, of Swansea and Brecon.

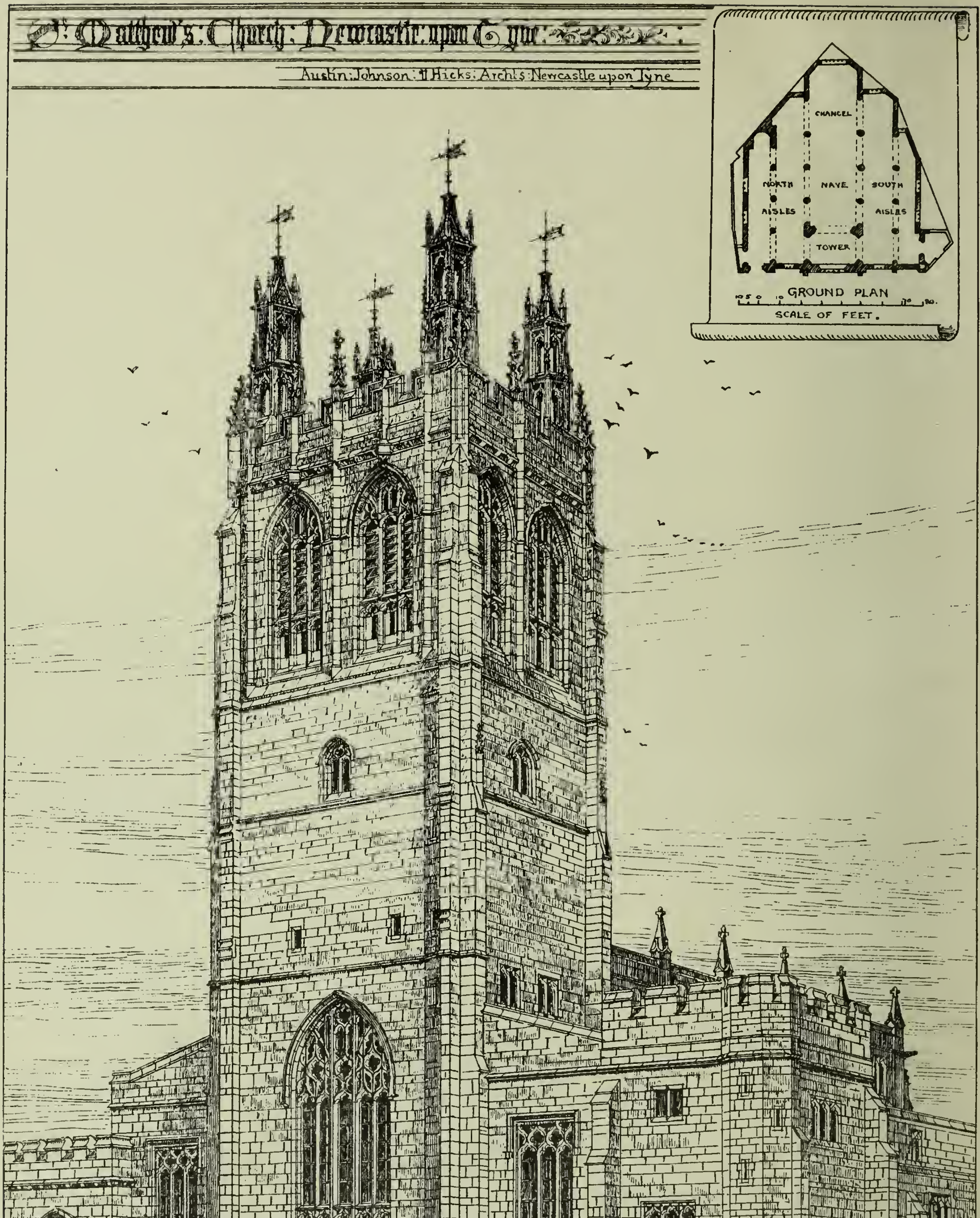
BRITISH DAIRY FARMERS' ASSOCIATION, 1880.—DESIGN FOR DAIRY-FARM FOR 50 COWS.

In this design it has been the endeavour of the author, Mr. Richard Waite, so to arrange the buildings as to economise time in preparing and delivering food, to construct each department with due regard to lighting, ventilation, means of egress, and internal communication, combined with economy. Tie-up stalls are provided for 48 cows in two double byres, the width allowed for each pair of cows being 7ft. between the divisions, and the length of standings from drain channel in the rear to the feeding-troughs is 5ft. 10in. A self-filling drinking-trough, raised 10in. above the feeding-trough, is shown between each pair of cows, to be supplied as circumstances permit, either by conducting water in pipes from adjoining land at a higher level, governed by service cistern; by storing the rainfall on the roof in a tank over root-store; or, the tank may be supplied by a force-pump worked by the engine. The author has successfully carried out all these systems in farm-buildings, but where possible prefers to get a supply from a considerable height so as to be serviceable in case of fire. A central feeding-passage 6ft. wide divides each cowhouse, with easy access from the mixing-room and food departments; the head-posts to stall divisions are cast iron, with flanges to receive batten rails, giving free access of air to the cows and providing ready means of feeding from the central passage, between the bottom rails; these rails being secured to the flanges of head-posts by screw-pins, that they may be raised or lowered at will. Light and ventilation are obtained by means of louvred skylights on the ridge of roofs, by iron casements in external walls, and by raising the roofs and overlapping at eaves, giving ventilation along the entire length. The cowhouses are divided and entirely isolated by a 9in. brick wall carried up to the roof (with a communicating doorway), the wall being intended to prevent infection, should it unfortunately appear. The doors are hung in two heights, as an additional means of ventilation. A complete system of drainage by glazed sanitary pipes is shown, conducting all liquid manure into a tank, built partly under open part of yard and partly under roadway, sunk sufficiently deep below the surface to give a good fall to the drains. The root-store and grain-cistern communicate with the mixing-room. The external doorways are 8ft. wide, hung folding, to admit carts. The grain-cistern is sunk 2ft. 6in. below the general floor line, and will contain, when full, about 3,000 strikes. The engine-room is intended for a 3 or 4 h.-p. vertical engine and boiler, to drive 2in. shafting running the whole length of the loft above. There is also a brick-built steaming-closet, to be filled from the loft above, as the chaff leaves the machine. The loft on the first floor is obtained entirely in the roof without raising the walls, and, like the mixing-room, is lighted by skylights in the roof. There is a communicating door between the loft and the upper part of straw barn, also an inner door to straw barn on ground-floor, opening on the main gangway for convenience in bedding cattle. The distance from food-preparing departments to any part of the buildings being so small, the expense of tramways is avoided. The yards for accommodation of young and store stock are shown 42ft. long and 43ft. 9in. wide. Twenty-five feet from back to front of the whole width is roofed over, in two bays, supported in the centre by 3 cast iron columns, and the remaining 17ft. 3in. is left uncovered, but well protected from cold winds by the adjoining buildings. Should it be desired at any time to cover in the remaining part, the only expense would be in the roof-timbers and slating; but the author's purpose in leaving part uncovered is to meet an objection raised by some practical agriculturists, that the warmth of yards entirely covered makes it undesirable to turn out cattle to pasture, except in mild weather. Ventilation is obtained on each side of the ridge, and by raised and overlapping eaves, as before described. The yard space is divided into two parts by means of a railed partition formed of 7ft. by 2½in. deal battens, secured by screw-pins to flanges cast on the iron columns, a dwarf iron standard being provided for the uncovered part. These rails may be removed in a few minutes if it is desired to throw both the yards together. Three boxes are shown for young calves, and a hospital. There are feeding-doors, and also an entrance-door to each, from the cowhouse, for convenience in suckling calves. As it is supposed there would be but little arable land attached to a dairy-farm, the author has considered a four-stall stable with the addition of a loose box for mare and foal sufficient; but if a nag stable and coach-house are wanted, a suitable site is shown for them on the north side of the kitchen court, the stable to be placed on the west side to avoid any possibility of nuisance to the dairy. The gig-house, shown next the stable, would in that case be available for a corn store. The piggeries, with boiler-house and swill-cistern attached, are placed as near the dairy as is prudent, and are convenient for feeding. The dairy is so arranged as to be near the house, but detached therefrom, and also near the cow-stalls for conveyance of milk; the adjoining room may be used either as a cheese-room when required for that purpose, or as a dairy scullery; there is also a covered shed on the south side, for airing utensils. The design for the farm-buildings also embodies the principles adopted by the author in actual work, and he is enabled to give the following estimate, founded on the cost of similar buildings erected from his designs. The estimated cost was, for the homestead and piggeries, £1,300; the dwelling-house and dairy, £900.

ST. MATTHEW'S CHURCH, NEWCASTLE-UPON-TYNE.

This church, as will be seen from the plan, has been designed for a very peculiar and restricted site, which is surrounded by buildings on every side except the west. Advantage has been taken of the circumstance that the longest dimension of the site is from east to west, to take that as the axis of the church. This is arranged with a nave and chancel, each 25½ft. wide, and both measuring 48ft. to the ridge of the roof internally. On each side are two aisles, the inner ones being lighted by a second clerestory. The vestries are below. The whole accommodation will be for about 750 adults. The church is to be finished inside in ashlar stone throughout. At present, the east end and part of the chancel and side walls, with some of the nave pillars, are alone built. The western part is temporarily roofed in and inclosed, and the whole area thus provided is seated with chairs. The permanent arrangements have, however, been made as to levels and altar-steps. The structure thus temporarily finished was consecrated in May last, and funds are being raised for the further completion of the fabric. At the proper time, this work will be undertaken from the outside, and carried on without disturbing the congregation. The stone pulpit shown in the drawing, and a font of Purbeck marble, with other matters, have been special gifts to the church. Messrs. Austin, Johnson, and Hicks, of Newcastle, are the architects.

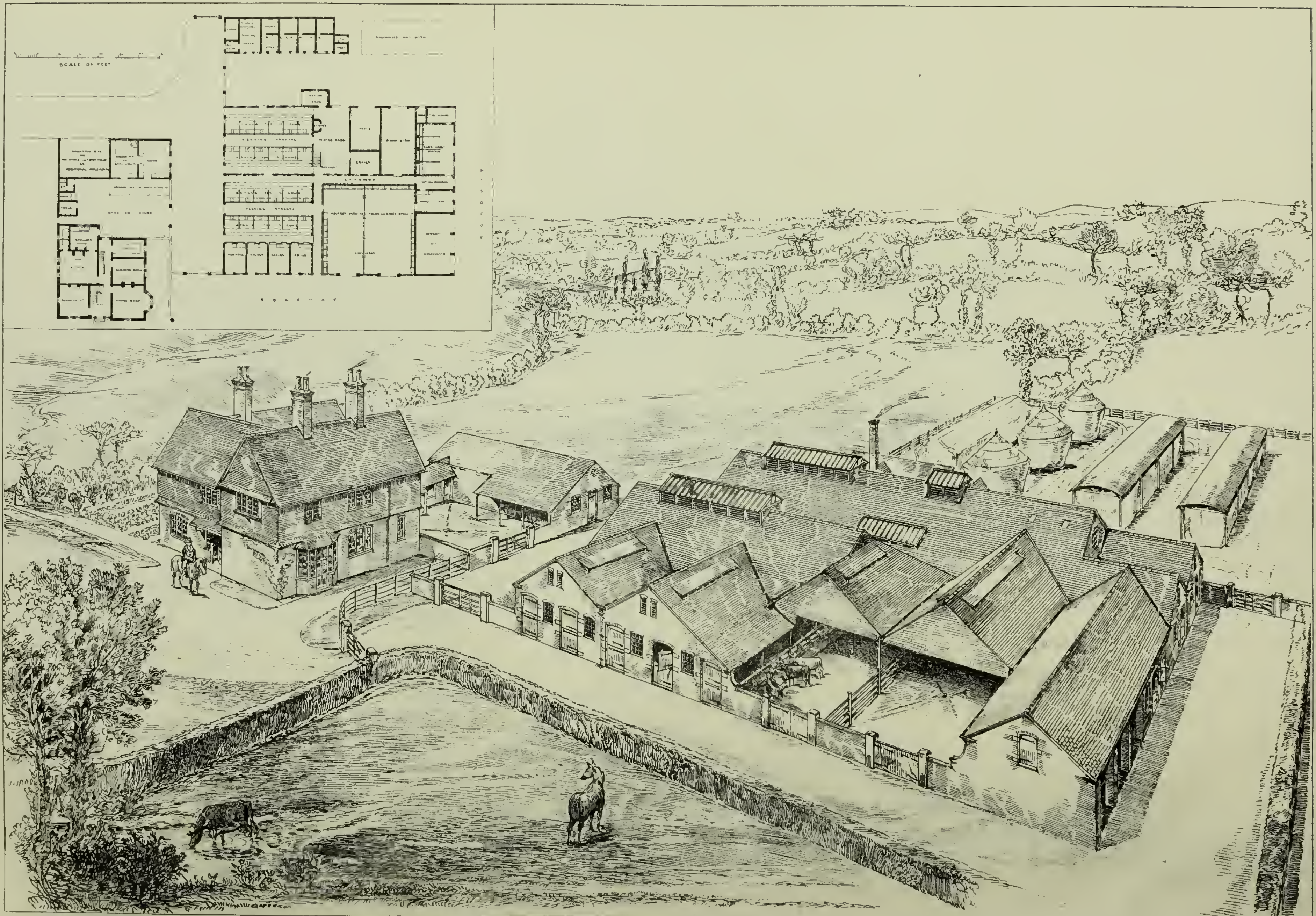
L



St Matthew's: Church: Newcastle: upon Tyne:

Austin: Johnson: & Hicks: Archts: Newcastle upon Tyne

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W C

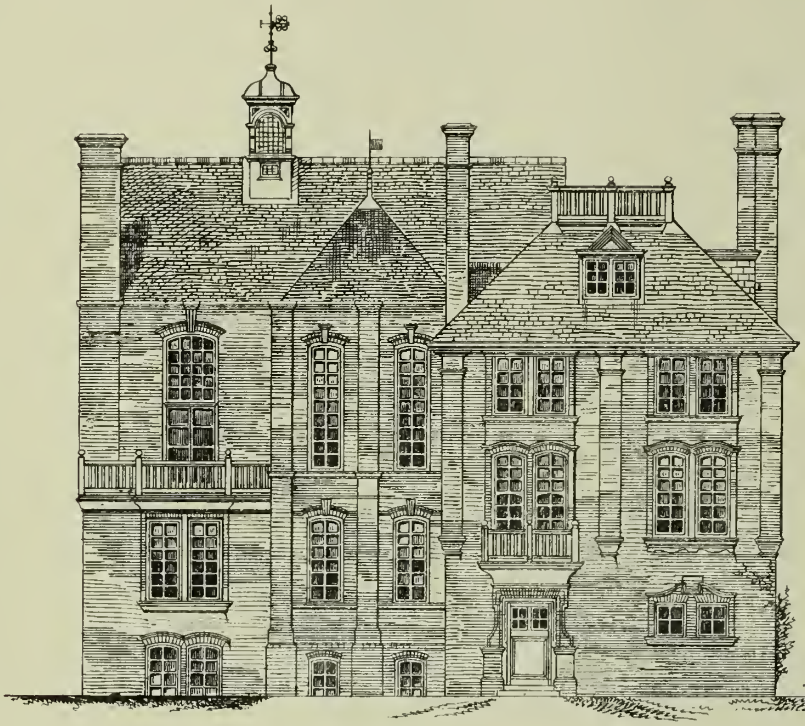


B.D.F.A. FIRST PRIZE MEDAL DESIGN FOR A HOMESTEAD FOR 50 COWS. RICHARD WAITE ARCHITECT

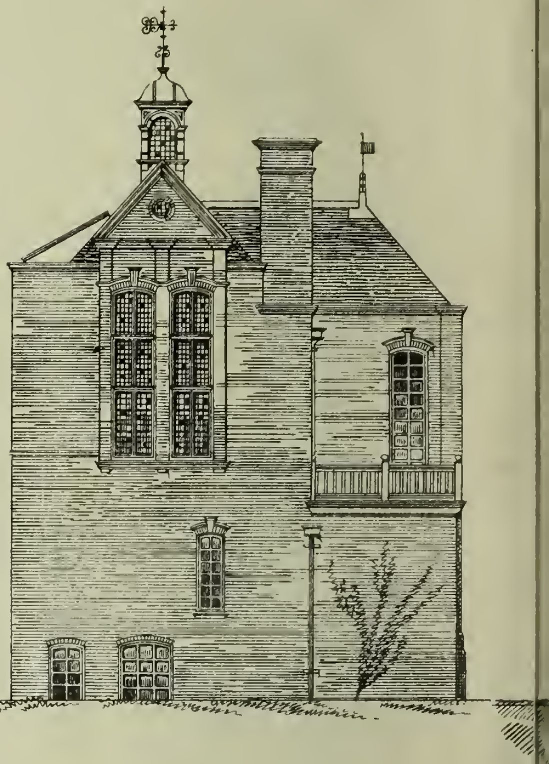
Photo Lithographed & Printed by James Akerman.

ARTISTS' HOMES N° 9 · House and Studio Holla

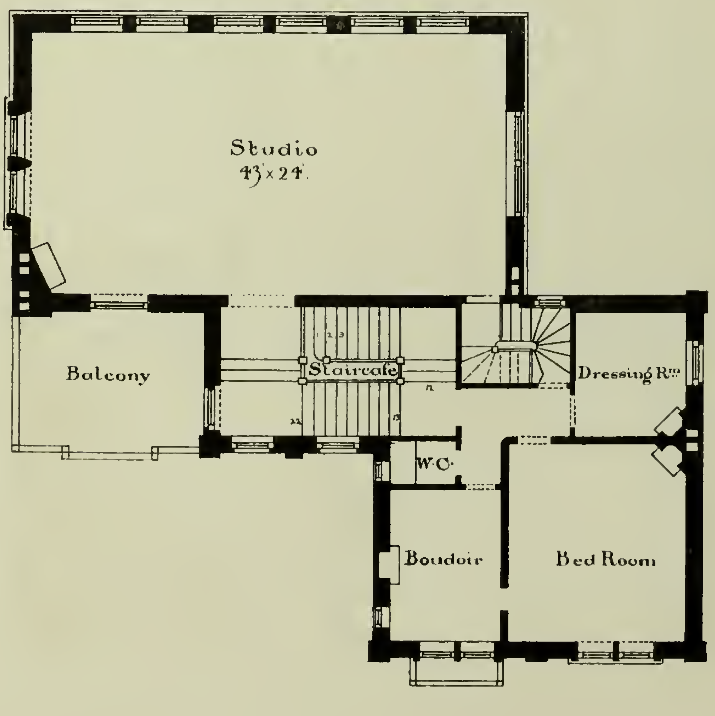
GENERAL DRAWINGS



Front · Elevation ·

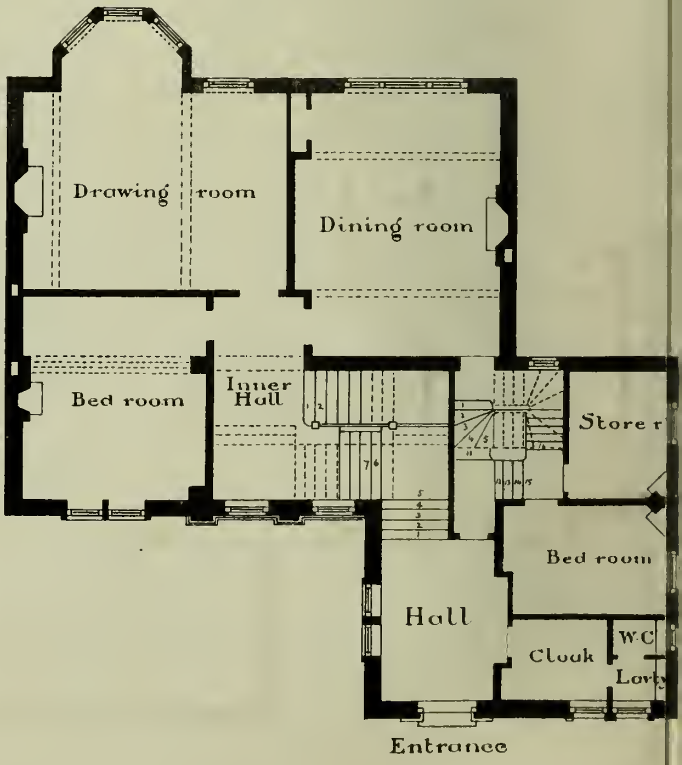


West · End ·



MAURICE B ADAMS DELT

First Floor Plan

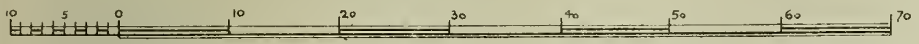


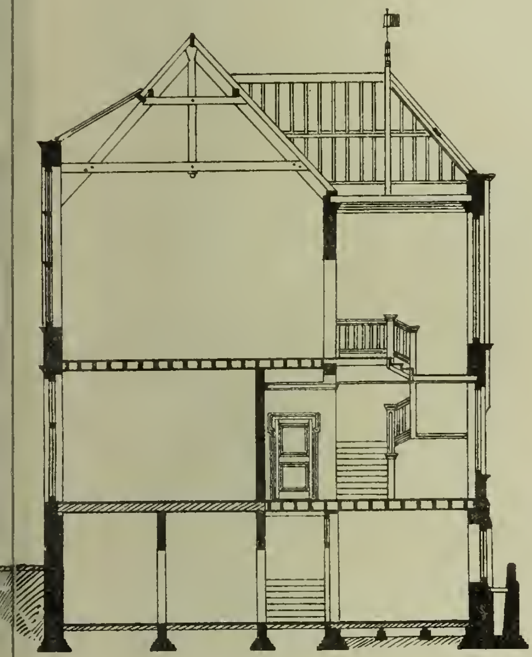
Ground Plan

d Park Kensigton for S. Luke Fildes Esq^{re} A·R·A·

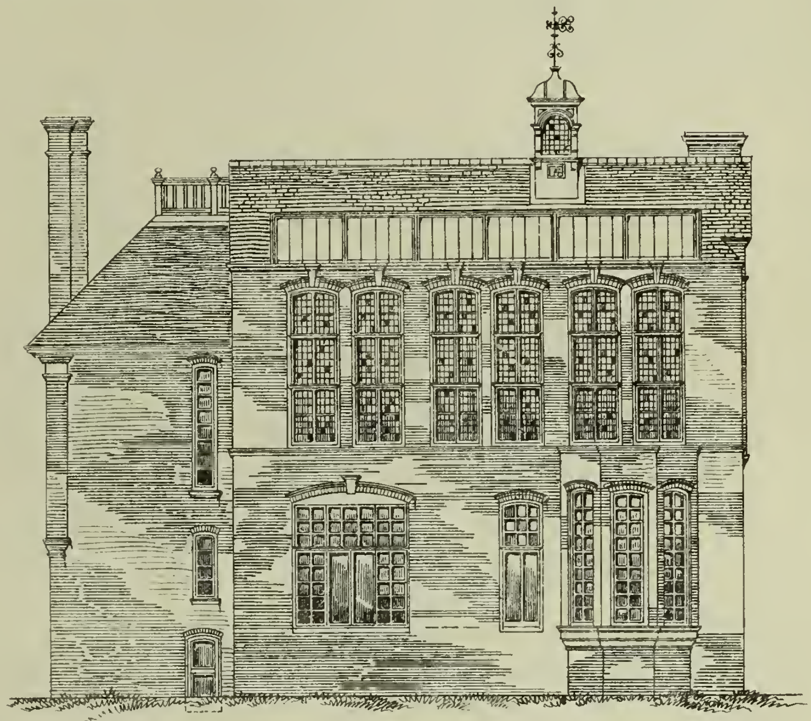
R. NORMAN SHAW R.A.
ARCHITECT

Scale of feet

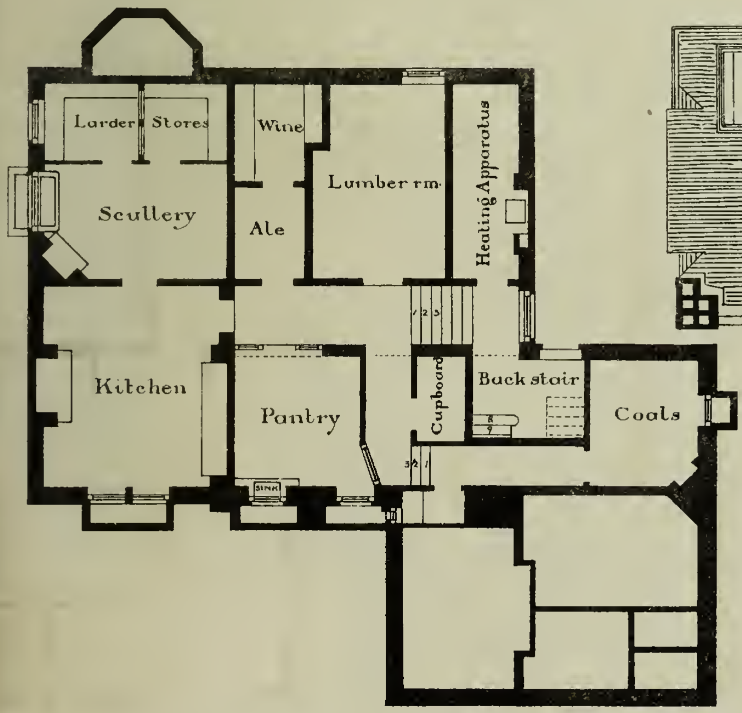




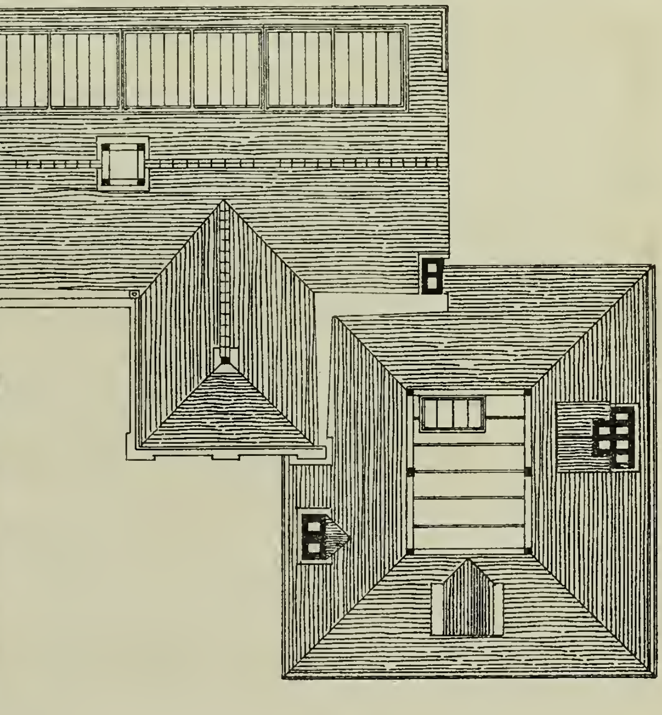
+·Section·of·Studio



Back · Elevation ·



Basement Plan



Roof · Plan ·

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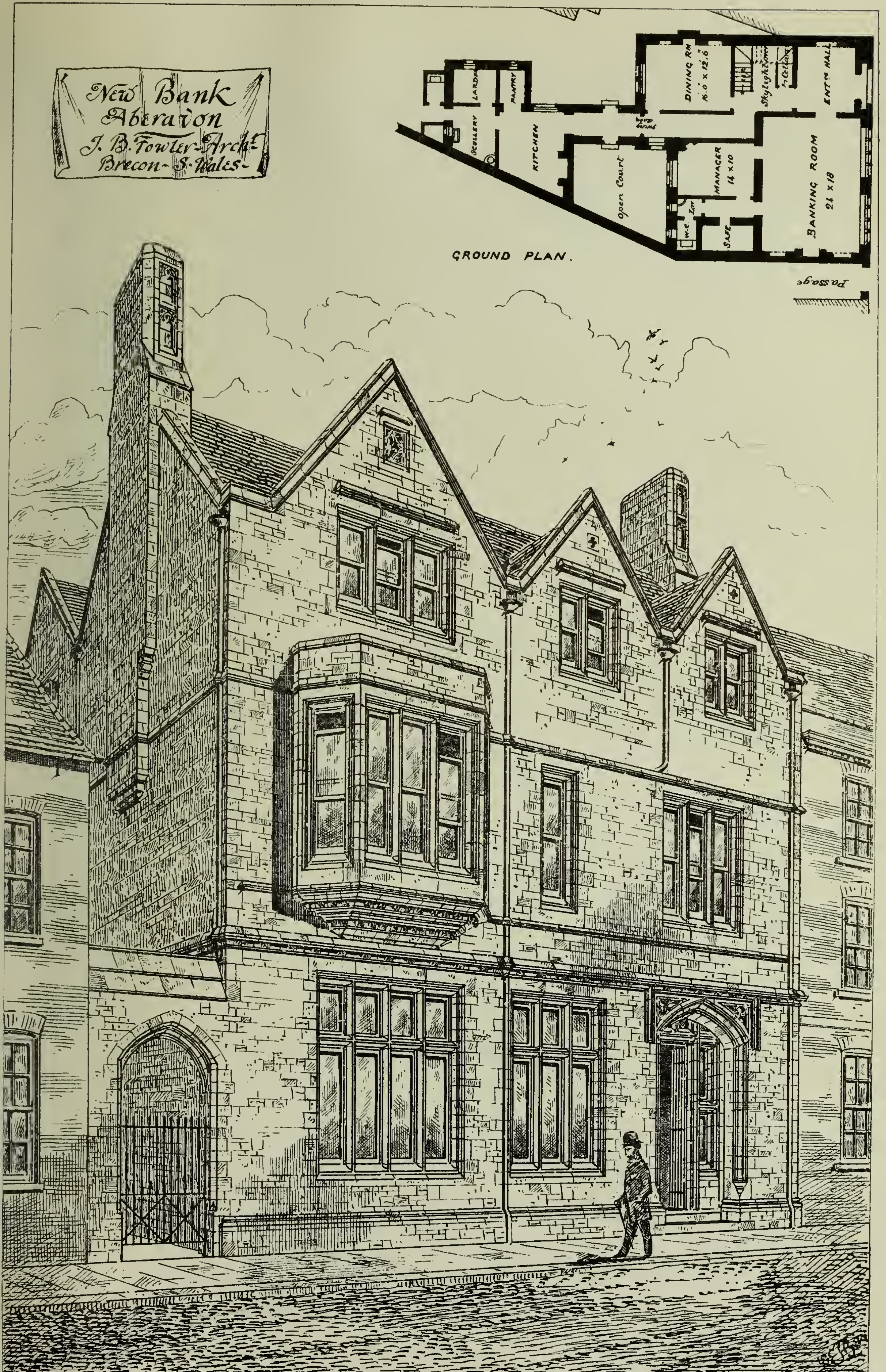

:Glamorganshire Banking Company Limd:

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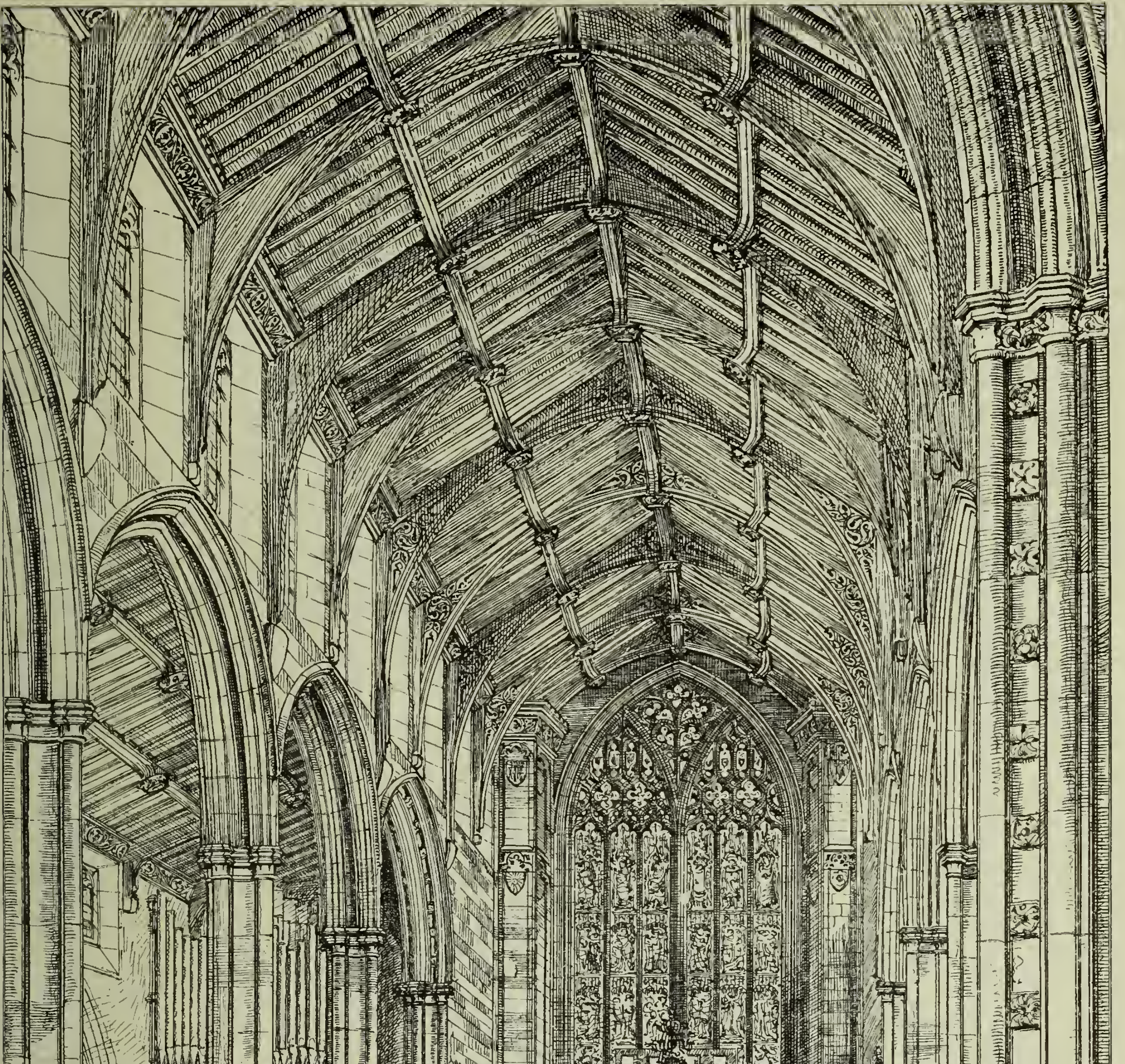

St Matthew's: Church: Newcastle: upon: Tyne:

Photo Lithographed & Printed by James Akerman, 6, Queen Square, W.C.

Austin: Johnson: & Hicks Archts: Newcastle-upon-Tyne:

COMPETITIONS.

Liverpool School of Art Competition.—The Directors of the Liverpool School of Art, some time since, offered premiums of one hundred guineas and twenty-five pounds for the first and second best designs for a new School of Art, to be erected in Mount-street, Liverpool. Ninety-two architects responded, and at a meeting on Monday night, the directors determined to award the first premium to Mr. Thomas Cook, of 12, St. George's-crescent, Liverpool, the author of the design sent in under the motto "Fides," and the second premium to Mr. C. O. Ellison, of 62, Dale-street, Liverpool, author of the design marked "Let there be Light." In Mr. Cook's design, which we shall illustrate shortly, the entrance vestibule, 11ft. wide, is placed in centre of front to Mount-street, from which, by an ascent of three short flights of steps, the ground-floor level is reached, and by cross-corridors of communication and main staircase access to the various rooms is gained. On ground-floor the accommodation comprises two elementary-rooms, architectural, modelling, store, and attendants' rooms, also male and female lavatories and cloakroom; and on first floor, two antique rooms, painting life class, and head master's rooms. The various rooms will be warmed by open fire-places, and ventilated by means of Tobin tubes and Messrs. R. Boyle and Sons patent air-pump ventilators. The building is designed in the Queen Anne style, and is proposed to be faced with Hollington stone, the estimated cost being £10,600. We regret to state that we have not been allowed to see the designs, and that, in his official letter to the competitors announcing the decision, the secretary states that the directors have decided not to exhibit them. Very great dissatisfaction exists among the competitors generally, and some statements have been made to us which, if true, amply justify discontent. We may have more to say about the matter next week. It was understood generally, by the competitors, that a professional referee would be consulted, and that this was the case, the following letter, written by the secretary, three months since, to one of the competitors, will show:—

PROPOSED SCHOOL OF ART.

Dear Sir,—I am requested by the Directors to inform you that, while they do not bind themselves to appoint a professional referee, they think it probable that they will avail themselves of his advice in coming to a decision upon the designs sent in.—I am, yours faithfully,

Charles Sharp, Sec.

Liverpool Institute, Sept. 28, 1880.

We are very sorry to see that the apprehensions expressed by a correspondent last week seem not to have been entertained without good grounds, and that a competition which, above any other, ought to have been fairly and justly conducted, has ended in the way it has.

The Raikes Memorial Church Competition.—The Committee, with professional assistance, have selected the design by Mr. Capel N. Tripp, of Gloucester. They have refused us and others a view of the drawings, though the drawings were on view in the early stage of the competition to a few persons, including some of the competitors. The committee are all gentlemen of good position, and no doubt could give reasons for the course they have adopted; but as this is a public competition with public funds, a fair review of the drawings would have been more satisfactory to the competitors and the profession.

SCHOOLS OF ART.

City of London.—The annual distribution of prizes to pupils in this school took place the other day at the School-hall, Skinner-street, Bishopsgate. The report stated that the financial resources of the school were at a low ebb. Fifteen second-grade, and three third-grade prizes were gained at the Departmental examinations, and a number of certificates. The Clothworkers' Company, the Painters' Company, and the Baroness Rothschild have also given prizes. The chairman urged the necessity for the removal of the school to a larger, more eligible, and convenient site, and said that only four or five of the wealthy City Companies had given the committee help towards doing this.

Hastings and St. Leonard's.—The fifth annual meeting and distribution of prizes in connection with this school was held on Thursday, the 9th inst., in Mr. Brassey's new buildings at Claremont, Hastings. The annual report stated that the art classes had been well attended, and most satisfactory progress had been made by the students, but the artisan and science class had not been so well patronised. Mr. Sullivan, the head-master, reported that there was a total of 242 students in the art classes, and that 2,510 drawings had been produced during the year. At the local May examinations, 18 prizes and 43 certificates had been gained. In the building and geometrical drawing classes 19 succeeded of 27 examined, and gained eleven prizes. From South Kensington, one National Competition book prize and 7 third-grade prizes had been gained by works. Mr. Thomas Brassey, M.P., delivered an address, in which he expressed his pleasure at having been the means of establishing the school of art, by which every artisan in the town had the power placed within his reach of becoming an architect or master builder. He paid a high tribute of praise to Mr. M. Sullivan, to whom an address and a purse of £30 was presented in the course of the evening on behalf of the students.

Tonbridge.—The distribution of prizes and certificates at this school took place on Thursday, the 2nd inst. The report showed that there were, last session, 54 students; 23 were examined in April, of whom 17 passed, and 3 obtained Queen's prizes; 383 works of students were sent to South Kensington, of which one obtained a bronze medal, another a third-grade prize, and 134 were awarded second-grade prizes. The Government grant showed an increase of more than one-fourth on that of the previous year.

York.—The annual meeting of the York school of art was recently held, under the presidency of the Dean of York, who, in his address, urged the students to a study of the great masters, and remarked that schools of art were not training up a race of future artists so much as developing talents which would tend to the future happiness and intelligence of the nation. The committee, in their report, expressed regret at the loss of the services of Mr. J. S. Dominy, who had conducted the school for ten years, and believed that they had secured a fitting successor in Mr. Kean. In the Government examinations the pupils of the school had not been so successful as in former years. Only one third-grade prize had been taken as against nine last year. For the second-grade examinations there were 35 candidates, of whom 21 were successful, 8 of them being marked excellent; as against 32 candidates last year, with 20 successful, and 7 marked excellent. In order to encourage the attendance of artisan students, the fee had been made as small as possible (five shillings).

ARCHITECTURAL & ARCHÆOLOGICAL SOCIETIES.

Birmingham Architectural Association.—An ordinary meeting was held on Tuesday evening last at the rooms of the Association, Queen's College. Mr. R. B. Morgan, chairman of the Association, presided. The following new members were elected.—As honorary members, Mr. T. F. Proud and Mr. A. Clere; as ordinary members, Messrs. Frank Simon, J. S. Webster, Edward Mansell, J. H. James, and J. Ellis (Walsall). After the business, a paper on "Poetry in relation to Art," was read by Mr. T. W. Camm. At the conclusion of his paper, a hearty vote of thanks was accorded to Mr. Camm.

◆

Mr. J. T. Harrison, C.E., one of the inspectors of the Local Government Board, held an inquiry at Sunderland, on Monday week, respecting an application from the town council for sanction to borrow £17,420 for paving and flagging a number of private streets, £1,200 for laying out Roker-park, and £910 for laying out Burns-field as a public recreation-ground. Objections were raised that the town council's charge for private street works were excessive, but the inspector said he could not deal with the point.

A chancel is about to be added to St. Augustine's Church, Halifax, from the designs of Mr. C. F. H. Horsfall, of the town. It will be apsidal, 41ft. long by 23ft. wide, and will be lined internally with stonework, the roof being of high pitch. It will be lighted by three two-light geometrical windows, each 22ft. in height. On the north and separated by a Gothic pitch-pine screen, will be an organ-chamber 16ft. by 22ft.

Building Intelligence.

Dallington.—The parish church of Dallington was reopened on Tuesday week after restoration. The porch on the south side has, for the most part, been rebuilt. The roof has been restored and re-stuccoed within. A considerable portion of the north aisle has been rebuilt, the clerestory windows have been restored, the tower has been restored externally, including belfry windows, and the mortuary chapel on the north side of the chancel has been utilised as a sacristy and organ-chamber. The aisles or passages have been laid with tiles from Messrs. Maw and Co. The works have been carried out under the superintendence of Messrs. E. F. Law and Son, architects, Northampton, by Messrs. Roberts and Son, of Weedon. The cost will be about £1,400.

Darwen.—The new Conservative Club at Darwen was formally opened on Thursday, Dec. 9th, by the Right Hon. Colonel Frederick A. Stanley, M.P. The building is in the Gothic style, and has been erected from the design of Mr. W. Perry, architect, of Market-street, Darwen, and Lord-street, Southport. The principal façade fronting Church-street, is faced with parpoints, which, together with the dressings and other stone-work, have been obtained from local quarries. All the windows have bold splayed heads and sills, each window being recessed 6in. so as to present a more imposing appearance. The elevation to Church-bank-street, is built of brick, with stone heads and sills corresponding with those of the principal front. The building is oblong in plan, and is admirably suited to the purposes for which it is required. There are two main entrances in Church-street. All internal walls are coloured in distemper, and the cornices to the several rooms are massive. The building is well lighted and ventilated, and is heated by hot water. The acoustic properties of the hall have been well tested, and the results are thoroughly satisfactory. The general contractor was Mr. J. Pilkington, Darwen.

Metropolitan Board of Works.—At the meeting of this board, held on Friday, it was resolved to contribute £6,400, being half the estimated net cost, towards the improvement about to be carried out by the City Commissioners of Sewers in Lime-street and Fenchurch-street. It was decided to reply to a complaint from the vestry of Bermondsey as to the flooding of basements in that parish, that the Board have under consideration plans for the construction of a sewer to prevent such floodings. Drawings submitted by Mr. Sefton Parry for the construction of a new theatre, proposed to be erected on the vacant plots of land, Nos. 30 and 31, in Northumberland-avenue, were approved It was resolved to widen Vauxhall-bridge, by the projecting of a new iron railing upon cantalivers, at a probable cost of £7,000; and an unfavourable answer was ordered to be sent to the South London Tramways Co., who had memorialised the Board to reserve space on the proposed new bridges at Battersea and Putney, for a line of tramway. Boring works are about to be commenced, under the supervision of the engineer, in the foundations of Waterloo-bridge, and the Wandsworth-bridge is about to be wind-braced. A report was read by the solicitor to the Board on an inquiry held on the previous Wednesday, in the Sheriffs' Court, under the Artisans' Dwellings Act Scheme. The Board appealed against the award of Mr. Hunter Rodwell, Q.C., as to the value of 13 houses held on long lease in Castle-alley, High-street, Whitechapel; also a leasehold interest in 8, 9, and 10, Inkhorn-court, and a copyholder's interest in six houses in the same court. It was, said the solicitor, impossible to speak too strongly of the disgraceful character of these premises, the approaches from the High-street being some 3ft. wide, the courts of wholly insufficient width for sanitary requirements, and the houses in a wretched state of disrepair and dirt. Claims were made for £6,675, and the Board's valuation was £2,771. Mr. Rodwell's provisional award was £3,100, subsequently increased to £4,874. Against this the Board appealed, and the jury gave a verdict for £2,770, the sum at which the board had at one time valued the property. A report from the Building Act Committee was adopted, in accordance with which the district of Streatham and Brixton, a surveyorship now rendered vacant by the death of Mr. Mullins, will be divided into two districts to be known as East Streatham and Brixton, and West Streatham, the boundary line to be the centre of Brixton-hill, Streatham-hill, and Upper and Lower Streatham. The election to both offices will take place to-day (Friday).

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TO CORRESPONDENTS.

[We do not hold ourselves responsible for the opinions of our correspondents. The Editor respectfully requests that all communications should be drawn up as briefly as possible, as there are many claimants upon the space allotted to correspondence.]

All letters should be addressed to the EDITOR, 31, TAVISTOCK-STREET, COVENT-GARDEN, W.C.

Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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Front Page Advertisements and Paragraph Advertisements 1s. per line. No front page or paragraph Advertisement inserted for less than 5s.

Advertisements for the current week must reach the office not later than 5 p.m. on Thursday.

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N.B.--Cases and vols. must be ordered through a bookseller or newsagent, as the regulations of the Post-office prevent them from being sent by post.

Received.—E. W.—J. C.—C. W. and Co.—C. of K.—T. W.—E. P.—W. J. B.—Rev. F. G.—B. and H.—W. H. S.

Arthur. (Enquire at Rivingtons' or Masters'.)

"BUILDING NEWS" DESIGNING CLUB.

Enetvant, Will (your letter fails to challenge the merit of the design placed first), Beta, Walter.

Drawings Received.—One of the Crowd, Ralph, Milverton, York, Clavior Etenchus, Kismet, I will Either make a Shaft or a Bolt of it, En Avant, Reginald, G. W. W., Hubert, Rex, Ernest, Motto A., Heart of Oak, Walter, B. J., Ambition, Beta, Veritas Vincit, Subjudice, Jack, Dum Vivo Cantabo, Semper Paratus, Nitor, Such a Dog, Con in circle, Endymion.

LIST OF SUBJECTS.

A. A block of almshouses for eight inmates, four of each sex, situated on a corner site with a 10ft forecourt to each frontage. Conveniences to be shown. Plans, elevations, and section with a sketch perspective. Drawings to be ⅛th of inch to foot.

B. A lectern in wood for a parish church in Queen Anne, and also a font cover. Elevation and sketch. Inch scale, with details.

Correspondence.

LIVERPOOL SCHOOL OF ART COMPETITION.

To the Editor of the Building News.

Sir,—Your correspondent "Surprised" seems to have been very much behind the scenes in the above matter, and it would be interesting to know how he came to learn that there were several F.R.I.B.A.'s in the above competition, seeing that all the designs were required to be sent in under motto; also his authority for saying that there is the prospect of a general scramble, with the probable result that the most proficient "tout" among the 75 competitors will secure the prize.

Now, as one of the F.R.I.B.A. competitors, I may say that after I had perused the particulars of the competition, I came to the conclusion that as competitions go nowadays, this one promised a fair decision, the more so as on running over to see the site, the secretary, Mr. Sharp, told me that it was the intention of the directors to call in a professional man to assist them in settling the prizes. Another condition also assured me—viz., the one forbidding canvassing.

I was at considerable trouble and expense in sending a clerk over to Liverpool to deliver my drawings in order the better to avoid identifications, and if the directors act in as good faith as I have done, I shall be perfectly satisfied with the result.

Your correspondent must not run away with the impression that because the memorial to the R.I.B.A., praying that body to take the subject of the present unsatisfactory state of competitions into its consideration, that those architects who signed it are, therefore, to be debarred from entering a competition in the mean time.

No one longs for the time when more equitable conditions will be the rule rather than the exception than I do; but that happy time can only be arrived at by united and determined action on the part of the Institute, and the numerous architectural associations throughout the country.—I am, &c., H. W.

Sir,—The above competition is another proof that something must shortly be done to rectify the present disgraceful mode of carrying on competitions.

This one appears to have been run with about as much honesty as the members of a long firm go to work in securing goods for nothing, or it may be said to resemble the "confidence trick" (the silly competitors being the dupes), for attempting which many a man has served years of imprisonment.

Is it because the directors dare not face public criticism that the designs are not publicly exhibited, or what? Would it not do the Liverpool Architectural Association (who are on the spot) much credit to inquire into the rumours afloat, and, if needs be, make an example of the directors for breach of contract, or at least show up the dishonourable competitors who have, it is said, been unscrupulous enough, to canvas the members of the committee, although it was specially forbidden by the conditions. One good case decided in favour of the competitors would put a check on competitions, and do the profession immense good, and this instance seems to promise well in our favour.

At the outset, I had the assurance of the secretary that a professional referee was to be called in. Can any of your readers say who was the man? As your correspondent, "Surprised," would have us believe, the committee settled the *job* themselves.—I am, &c.,

Dec. 15. A Competitor.

GLASGOW COMPETITION.

Sir,—The letter of "Old T Square" has led me to look at my notes of the above exhibition again, and I find that out of the 96 designs submitted, about 60 have disqualified themselves by contravening the clear instructions as to the preparation of drawings ("Old T Square" is one of the 60, through "blacking in" his windows), and of the rest about 30 are clearly out of court by disregard of cost.

The award of the premiums among the few left (and some of them are most creditably studied) would be an easy task This done, any other design could be selected for execution, although, like my own *avowedly* is, it may be too costly for the competition limit.

But my chief object in writing is to call attention to the fact that architects at large, as seen in the above figures, are not honest in this kind of business; and, until they are, they must expect no reform in competitions. Near two-thirds of the whole have here sought to gain effects unfairly by mere drawing, and nearly one-third more by elaborateness of design, while many of the first-named delinquents are also guilty of the latter charge as well. There are one or two exceptions among them who honourably *declare* their intentional excess of the cost allowed. But the great bulk are at fault. Can they complain if a town council and referee have for six months past proved unequal to doing justice?

And, as to professional referees, here is an ex-President of the R.I.B.A., who has missed a magnificent opportunity of using his great influence in the right direction.

I was thankful to know he had taken this post at Glasgow, but the result is altogether discouraging.

Had he studied the few which are fairly in the contest, though domeless and towerless, and given the premium among them, he need not have cumbered and confused his report with a laboured justification (*qui s'excuse, s'accuse*), but would have occupied an impregnable position against both town council and competitors, and would have read a most wholesome lesson to the profession for its dishonesty, and to corporations for instructions whose terms insure disappointment. This would have had an effect vastly more beneficial to the whole system of competition than any rules and regulations that could be devised. The remedy for competition evils lies mainly with competitors, and far less with those against whom they so often complain.—I am, &c.

Dec. 13. Another Competitor.

PONTEFRACT TOWN-HALL COMPETITION.

Sir,—My attention was arrested while reading your issue of the 10th ult., by a letter bearing signature "Queen Anne," and dated from Leeds, on the subject of the recent Pontefract Town-hall Competition, in which the writer uses a sentence which occured in your critic's report on the designs, appearing in your paper a week previously, as a handle to praise up his own plans, and at the same time to run down those of another competitor, to wit, "Renaissance."

As regards the merits of the two sets of plans, I am quite content to leave the case in the hands of the referee, who, it is just possible, may have different opinions on the subject to those expressed by "Queen Anne," and I should not have troubled to reply to the letter, had not the writer made some unjust comparisons requiring contradiction.

"Queen Anne," in speaking of "corridors," insinuates that those of design bearing motto "Renaissance," are deficient in light and convenience.

As regards convenience, I am at a loss to know what better arrangement could be desired, and with respect to the all-important element of light, they are in no way deficient, the central corridor, running parallel to Baxter-gate, being lighted at the end by a large window, and by three side-lights in its length, two from municipal and police lobbies opening and having windows into Baxter-gate, and the third from a lobby opening into a good-sized area at the back of the building.

It is just possible that "Queen Anne" had an idea that a large window at the end of the central corridor could not be managed in that particular position; but if he had taken the trouble to accurately survey the surrounding property, and obtain the heights of the respective buildings, he would have found that there was only a low out-building at that point, from 7ft. to 8ft. high, and as the floor-line of the building (owing to the fall of the ground) is 5ft. above the ground-level, it will readily be seen that by placing the window sill 3ft. above the floor-level, it is possible to light over the roof into a yard behind, and obtain as much light as can be desired.

Again, according to "Queen Anne," it appears that the staircase in my designs, is in a "side, badly-lighted recess."

This assertion may be disposed of as being positively incorrect.

The staircase in question ascends out a good-sized hall, opening out of the main vestibule opposite the entrance by means of two wide coupled arches, thereby making the two halls or vestibules practically one, and is lighted by a large three-light window, occupying the whole of one side of the hall, opening into an area of respectable dimensions, and is, moreover lighted from the roof above by a large lantern, carefully shown on the sections, which, I presume, "Queen Anne" has forgotten to look at.

He, or rather she, I suppose I should say, complains of a council chamber being provided, saying that it was not required!

By referring to the conditions, it will be found that a large committee-room is asked for, and, understanding that it was to be used as a meeting room for the Council, I had no hesitation in designating it as the "Council-Chamber." At the same time I arranged for another smaller room in close proximity to it, for committee purposes.

Then, as to the "Cells," until the referee's award is made, I do not feel disposed to argue upon the question as to where they should be placed, and whether it is better to have them on the ground-floor, occupying valuable space, than in the basement, where they may be well-lighted and ventilated.

In conclusion, I trust it will be seen from the tenour of my letter, that I do not attack or allude to the plans of "Queen Anne" or any other competitor, and should be sorry to do anything in such bad taste, but merely have written to refute injurious statements which, should the referee see them, might possibly prejudice any chance I may have of success.—I am, &c.,

The Author of Designs bearing motto "Renaissance."

THE STRENGTH OF OUR RAILWAY STRUCTURES.

Sir,—Taking the advice of Mr. W. G. Lees, I obtained the services of a very small schoolboy, and asked him to account for the 50 per cent. decrease in the strength of a bridge, when the rolling-load was increased 100 per cent., and he came to the following results. Assuming a bridge under the following conditions:—

Span .. .. = 100ft.
Depth of girders .. = 10ft.
Weight of structure = 1 ton per foot run
Rolling-load .. = 1½ tons ,,

then the strain on the top and bottom flanges would be

$$S = \tfrac{1}{2}\,\frac{100 \times 250}{80} = 156{\cdot}25 \text{ tons.}$$

If we now double the rolling-load, the strain, according to Mr. Lees, ought to be 312·5 tons; but, strange to say, the following result was obtained:—

$$S = \tfrac{1}{2}\,\frac{100 \times 400}{80} = 250 \text{ tons.}$$

I am afraid I must have obtained much too small a boy; but no doubt the superior mathematical knowledge and professional experience of Mr. Lees will set us straight in the matter.

The question of the stability, &c., of our railway structures is, no doubt, a most interesting subject; but nothing can possibly be gained by uttering such replies as were contained in Mr. Lees' last letter. I asked him several straightforward questions, and get nothing in reply but assumptions of other people's ignorance.

He says that the 4¼ tons was the nearest approximation to the Board of Trade requirements; since his assertions were the result of mere guesswork, why approximate at all, why not quote the actual requirements? It is very like the odd 1s. 9¾d. we see occasionally in estimates of many thousands of pounds.

He also states that the locomotives he spoke about, as weighing 80 tons, are running on the Midland and other railways. I say most positively that no such locomotive has ever been built, and most probably never will be, unless they be for the proposed ship-railway across the Isthmus of Panama. 45 tons is a heavy weight for a locomotive, even when in running order.

He then states that the question of "elongation of fibre and detachment of particle" would occupy too much space in a letter; but as his remarks on this novel phenomenon would be of great interest to many of your readers, I hope you will grant him space to enlarge upon the subject.

Nothing further is said about the Report he quoted. Will he oblige us with the date and circumstances, as it must be a most interesting document?

He again makes the statement about not being able to obtain iron to withstand 20 tons per square inch—I think he said 18 tons in his first letter. It is simply absurd; *any* good firm will be glad to supply him any amount to withstand that and more—at least, that has been my experience in some 200 bridges and other structures which I have designed; but, of course, that limited experience cannot well be compared with that of a man who has painted so many bridges, floors, &c.—I am, &c.,

Hull, Dec. 14. John J. Webster.

ST. ALBAN'S ABBEY.

Sir,—Your well-known energy, and Sir Edmund Beckett's desire to be obliging, have done good service to us who wish to see beforehand what we have to expect. One cannot readily forget previous works designed by Sir E. Beckett, such as Batchwood and the St. Alban's rectory. They bear about the same relation to works of real architecture as the maunderings of an illiterate person bear to Sir E. Beckett's pointed pleasantries. The Building News of the 26th Nov. has, however, shown to us work of a very different stamp. Sir Edmund took occasion to praise his incapacity to draw when discussing competitions at the Institute in February of this year. The west front really makes one believe that he has had lessons in the interval, and has thus been able to convey something more to the designer who is doing his work at present than the directions with which the other designers had to be contented.

The new design actually bears some relation to works of genuine architecture—some relations, be it understood—about the same that Sir E. Beckett's pleasantries, before alluded to, bear to works from master-hands, such as the earlier letters of "Junius," as "Vanity Fair," or as "Gulliver." To point out faults of grammar and style in this design may seem like neglecting for lighter matters the weightier. Still, I am sure that the repetition in an exaggerative form of the defects of the present west window, and the crowded arcades on the aisle walls, and the turrets which call the eye away from the central gable, have not impressed favourably even important persons. The monotony produced in the three gables of the porches by their being almost on the same plane, the greater distance between the arches and the copings of the side porches—beyond that in the central porch—the repetition of the same details in the tympana of the gables, are merely three instances among a great number, and the way in which, out of two or more courses, an unhappy one has been chosen.

But when anyone attempts to pass from technical criticism to that higher criticism, which deals with the spirit as distinguished from the matter, he is met by an almost insurmountable difficulty. Without common ground to go upon, it is difficult to do more than make oneself heard. Trained architects, and trained critics of architecture, do not need to be told—for they feel instinctively—when jejuneness and dulness are shown, and the absence of that sense of delight which makes a work of art pleasurable to its creator, and thereafter to others. And just as some people do not need to be told, there are many others—the majority, one fears—who might be told for ever, and be no wiser; such people should either be modest and stand aside, or should put themselves to school till defects of nature or education have been remedied. I do not imagine that there can be much difference of opinion in relation to this design. I should rather expect a consensus of opinion. Perhaps even Sir E. B. may be influenced by such a consensus. If he can be persuaded to postpone the exercise of his well-intentioned liberality till he really knows what he is doing, we will honour him for a display of courage of which plenty of people more pugnacious than he is would be incapable.—I am, &c., A. W. W.

Sir,—In reply to the letter from "Amateur," last week, I think I may safely say that there is not one architect of reputation who does not look upon Sir Edmund Beckett's design for the west front of the abbey with sorrow and disgust. It is, of course, the production of an amateur, and, therefore, it would be scarcely dignified for professional architects to criticise it, were it worthy of serious criticism, which it certainly is not. Probably this is the reason the matter has not been discussed in your columns, the profession thinking it better to treat it with the silence and contempt it deserves. But Sir Edmund is not an ordinary amateur; inasmuch as he seems unwilling to learn, and appears to think that he knows far more already than any architect can teach him, and I feel sure no one will ever succeed in convincing him to the contrary. In fact, having acquired that dangerous thing, a little knowledge, he straightway presumes to set up as a teacher, rather than a pupil, of those whose whole lives have been spent in a study of which he has little more than a mere smattering, and when they decline to receive him as an oracle, he does his utmost to disparage and call in question the honour of architects as a body, which it would be faint praise indeed to say is composed of as honourable men as are to be found in the ranks of his own profession. There is a well-known saying, and one in which no doubt Sir Edmund agrees, that "the man who acts as his own solicitor, has a fool for his client." Has it never occurred to him that this may apply to other professions besides the law? It would be an insult to an architect of Mr. John O. Scott's ability, to attempt, were it possible, any comparison between the two designs, yet I venture to say that Mr. Scott would have produced a work far more worthy of his reputation, had be been unfettered by Sir Edmund's wishes or whims. The design is a matter of great importance, and requires the skill of an experienced architect. What would Sir Edmund think of a man who selected the youngest and most inexperienced member of the Bar to conduct one of the most important cases that could arise in a Court of Law? Yet his action in this matter is even worse, for he intends to conduct his own case! He has already attempted to show architects how to build a house, and the result is a signal failure. His design for the west front of the abbey, if it should ever have the misfortune to be built, will be a far more disastrous failure, and will be a monument—well, not of his wisdom. It has been said that Mr. Scott's design was given in a form more advantageous to the eye than Sir Edmund's. If you gave a perspective view of the latter you would prove the contrary, as its inherent defects would be made far more apparent, and, I think, perhaps even Sir Edmund might begin to feel less self-satisfied with his production. His projected arched sill, to carry the great weight of the mullions and glass of the ill-conceived west window, is in itself enough to condemn the scheme, and prove it to be the work of an amateur unacquainted with the first principles of building construction. I should be ashamed of any pupil in his second year of service, committing such an absurdity.—I am, &c., Hugh Roumieu Gough, F.R.I.B.A.

6, Queen Anne's Gate, S.W.

THE FUTURE OF CEMENT.

Sir,—Until I reached the final paragraph of Mr. Reid's letter I was at a loss to understand the cause of his attack upon my paper at the Architectural Association; but he is evidently smarting under a previous grievance and from a rebuke, which he brought upon himself, by his statement at the Institution of Civil Engineers that "it was difficult to understand why (in the manufacture of Portland cement) there was so great a desire for the utilisation of waste heat." This question I will not now reopen, but will confine myself, with your kind permission, to a reply to Mr. Reid's present strictures.

You, Sir, can easily defend yourself from the charge of writing down to the level of my paper, "devoid," as Mr. Reid tells us it was, "of all practical utility," and "tending to convey erroneous impressions on the subject of cements generally"; but, perhaps, I may say on behalf of those "learned theorists" who are no more, but of whose labours Mr. Reid has so amply availed himself in his writings, that their opinions are, in my humble judgment, preferable to the second-hand chemistry of the author of "The Science and Art of Portland Cement."

The disquisition with which we are favoured, on the use of limes by the Ancients, does not disprove a single statement in my paper, and requires no answer. Mr. Colson's views are next attacked, or rather, a supposititious argument imputed to him; and here I may observe that Mr. Colson's paper, published in the *Transactions* of the Institution of Civil Engineers, contains more original matter than any six of Mr. Reid's bulky compilations. I do not, I must confess, understand the allusions to "sulphuring," "selenitising." and "scientific mortar ingredients," so I will leave this point until more information is forthcoming.

Mr. Reid finds it necessary to ignore the whole drift of my argument in order to prove me wrong in the matter of quartz sand, and, without the context, my statement, as he quotes it, is liable to be misunderstood. Mr. Spiller's observations, which, by the way, Mr. Reid has incorporated in one of his books, are known to me. The immediate action of pure hydrate of lime on quartzose sand is inappreciable; but when, as I say, other bases are present, and during the gradual recarbonisation of the hydrate of lime in the course of ages, some slight quantity of silicate of lime is formed, which must, I maintain (*pace* Mr. Spiller), be due to the action of the lime on the sand particles.

As Mr. Reid apparently made up his mind on this question "a dozen years ago," I suppose it is useless to bring forward the experiments of Petzholdt, one of those "chemists who, in a sort of desultory manner, have experimented on cement"; but for the sake of those who might possibly be misled by Mr. Reid's dictum, I will draw attention to the convincing and careful investigations, which are quoted by Dr. Knapp, Vol. II., p. 397. He tells us that Petzholdt employed samples composed of 10 grammes of caustic lime, made from Carrara marble mixed into mortars with 30 grammes each of five different kinds of sand prepared as follows: "No. 1, chemically pure silica that had been heated to redness; No. 2, quartz powder prepared from a piece of pure white rock crystal, which was quenched in water when red-hot and subsequently reduced to powder and decanted from water; No. 3 contained white sand, as is used in the kitchen for cleaning purposes—the coarser particles were first removed by a sieve and the dust by suspension in water and decantation; No. 4 contained a brown, ferruginous, decanted sand; and No. 5, the same brown sand which had been previously purified by washing with muriatic acid. Of each number three equal portions were submitted simultaneously to experiment and observed at different periods. The results were as follows.—

		No. 1	No. 2.	No. 3.	No. 4	No. 5.
Soluble silica contained per cent.	in an 8 days' trial.	0·586	0·039	0·058	0·020	0·118
	in a 5 weeks' trial.	4·40	0·60	0·66	0·31	0·25

Whence it is obvious that the soluble silica is doubled, and even increased fifteen-fold in the course of 5 weeks, and no doubt can any longer be entertained respecting the formation of a silicate of lime in the humid way during the setting of mortar." In mortar 100 years old, moreover, Petzholdt found 2·1 per cent. of soluble silica, and in similar mortar 300 years old there was 6·2 per cent. of gelatinous silica, showing how slowly the action is accomplished; but in these latter tests other influences may have aided in the reduction of the silica to the soluble condition.

Mrr Reid quite goes with me in the matter of concrete, which is encouraging. Messrs. Lascelles and Drake I will leave to speak for themselves.

Now we come finally to the unfortunate episode of the lost sack of cement, and here I must appeal for justice. I was not giving a record of experiments, but simply contrasting the behaviour of a cement with that of a sample of lime "500 years old" described by Alberti. Now, if I failed to give all the facts which Mr. Reid considers essential: "the depth of the water in the canal at the points where the accident occurred," and "the age of the sack," etc., (is Mr. Reid joking?), it was to avoid unnecessary minutiæ. If I had followed the masterly example set us in the works of Mr. Reid, I should no doubt have given analyses of the materials of the sack and of the wood of the canal-boat, and, perhaps, a diagram of the defective plank which led to the accident; but I did not want any "padding," and so inflicted only the bare circumstances on my audience. The fact of my connection with South Kensington, with which Mr. Reid concludes, is quite beside the question.—I am, &c.,

Gilbert R. Redgrave.

Muswell Hill, N., Dec. 14.

Sir,—Mr. Reid may have an interest in the manufacture of Portland cement, but he appears to forget that the architect is equally desirous to look after the quality of the bricks as he is that of the mortar; while the "jerry builder" is more likely to cheapen the cost of the more expensive material. When we get harder and better bricks, we might reasonably increase the adhesive strength of our mortar-joints; but I contend that it would be a waste of strength to use cement-mortar joints for ordinary building purposes Mr. Reid knows that the strength of a structure is that of its weakest part, and, according to this proposition, it is superfluous to demand a cement-joint or matrix which would become much harder than the component bricks. Of course, for hydraulic purposes, for walls exposed to damp, and for piors and like purposes, cement-mortar has undeniable advantages. All that was intended to be conveyed in the passage quoted by Mr. Reid is, that it would be false economy to make mortar-joints so much harder than the bricks used in ordinary building operations that the latter would decay or yield before the joints; that, in short, the aim should be to equalise, as much as possible, the two component parts of a wall.—I am, &c.,

Writer of Article.

Sir,—In reply to Mr. Lascelles' letter, I am ready and willing to supply moulded red concrete such as I exhibited and spoke of at the Architectural Association. These red concrete tiles, panels, &c., were exbibited also (with others, made by myself and workmen in 1869) at the Agricultural Hall Building Exhibition in April last, as mentioned in the catalogue thereof, and only a few yards distant from Mr. Lascelles' own exhibit. As I have made similar red concrete for a period longer than the lifetime of a patent, and to my knowledge, similar red concrete had been made by others many years previously, I am not to be deterred from making and supplying similar goods now if Mr. Lascelles or anyone else has subsequently taken patents for the same.

In stating that I have "apparently discarded" the obtainment of colour for concrete construction by the use of colouring pigments, Mr. Henry Reid has given publicity to a misapprehension. Reference to the report of remarks made and samples of red concrete exhibited at the Architectural Association, and to my letter on the subject, both published in the Building News of Dec. 10, will show that while mentioning the difficulty of obtaining reliable colouring matter, and the liability to cause unsound and inferior concrete by the admixture with the cement of colouring matter in too large proportion, I also showed that I had overcome these difficulties by the discovery of a pure and intense colouring pigment requiring to be used in very small proportion only, and giving very satisfactory results.

Mr. Reid further states that my method of developing colour and effect by removing the thin coating of cement, and thus exposing the real colours and character of the aggregate is a "somewhat dangerous and unsatisfactory proposal, for it would not and could not secure what the artistic architect desires, viz., an even and regular shade." I confess my inability to understand this sentence, and would be glad to have Mr. Reid's explanation. How could the inability to secure "an even and regular shade" (even if such were the fact, but I protest it is not) make the proposal "dangerous"?

By exposing on the surface the real aggregate of the concrete, not only is an even and regular shade, or the bright and pleasing shades of whatever stones, marbles, or granites may be selected for the aggregate, secured; but, the real danger of unsound work (caused by the usual method of finishing concrete with a thin coat of either plastered or moulded cement of different proportion and character to the aggregate, and so liable to unsoundness by differing degrees of crystallisation and of contraction) is removed.—I am, &c.,

Charles Drake.

Railway Wharf, Battersea-park, S.W., Dec. 14.

CHIPS.

The local board of Greetland adopted, last week, plans prepared by Mr. W. H. D. Horsfall, architect, of Halifax, for the drainage of the district.

The Llandaff Diocesan Church Building Society, at a meeting held on Friday, voted grants of £100 towards the erection of a new church at Roath, by Cardiff, £25 for improving the school chapel at Troedyshiew in Pentrebach, and £10 for enlarging Llantrissant school-chapel.

The town council of Truro decided, last week, to apply to the Public Works Loan Commissioners for a loan of £5,000 for the following street improvements:—Widening, &c., of Lemon-street, King-street, Factory-square, and Boscawen-street, £2,427; building a bridge at Moresk-hill, £230; improving footpaths in Richmond-hill, £1,120; and for widening Richmond-hill, £399; St. George's-road footpaths, £66, the balance of £625 being named for contingencies.

The parish-church of Horsford, near Norwich, has been reopened after partial restoration. A new open roof has been placed over nave; the seating has been rearranged, and the masonry to windows restored. Mr. R. M. Phipson, of Norwich, was the architect, and Messrs. Cornish and Gaymer, of North Walsham, were the builders; the cost has been £700.

The School-board for Brecon on Friday appointed Mr. Rhys Davies, the borough surveyor, as their architect.

Intercommunication.

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QUESTIONS.

[6330.]—**Ebonised Wood.**—I shall feel obliged if some fellow reader would give me any information on the process of ebonising wood.—Novice.

[6 31.]—**York Stone on Girder.**—Will any reader tell me the use of a course of York or other stone, before beginning the brickwork, on a girder that has to carry a wall, and oblige—York.

[6332.]—**Surveyor's Charges.**—Would some professional reader kindly say what would be a fair charge to make for surveying, making plans, and giving probable estimate of new road, to cost about £700; and what would be a fair percentage for superintending the carrying out of the contract.—Kanyaka.

[6333.]—**Gymnasium Wall.**—A gymnasium having 10in. concrete wall has developed a quantity of hair-like cracks in the outer plastering, through which the rain penetrates like a sieve, to the natural disgust of my client. What remedy, otherwise than paint, would effect a cure? I have seen a cement wash advertised, but cannot now find it. Should hesitate to recommend it without advice. —Wollefgnirts.

[6334.]—**Quantities.**—Is it correct to charge commission for quantities upon the full amount of the accepted estimate, or upon the residue of that amount after the amount for lithography and the charge for quantities has been deducted?—F.

[6335.]—**Valuations.**—I shall be glad if any of your kind readers can give me information as to the proper way to value hotel and public-house property in general, as to the particulars to be obtained, and the basis on which the value is worked out.—Z.

[6336.]—**Holes in Chapel Wall.**—In an Early English building, formerly a chapel attached to a hospital for pilgrims, are found in the wall beneath the east window, several holes, about 5in. square, and running into the wall over three feet. Two of them are about three feet from the floor, and can hardly have been putlog holes; moreover, they are inside the building. What was their probable purpose?—H. B.

[6337.]—**Half-Timber Construction.**—I shall feel obliged if any of your readers will, either from actual experience or upon good authority, kindly reply to the following:—1. What is the best method of filling in between the timbers? 2. Is there much danger of penetration of wet owing to shrinkage of timbers, or from any any other cause? If so, how is the difficulty best overcome? 3. How does this kind of construction wear? Is it liable to frequent wants of repair? 4. Are buildings so constructed likely to be in any appreciable degree colder than those built with ordinary brick walls? 5. Has this kind of construction any particular advantages beyond that of mere picturesqueness? I feel sure that many of your readers would be glad of some reliable information upon these and other matters in connection with the subject.—W.

REPLIES.

[6314.]—**Specifications for Houses.**—A good form of specification is given in Mr. Robson's "Domestic Architecture," also in "Wightwick's Hints" (Guillaume's edition), Lockwood and Co.—G. H. G.

[6315.]—**Sections.**—The method of measuring off quantities where the vertical scale is greater than the horizontal, is easy enough. Both are divided into feet and inches decimally, and both scales are read in the same manner. If "T. L. P." can read off an ordinary horizontal scale, he can read a vertical one. The divisions into tens or fractions are the same in both.—G. H. G.

[6317.]—**Value of Property.**—Consult Tarbuck's "Handbook of House Property" (Lockwood and Co.), or Wheeler's Guide, by the same publishers. Laxton's Price Book is considered a standard and reliable work on prices of artificer's work and materials.—G. H. G.

[6318.]—**Quantities.**—The employer is liable for the quantities prepared if he cancels the contract; but as the contractor is a party to it, I think he is, in law, also liable, according to the construction to be put on the ruling in the case of Moon v. Guardians of Witney Union.—G. H. G.

[6319.]—**Party-Wall.**—A bar of T-iron, with double flange downwards, and one of the flanges let into the 9in. wall, the ends of joists jammed tight against the vertical flange, will keep it immovable.—J. P., Jarrow.

[6322.]—**Damp, or What?**—The moist air of the room becomes warm when the gas is lit. This immediately condenses on the cold surface of the unabsorbent (owing to coat of oil-paint) walls. Remedy.—Offer some warmer or more porous surface to the warm moist air, such as scraping off oil paint down to clean plaster, and paper or distemper.—Condenser.

[6325.]—**Colouring Portland Cement.**—Specimens of permanently-coloured Portland cement that have stood unimpaired for many years may be seen at my address, and in buildings in various parts of the kingdom. Particulars will be gladly given to "J. H. B." if he will fix an appointment.—Charles Drake.

[6327.]—**Colouring Portland Cement.**—Brick-dust mixed with cement will give only a poor dull colour, unless mixed in too large proportion to insure sound work. "Fresco" may see samples, obtain full information, and a supply of coloured cement, that, although containing an infinitesimal quantity of colouring pigment, and so avoiding deterioration of the cement, will give a brilliant and lasting colour by making an appointment to meet me at this address.—Charles Drake, Railway Wharf, Battersea-park.

[6328.]—**Oak Shingles.**—The county of Sussex is famous for its shingling, and is much used for church spires, bay windows, &c., oak timber being grown upon most estates. The shingles should be laid on boarding and secured with oak pins. Sometimes for small works copper nails are used. The shingles should be cleft out of heart oak (not sawn), and all angles lapped, not mitred. No lead or rolls are required.—W. R. A., Uckfield.

[6329.]—**Tile Roofs.**—The head of each plain tile should have about 1½in. of mortar, and the tiling, if possible, should be pointed with hair-mortar inside. Plain tiles should never be laid in mortar, and galvanised pins are better than deal pegs.—W. R. A., Uckfield.

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CHIPS.

A cross has been placed in the north aisle of Winchester cathedral, as a memorial of the officers and soldiers of the 4th Battalion Rifle Brigade who died in the Afghanistan campaign.

A new organ at St. George's Church, Tiverton, was formally opened on Tuesday week. It has cost £300, and was built by Messrs. Hill and Sons, of Camden-road, London.

Trinity Wesleyan Chapel, East Dereham, Norfolk, was opened for worship on Wednesday week. It had been erected from the plans and under the superintendence of Mr. Edward Boardman, of Norwich, by local contractors, and the total estimated cost, including chapel, four vestries, and alterations to minister's house, is £3,400.

A new board-school was opened at Hollington, near Hastings, on Wednesday week. It has cost £1,400 for erection. Messrs. Smith was the architects, and Mr. Ashdown, also of Hastings, was the builder.

The local board of Redruth, West Cornwall, last week, instructed Mr. Silvanus W. Jenkin, C.E., of Liskeard, to prepare plans for the drainage of Redruth.

An inquiry was held at Ripley, Derbyshire, on Wednesday week, before Mr. Robert Morgan, C.E., one of the inspectors of the Local Government Board, respecting an application from the local board of Ripley for permission to borrow the sum of £4,508 for works of sewerage. No opposition was offered to the proposal, which was explained by the engineer to the local board. It was stated that the rateable value of the district was £34,500. and that loans to the amount of £27,115 had already been granted.

The Norwich school-board discussed, last week, whether to build schools for 630, 900, or 1,200 children on a site in Nelson-street, and Mr. A. H. Brown, their architect, having reported that whereas a school with accommodation for 900 children would cost £8,000, while one for 1,200 would cost £10,000, instructions were given for the preparation of plans for the largest size of school.

The local board of Sowerby-bridge opened, on Thursday, the 9th inst., 76 applications for the appointment of gas manager, the salaries asked varying from £500 per annum to £85. The list has been weeded by a committee down to five.

The Teignmouth local board received and accepted, on Tuesday, the resignation by Mr. Turner, of the office of town surveyor on account of failing health.

Mr. Wm. A. Hodgson, assistant engineer to the Tees Conservancy Board, was found dead in bed on Friday.

The Lord Chancellor, accompanied by some of the other judges and the architect, made a tour of inspection of the various buildings comprising the New Law Courts in the Strand on Saturday last.

The heritors of the parish of Crieff have resolved to proceed with the erection of a new church for the East Parish, and Mr. Ewing, architect, Glasgow, has received instructions to prepare plans and specifications for the building.

The new seed-crushing mills and oil refinery on the Boat Quay, King's Lynn, belonging to Messrs. Walker and Son, have just been opened in addition to their Albert Oil Mills by the side of the dock. The buildings cover an area of nearly 4,000 square yards, and are fitted up with the newest and best-known machinery extant. The buildings have been erected by Mr. W. H. Brown, of Lynn, from plans and under the superintendence of Messrs. Adams and Son, architects, King's Lynn and Wisbech.

The Lambeth board of guardians received, on Wednesday week, the consent of the Local Government Board to the sale of the old workhouse in Prince's-road, and thereupon gave instructions to their architect to prepare plans for the completion of the enlargement of the new workhouse so as to concentrate all the accommodation and management in one establishment.

To-day the new building of the Birmingham Medical Institute is to be opened by the Mayor. The building is from the design of Mr. F. B. Osborn, of Bennett's Hill, and is erected in red brick, with terra-cotta enrichments freely introduced, the façade being broken by a portico in red sandstone, small balconies to the upper windows, with street-brackets, giving further variety to the design. The cost is just over £6,000.

STAINED GLASS.

Bognor.—Special sermons were preached at the parish-church of St. Mary Magdalene on Sunday week, on the occasion of the unveiling of a three-light stained-glass window in the chancel. The central window is occupied by Our Lord appearing, after His resurrection, to Mary Magdalene; on the left Mary recognises her Deliverer from the evil spirits, and on the right the Saviour is saying to the same Mary "Touch me not." The work has been carried out from the designs of Mr. A. M. Blomfield, M.A., as a memorial of the late Rev. E. Edle, 50 years vicar of Bognor, whose pupil Mr. Blomfield was, by Messrs. Powell and Sons, of the Whitefriars Glass Works, London.

The Chapter-House, Lincoln Cathedral.—A scheme for filling the whole of the windows of the Chapter-house has been prepared by the Bishop Suffragan, of Nottingham, and has been partially carried out. The windows will be memorials, chiefly of members of the chapter, and will also set forth the leading events in the history of the Cathedral. The windows of the lobby will be occupied with subjects illustrating the earlier history of the diocese, and those of the Chapter-house itself with subjects extending from the removal of the bishops' see from Dorchester to Lincoln, to the present time. In each window are three oblong subjects, depicted in rich hues and relieved by large dividing spaces of grisaille, in which are shields of arms—of these shields the two uppermost tiers are charged with the bearings of the sovereigns of England, the third with those of the most noted of the bishops of Lincoln, and the fourth with those of the persons commemorated. One other window will also be filled with stained glass—the large circular one immediately over the entrance to the Chapter-house from the cloister; the subject of this will be the Descent of the Holy Ghost. Five other windows of the Chapter-house proper have already been filled with stained glass by Messrs. Clayton and Bell, of London. The two first commemorate Chancellor Massingberd, the third Canon Gilbert, of Syston, the fourth the Rev. Humphrey Waldo Sibthorp, and the fifth Dr. Mackenzie, first Bishop Suffragan of Nottingham.

Ystalyfera.—A stained-glass window has recently been erected in Trinity Church, Ystalyfera, by the inhabitants, as a tribute of respect to the late Mrs. Palmer Budd, of Yuisydared. The design and execution of the work was intrusted to Messrs. Jones and Willis, of Temple-row, Birmingham. The subject of the centre light represents Dorcas distributing her gifts. In the side-lights are female figures representing Faith and Hope. At the foot is a brass.

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WATER SUPPLY AND SANITARY MATTERS.

Cardiff.—The town council of Cardiff adopted, on Monday, a scheme prepared by Mr. John Taylor, C.E., for the purpose of supplementing the water supply of the borough sufficiently to meet the present requirements of the town. Intake culverts will be constructed at Ely, consisting of two lines of open-jointed culverts (laid in such positions as will suit the future reservoirs and filters) of a total length of 910 yards, with intermediate and connecting shafts to bring the water to a point opposite the engine buildings on the other side of the river. From thence a line of 24in. pipes will be laid for 225 yards to the present tank, which is connected with the engine wells. The cost of these pipes is estimated at £9,010, and, besides this outlay, thirteen acres of land will be purchased to provide for further extensions. The scheme now adopted is the first part of an extensive undertaking for increasing the water supply, proposed to be carried out from Mr. Taylor's plans, and estimated to cost over £100,000.

Taunton.—The water-works committee have reported to the town council of Taunton that the trial bore-hole constructed at Forche's-corner, on Blagdon-hill, has been successful in striking an abundant stream of water in the green sandstone, 80ft. below the surface. The report was adopted, and the committee were authorised to lay a 9in. main from the spring, and purchase additional land for the extension of the reservoir at Fullwood. The yield of water is about 40,000 gallons per day. A local journal declares that "It is the bare fact, however it may be explained, that all the trial shafts carried out under the advice of Mr. Easton, C.E., failed to discover any water. This ill-success led the water committee to act upon their own advice instead of the consulting engineer's, and the result is highly encouraging."

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The Lord-Lieutenant of Ireland will lay, on Monday next, the foundation stone of new buildings about to be erected by the Dublin Artisans' Dwellings' Company on the "unhealthy area" at the Coombe, recently cleared by the corporation under an Artisans' Dwellings Act scheme.

Our Office Table.

At a meeting of the Executive Committee of the Yorkshire Fine Art Society, Leeds, held last week, it was unanimously resolved to hold in the spring an Exhibition of artistic furniture, representing English times and periods. It is intended to have the lower portion of the Exhibition rooms set out for the reception of modern furniture, the various styles of which and of decorations the best furniture makers and upholsterers of the kingdom will have the opportunity of displaying in bays or rooms. The upper rooms it is proposed to devote to the accommodation of black oak furniture. This is intended to be the first of a series of special exhibitions, designed to improve the taste of the people, and familiarise them with various branches of modern and old-time art; and will be succeeded at intervals by other exhibitions, illustrative, for instance, of "Glass—ancient and modern;" "Metal-work—ancient and modern;" "Ecclesiastical Furniture and Vestments—ancient and modern," and so forth. It was also resolved that an exhibition of the works of living artists should be held in June, 1881.

The fourth Cantor lecture of the current series was delivered on Monday. Professor Church took up the subject of the history and artistic development of soft porcelain. Local supplies of the raw materials and local manufactures of allied products constituted, he said, important elements in giving to these wares their distinctive characters. But much always depended upon the traditional knowledge and experimental ingenuity of the manager or director of each factory; while the position accorded to such artistic aid as might be available had always proved of paramount importance. Professor Church first noticed the Medicean porcelain of the 16th century; the wares made at Venice and Naples, and at Alcora and Buen Retiro, in Spain, were then considered. The character of the soft paste made at St. Cloud, Mennecy, Vincennes, and Sevres was discussed, together with the effect of its composition on the glaze and colours. Among English soft bodies, the constituents of Bow, Chelsea, and Worcester ware were detailed; while some of the peculiarities of the minor factories (as Swansea, Derby, Caughly) were described.

A meeting of the members and subscribers of the Sanitary Assurance Association was held on Tuesday, December 14th, at the Langhan Hotel, to receive the Report of the Provisional Committee appointed on November 1st. Sir Joseph Fayrer presided. Mr. Mark H. Judge read the report of the Provisional Committee, which recommended the incorporation of the Association, and included a draft Memorandum of Association. The report adhered to the original intention of the Association, viz., that it desired to promote the establishment and maintenance of sanitary arrangements among all classes of the community; to grant certificates as to the sanitary condition of houses, &c., approved by its officers; and while providing the best advice and supervision, to leave the actual carrying out of the necessary improvements to such persons as the subscribers might themselves select. The first resolution was proposed by Sir Joseph Fayrer, seconded by Professor Corfield, and carried unanimously as follows:—"That the Report of the Provisional Committee be received and adopted, and that the First Executive Council be now elected, with power to have the Association incorporated in accordance with the recommendation of the Provisional Committee, with such alterations and additions as they may consider necessary." The second resolution, proposed by Mr. G. J. Romanes, and seconded by Dr. G. V. Poore, was also carried:—"That Sir Joseph Fayrer, K.C.S.I., M.D., F.R.S.; George Aitchison, F.R.I.B.A.; W. H. Corfield, M.A., M.D.; F. De Chaumont, M.D., F.R.S.; Mark H. Judge; T. Hayter Lewis, F.S.A.; H. Rutherfurd; and T. Roger Smith, F.R.I.B.A., be the First Executive Council of the Association."

The second annual conversazione of the St. Paul's Ecclesiological Society was held on Thursday, the 9th inst., at the galleries of the Society of British Artists, Suffolk-street, Pall Mall, East. About 350 ladies and gentlemen attended. The large central gallery was used as a concert-room, and an excellent programme of songs and glees was rendered by four members of the St. Paul's Cathedral choir, under the leadership of Mr. James Barnby. In the two further rooms there was a small but interesting collection of objects of art, lent by the Rev. S. W. Mayhew, Messrs. Hardman, and others. Among the principal articles exhibited were the following: a curious calvary, in glass of various colours; Venetian work of the 16th century; a wooden processional cross covered with copper gilt repoussé; and a chasuble of a singular combination of colours, supposed to have been used by Cardinal Pole. There was also a small but fine collection of modern ecclesiastical art work, lent by Messrs. Hardman.

The members of the Society of Engineers dined together on Wednesday at the Guildhall Tavern. The president, Mr. Joseph Bernays, C.E., who took the chair, was supported by Mr. Charles Horsley, president-elect; Mr. Jabez Church, and Mr. Thomas Porter, vice-presidents; Professor Glaisher, Mr. Perry F. Nursey, and others. The chairman, in proposing "Success to the Society of Engineers," congratulated the members on the progress which the society had made in numbers and in usefulness. Mr. Alfred Williams, replying, dwelt upon the advantages which the society offered to engineers, and especially the young members of the profession, by providing for the reading of papers, and by organising a series of trips to see engineering works and inventions of interest. Mr. Horsley, responding to the toast of "The President-elect," expressed a fear that, for some time at least, the society would feel the effects of that depression of the staple trades from which the country was still suffering appreciably. Many young men would feel that they could not afford to join the society, and all would have to limit their expenditure if we were successfully to compete with foreign rivals.

The Council of the Royal Institute of British Architects have notified to students that candidates for the Pugin Travelling Studentship, 1881, must send in their applications and testimonials, together with a select number of their drawings and sketches, in accordance with the terms of the Pugin Deed of Trust, on or before the 1st of January, 1881, and not later than 4 p.m. Carriage and all expenses must be paid by the candidate. The drawings, &c., will be returned to the unsuccessful candidates on application, and on the production of a formal receipt, but the Institute will not incur any expense whatever in returning them. Candidates are required to sign or initial all the drawings and sketches submitted, in order that they may be easily identified and returned to their respective owners after the election. A numbered list of the drawings submitted must be sent in with each application. Each candidate for the Pugin Travelling Studentship must send with his drawings and testimonials a *bonâ-fide* statement in writing that all the drawings he submits have been entirely made by himself. He must also send at the same time a certificate of his birth properly attested. It is also announced that the latest time for receiving at the Institute all designs, drawings, and essays, submitted in competition for the medals and other prizes to be distributed next year, is 4 p.m. on Friday, the 20th of January, 1881.

The town council of Brighton received on Wednesday a report from Mr. P. C. Lockwood, the borough surveyor, as to the use of asphalte tar-paving. He states that a total area of 6,316 square yards has been laid on the footpaths in Lewes-road, Junction-road, and across the Level, and also the cabstand opposite the Grand Parade. The system is a great improvement upon the old method of making the paths with Coombe rock and beach shingle, but it is not equal to rock-asphalte, as it is more easily affected by changes of temperature and evaporation, and it needs to be coated every year with tar and sand, and would then be very durable. The cost per square yard is but 2s., and it is, therefore, the cheapest material for paving footpaths, the average cost of other pavements being: clinker bricks, 3s. 9d.; cement, from 4s. to 5s. 6d.; Scyssel and Val de Travers asphalte, from 6s. to 8s.; and 2½in. Yorkshire stone, 9s.

The site occupied by the two old houses, with projecting shops, situate 53A to 54, Parliament-street, abutting in the rear on Cannon-row, and on the site of the Grand National Opera House, has now again been disposed of by Mr. Robins, of Waterloo-place, Pall Mall. In 1874, the property was sold by auction to Mr. Mapleson, for the purpose of forming a direct approach to the new opera house from Parliament-street; but the purchase was not completed. Its resale points to an immediate movement in connection with the site of the opera house on the Embankment; while the demolition of these old houses, whose incongruity with their more modern surroundings is very remarkable, will considerably improve the appearance of this part of Parliament-street. We understand the price now paid is equivalent to £7 per foot super.

A new clock for Lincoln Cathedral, with new quarter bells, was set going on Saturday. Sir E. Beckett, Q.C., who was consulted, recommended that the order should be entrusted to Messrs. Potts and Sons, of Leeds. The principle of the new clock is Sir E. Beckett's double-three-legged-gravity escapement. The machinery weighs about 4 tons; the driving weights about 1½ ton, suspended by steel-wire ropes 270ft. long; and the pendulum bob 2 cwt. The beat is 1½ second. In addition to the usual dial of turret clocks, there is a seconds dial. The clock is inclosed in a case, which has been executed by Mr. Allis, from the plans of Mr. Smith, clerk of works at the cathedral. The bells, which are arranged for the well-known "Cambridge-quarters," also reproduced at Westminster, are from the foundry of Messrs. Taylor, Loughborough, the founders of the new peals of St. Paul's and Worcester Cathedrals. They weigh respectively 27cwt. 2qr. 7lb., 13cwt. 0qr. 14lb., 12cwt. 3qr. 24lb., and 11cwt. 0qr. 10lb. The clock is situate in a chamber in the great central tower, and has no external dials. On the conclusion of the ceremony of opening the clock and the chimes, the Dean and Canons repaired to the west-end of the Cathedral for the purpose of laying the crowning stone of the newel of the spiral staircase of the south-western tower, thus formally signifying the completion of the difficult and anxious work in which the Chapter has been for some years engaged, under the direction of Mr. J. L. Pearson, R.A., in tying together the magnificent western façade, which was bulging outwards to an alarming extent, rebuilding the lower part of the south-west tower, which had become so rent and shattered as to threaten imminent ruin, and strengthening the whole. The stone was laid by the Dean, assisted by the clerk of the works, Mr. J. J. Smith.

A meeting of the Council of the Royal Architectural Museum was held a few days since, and the president, the Right Hon. A. J. B. Beresford Hope, M.P., took the chair. The proposal to alter the S.W. Court of the museum into a life class-room was determined upon, and will forthwith be carried out, the Ruskin and other collections of casts in this court being allowed to remain in their present place on the walls. The screens of examples of woodwork will be removed to the top gallery. These alterations are rendered necessary by the continued increase of members in the School of Art classes, held in connection with the museum, and the improvements will be carried out under the direction of the senior hon. sec., Mr. J. P. Seddon, architect. The council made their award of the sketching club, (£5 5s.) prize for the past year, and Mr. John Coates Carter was unanimously elected for the prize. Mr. Walter Hammond was awarded hon. mention, and Mr. T. Frederick Pennington's work was highly commended, but not deemed eligible for the prize, as hê had already on a former occassion been awarded the same prize. This prize, and the School of Art medal and prize distribution will be held at a meeting for the purpose on Wednesday, January 19, 1881. At a meeting of the Sketching Club, held last Wednesday evening, a second prize of two guineas was offered by Mr. Druce, to be called the "Curator's Prize," for the best series of sketches made during the session illustrative of the several periods of architectural ornament as exemplified by examples in the museum.

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The three-light east window of Kemerton Church, Gloucestershire, has been filled with stained-glass, as a memorial of Archdeacon Thorp. The subjects are: the Ascension, in the centre, and the Resurrection of Our Lord and Descent of the Holy Ghost, in the side-lights. Messrs. Clayton and Bell were the artists.

CHIPS.

New and extensive engineering works, erected for Messrs. J. Dewrance and Co., were formally opened by a dinner to the workmen in the employ of the firm on Saturday week. Messrs. Lansdown and Harris were the architects, and Messrs. Kirk and Randall were the contractors.

The select vestry of Richmond, Surrey, received on Tuesday week a report from a committee recommending the adoption of amended and reduced plans prepared by Messrs. Geo. Elkington and Son, Cannon-street, E.C., for the proposed swimming-baths. By omitting the gallery and one of the two boilers the cost would be reduced by £1,600, or to about £6,000, in addition to which there would be £1,500 required for purchase of site. Strong opposition was offered to the report on the ground that the instructions to competitors named £4,000 as the limit for works, whereas the accepted design, even as reduced, would cost half as much again; but eventually the adoption of the report was carried.

New choir-stalls, of carved oak, and other fittings in the same wood, have just been placed in the chancel of Althorpe Church, Lincolnshire. Mr. James Fowler, of Louth, was the architect.

The new buildings for Wellingborough grammar-school, erected from the designs of Mr. Talbot Brown, of that town, and illustrated in the Building News for May 21, 1880, have just been completed. The style adopted is Queen Anne, and the walls are faced with red pressed bricks and Corshill and Bath-stone dressings. The buildings accommodate 80 day scholars and 50 boarders, and include school and class-rooms, dining-hall, masters'-rooms, library and reading-room, matron's department and sick-ward, dormitories and lavatories, with baths and closets. Adjoining is the head-master's residence. The grounds are laid out as head-master's garden, large open playground, covered playground, asphalte and grass lawn-tennis courts, workshop and lathe-room, covered fives' court, gymnasium, and cricket and football-field. For the buildings, Mr. John Watkin, of Northampton, has been the contractor.

The local board of Cottingham, near Hull, received, on Wednesday week, a full report from Mr. B. G. Jacobs, surveyor, of Hull, on the works needed to complete the drainage of New Village, in which it was recommended that 1,800 yards of drains be laid, at an estimated cost of £600. The report was adopted, and Mr. Jacobs appointed to superintend the work.

National schools and a mistress's house have just been built in the village of Chettisham, Cambs. Mr. E. Swinfen Harris, of London and Stony Stratford, was the architect, and Messrs. David Porter and Son, of Southery, near Downham Market, were the builders.

Mr. J. W. Smithies, architect, of the Butts, Brentford, died suddenly on his way home from church on Sunday week. He was only 29 years of age.

Mr. W. A. Boulnois, F.R.I.B.A., and Mr. A. E. Warner, A.R.I.B.A., state, in reference to a notice inserted in our issue of Dec. 3rd, in which Mr. Stanley is named as the architect of the "Standard Life Assurance Companys'" new premises in King William-street, E.C., that Mr. Stanley is the clerk of works at the building, and that they are the architects who have designed and carried it out.

The parish-church of North Wingfield, Derbyshire, was reopened on Monday, after completion of restoration. The nave floor has been relaid, benches substituted for the old pews, a new peal of bells hung in the tower, and the chancel has also been rearranged and placed in thorough repair.

Mr. William Furnival, builder, of Wolverhampton, whilst feeding a chaff-cutting machine, on Tuesday, got his right hand entangled in the machinery, and all the fingers were cut off the hand.

The town council of Brighton have approved plans prepared by Mr. P. C. Lockwood, borough surveyor, for a proposed sanitorium, to be erected in Bear Hill-road. The estimated cost of construction is £15,000.

The Cheltenham board of guardians adopted, on Wednesday, plans prepared by Mr. Darby, their architect, for new workhouse schools for 142 children, estimated to cost £3,800, and new vagrants' ward, estimated to cost £1,200.

A report, recommending the acquirement by purchase of the local gasworks undertaking, was adopted last week by the town council of Tewkesbury.

A new coffee-tavern, to be known as the "Victoria," was opened at Englefield-green, Egham, last week. Mr. Lowe, of London and Staines, was the architect, and the contractors were Messrs. A. L. Oades and Son, of Egham.

THE BUILDING NEWS.

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LONDON, FRIDAY, DECEMBER 24, 1880.

THE PERCENTAGE SYSTEM.

ONE of the reforms necessary to place architectural practice on a more equitable footing is the alteration or modification of the existing mode of paying architects by percentage. The custom of payment by commission on outlay is one of modern origin. Even so late as the 17th century we hear of architects being paid by salary, and Sir C. Wren received a yearly salary for his work; also it is pretty certain that the custom of remunerating by a percentage on outlay arose when the architects duties became limited to strictly professional labour, and were separated from those of the builders. The contracting system led to the separation, and there is no doubt that the percentage payment was introduced as a convenient mode of assessing the architect's labour. It has been contended by some that the payment upon outlay is fair towards the employer, for they argue that the value of professional services increases in proportion as the magnitude of the work increases, that a costly building should receive the best treatment, and that the outlay incurred by an individual is a fair criterion of what he can afford to pay for professional skill. It may be worth while to inquire into the reasonableness of these claims. If it be said that the larger the outlay the greater the responsibility, we can understand the reason why the system was introduced, but as the outlay can be increased to any extent by the architect without materially adding to the magnitude or efficiency of the building, a very different conclusion may be arrived at. Again, magnitude does not usually increase the difficulties of the architect; it quite as often reduces the amount of mental labour—take, for instance, a house to cost £5,000, and a workhouse or mill to cost ten times that amount. It is equally plain that cost may be incurred without a proportionate amount of skill being exercised by the outlay-paid architect, and to say that cost is a criterion of what the employer can afford to pay for professional services, is a statement scarcely warranted by facts. The arguments that may be urged on the other side appear even more conclusive, and tend to show that both the employer as well as the skilled architect are sufferers, and the only thing that can be said for the system is that it is an easily understood and calculable scale for the public. At present the architect is not paid for his skill, but upon the cost to which he puts his employer, for, unfortunately, the expenditure in building bears no just relation to the amount of thought and labour bestowed. The effect of this system is to reduce all architects' labour to one dead level, and to create an easy means of increasing the cost of a building. Whatever adds to cost adds to the remuneration of the architect. It is hardly necessary to remind the reader that additional expense does not always mean increased efficiency; on the contrary, it bears often an indirect ratio to the skill exercised in the building. It is needless for us to illustrate this proposition by an appeal to everyday facts. When an employer engages an architect to prepare designs for a house he does so presuming that the usual commission of 5 per centum secures the services of a certain amount of skill and experience; he also presumes, like most employers of professional labour, that for increased outlay he will get a better as well as a larger house. Both these presumptions are to a certain extent ill-grounded. As regards professional skill, at present, he has no guarantee that he is employing either an experienced or an able architect; on the other hand he may have placed his wishes in the hands of a young, perhaps deserving and clever young man, who has never had a commission before, and who, however anxious to serve his client, may fail from no fault of his own to give the satisfaction looked for. Again, as regards cost, the employer has no guarantee that the expenditure of an additional £100 or £500 will be well spent, or command greater convenience, or even more of the appointments necessary to make a good or desirable residence. The money may go in increasing the size of the rooms, or in adding more costly decorations; but of actual skill exercised in carrying either of these into effect, he has no certainty whatever. But the mischief of the percentage system does not stop here. There are some members of the profession who enter it from a purely commercial aspect; they look upon the architect's employment as a very lucrative business, simply because the architect can, if he choose, "play into his own hands," and to a certain degree make his own remuneration. With men of this low *morale*, the readiest means of increasing expenditure too frequently suggest themselves—enlargement and ornamentation.

Competition in itself has mainly arisen out of the present mode of remuneration; it was clearly promoted to obtain the best result from a number of individuals who, if they had been separately employed, would have had no inducement to exhibit skill, and it may with equal fairness be said that all that is objectionable in that system of obtaining talent proceeds from the desire on the part of the public to obtain the most showy design, and on the part of the competitor to obtain the largest remuneration by percentage.

If we look on the other side to unrecognised talent, the mode of paying is extremely unfair; one architect may spend hours of thought and study in elaborating his design, while another may save himself all trouble by taking his ideas from some book, or making his building the mere replica of another; yet the remuneration is the same in either case, except that the latter has stolen a march on his brother in regard to time, and may turn out two designs to the former's one. The copyist does not quarrel with the present mode of payment, in fact, he finds it remunerative, for it pays in a fair proportion to the extent of copying effected; it is a good remuneration for quantity, but not for quality; but the artist who devotes time and thought has the undoubted grievance to urge that the more time and pains he devotes, the less he is paid. We see, then, that the present system is amply remunerative to the incompetent, but very disproportionately so to the competent architect, the unfortunate result being that both are placed on the same level, and that incapacity and inexperience are paid at the same rate as ability, making mediocrity and quantity the most remunerative elements in building.

There is even a greater injustice inflicted by the percentage remuneration, namely, that the few successful men get all the work, or a greater share of it, than they can carry out with advantage. Most of the work of the day falls into the hands of a few, and this will be always the case so long as the 5 per cent. rate is the uniform charge. When people find out that they can obtain the services of leading architects at the same rate as those of a comparatively unknown practitioner, we cannot blame them for using their discretion, though often they have not the discernment to see that by overburdening men of repute with small commissions, they are really obtaining the thought and services of those in their employ, and not of the men themselves, while they are denying to men of attainment in the profession all chances of success, who are thereby driven into competitions. We can appeal to the younger members of the profession for evidence of the injustice done by this proceeding, and to the remarks recently made at the Architectural Association by certain members, condemning the present practice of architects seeking and taking more work than they can properly supervise or carry out. At the same time architects, however greedy they may be, are not entirely to blame; like other men they are tempted to take as much as they can get, unmindful of the debt they owe to art. It is the system of remuneration which has led to the results, for, if our ablest architects could charge in the same way as eminent lawyers or physicians there would be a more equal distribution of work, and the lesser or younger men would have a better chance of winning their way to the front ranks by legitimate means.

We have seen, then, there is a temptation to the architect to increase, not to limit expenditure; that the demands made upon the architect's skill and labour are generally in an inverse proportion to the outlay or size of the building, and that, therefore, it is not fair to pay him a uniform percentage in every case; that repetitions of the same design, as in the case of a terrace of houses of similar plan and elevation, ought not to bear the same charge as a design for one house, a church, or a complicated municipal structure where the skill and time expended would be fourfold, and, lastly, that a percentage of uniform rate has a tendency to reduce architectural skill to one level, and to overburden successful men with an amount of work they cannot possibly do justice to.

The painter and sculptor both win their spurs by making their remuneration correspond to their skill and to the demand made upon it, and we can scarcely imagine either being paid for his work by the amount of canvas covered or of stone sculptured. Imagine a uniform rate of charge: where would painting and sculpture be? But the painter or sculptor cannot so well delegate his work to others. The architects only, among the hierarchy of artists, are content to depute others to carry out work for them, and for the only reason that they find that they do not reap any additional emolument for personal skill. The time has gone by when one great work was enough to satisfy the ambition of the architect; we do not live in the age of the Medici, when an artist was paid proportionately for the talent he had exercised, but it is not unreasonable that he should ask for the same recognition in this respect as the public awards to the painter, the lawyer, and the physician.

We have endeavoured to point out a few of the many evils which have arisen out of the uniform payment to the profession, as set out in the present scale, with the hope that something will be done at the next conference of architects to establish a more reasonable scale of charges. Mr. Whichcord, in his opening address this session, merely touched the question and showed the unfairness of charging the same rate for the mansion and the prison, and the injustice of making all young practitioners who subscribe to the Institute code charge the same as their more able and experienced members; but nothing was suggested to meet the difficulty. We will not now attempt to say in what precise manner the reform ought to be made, as the opinion of the profession out of doors ought to be obtained before anything is proposed; but it is evident that a graduated scale ought to be adopted, based primarily on the degree of complexity of buildings, or the skill necessary in their design and elaboration. Such a scale might be made to vary from 10 per cent. to 2½ per cent., small and difficult works being at one end of the scale, and extensive structures of the factory class at the other. It is true in the schedule of rules published by the Institute an ascending scale is spoken of: clause 4 states, "In works of small value, say, £500 in amount, 5 per cent is not remunerative, and the charge should be by time or by an ascending scale reaching 10 per cent. for works under £100"; but this clause is practically inoperative in the absence of a specific rate. Repetitions and works of a decorative character are proposed to be charged for by special circumstances, but this also is a vague manner of putting it and no settled rule is likely to be established from such a clause.

It seems further desirable that degrees of skill and experience should be recognised; that every practitioner, within reasonable limits, should be enabled to set his own value on his labour, but this is a question to be determined only by the united action of the the profession. Custom and legal sanction have given the present system a footing, but the previous endeavour to promote uniformity of charges was only tentative, while it will be universally acknowledged that neither justice nor common sense have sanctioned a mode of payment which places outlay before skill, and which clearly contradicts not only honest free trade, but the very foundation of art.

ARCHITECTURAL TAUTOLOGY.

TAUTOLOGY in art is just as offensive to the cultivated eye as tautology in speech is to the cultivated ear; and, unhappily, it is far more common. In an hour's walk through London, there is a hundred times more of it to be seen than heard. The purposeless saying of the same thing over and over again, in different words, is the vice of few: the purposeless doing of the same thing over and over again, in different forms, is the vice of many. Especially it is the vice of the careless or incompetent architect, who, while he would laugh at the man who should talk to him about an "old ancient piece of antiquity," is quite ready to show everyone, not in a momentary speech, but in a building likely to last for centuries, that his own mind is not a whit more cultured or refined than his who made this celebrated description. That it may not be thought we are exaggerating, we will leave generalities, and with some views of recent buildings before us, go into details.

The commonest form, perhaps, of the meaningless repetition in question, is found in connection with windows and door-arches. For the sake of convenience, the designer adopts square or segmental-headed sashes, and above them—as common-sense and good construction dictate—he puts a strong stone lintel or segmental arch, of the full thickness of the wall. In all reason, this should dispose of the window, so far as construction is concerned. The segmental arch or lintel is all that is wanted, seeing that it takes the whole thickness of the superstructure. But too often, either because of the foolish notion which has been reiterated for years by men who ought to know better, that there can be no good Gothic without pointed arches, or because the lintel or segmental head does not fit well into some pre-arranged composition, the designer begins again, and puts a high-pointed arch over all. Having done his work once, he pretends, apparently, to fear that it is not done well enough to last, and patches it up by the addition of something stronger. Such tricks are offensive to every one who likes to see work done in a workmanlike fashion, thoroughly and once for all. "If your stone lintel is not strong enough," such a one would say, "by all means take it away, and put a stronger; if your segmental arch is not deep enough, put another ring round it and make it deeper; but do not leave a new building patched and mended, as if it began to crumble away under your hands." The reply will be, no doubt, that the same sort of patchwork is found in some old Gothic buildings; that many fine doorways have stone lintels with arches above them, and that segmental arches under pointed ones are sometimes to be met with. This is true: but observe the vital difference between these old details and the modern ones in question. With rare exceptions (there are bunglers in all ages), the Mediæval builders did not do their work twice over, even when they used lintels under arches; whereas the modern ones often do. Look at the portal of any great French cathedral, and you will see that the great pointed arch, in recessed orders, carries alone four-fifths or more of the thickness of the wall; then comes the lintel, or the pair of lintels, to carry the remaining fifth. In old work the arch carries one part of the thickness and the stone lintel another part of the thickness; in the modern work the stone lintel first carries it all, and then the arch carries it all again. The wall is carried twice over, for no sufficient reason: and this is a case of architectural tautology.

In districts where freestone of old was scarce, and had to be rigidly economised, we may find many instances in which a wide square-headed window of many lights has a relieving arch above its square head; and sometimes the head, as well as the arch, comes to the outside of the wall. This might possibly be quoted as a parallel case to the modern ones we have condemned; but, generally speaking, it is not so in reality. The modern instances are most commonly of windows 2ft. or 3ft. wide, and the whole treatment of the buildings in which they occur shows that stone is not particularly scarce or valuable. The old examples are often of windows 6ft. or 8ft. wide, a span which few building-stones can be trusted to bridge over without failure; and the arch above the square head thus looks, and is, a necessity, and not an affectation. The same thing may be said where an arch is used above an ordinary wooden lintel. It is better, no doubt, and marks a higher class of design, to effect the object by one perfect contrivance rather than by two which assist each other; but even the latter is a very different thing from effecting the object twice over when everyone can see that once was enough. In covering a square-headed window of many lights with freestone as scarce as it used to be in Norfolk when they imported it on packhorses from Lincolnshire, one cannot readily see a more sensibly way of proceeding than to put a thin stone head to take the glass, and a strong relieving arch to carry the wall; but in dealing with a common narrow window, when stone is as plentiful as it is in London, everybody can see more sensible ways than to carry the wall first on a sufficient stone lintel, and then on a still stronger arch. The consequence is that the former is felt instinctively to be excusable and even interesting, while the latter impresses itself as being either stupid or affected.

Architectural tautology is not confined to the use of superfluous arches or lintels. We have seen corbelled piers weathered back for the express purpose of corbelling them out into piers again, when the natural course would have been to continue up the original pier without either corbelling or weathering. We have seen eaves-cornices (as far as architectural design could make them so) with other eaves cornices above them, and many other details treated in the same way. London abounds in warnings, quite as much as in examples, for the architectural student; and they may help to show him that of all the forms in which poverty of invention displays itself, architectural tautology is one of the worst.

COPYISTS AND COMPOSERS.

BY far the greater number of those who practice architecture excel as copyists rather than as composers. As with bookmakers, it is compilation, not composition, which just now is found to pay the best. It is no use denying the fact that our architecture has been simply a series of revivals with more or less of the spirit, but with a great deal more of the manner of the original styles. What we have done to infuse life and character into our buildings has been due, in spite of ourselves, to the inventions and improved manufactures and the actual requirements of those who build than anything architects have done. Look, for example, what lighting our town buildings, large covered areas, and various sanitary necessities have compelled the architect to do in planning and design; but how much more has the demands of a variety of new buildings, for commercial, civic, educational and hygienic purposes, called forth a class of buildings unknown to our ancestors. The factory and mill, the bank and exchange, the co-operative store, the vestry-hall, the museum, the school of science and art, the modern hospital and its various developments for the treatment of disease, are a few of the new problems which now call for solution and architectural treatment. These, we say, have demanded a certain amount of skill and adaptation in plan, which it would be unfair not to credit the architect with; but it would be going beyond the truth to say these new buildings have given rise to any corresponding architectural invention. It is the prevalent notion that a style is elastic enough to adapt itself to every condition, and if we admit that architecture is simply a language in which to clothe the structure, we may be contented.

It is not far to seek the reason of all this. Is it not because we are in too great haste, to do better?—that the work of the hand pays better than the work of the head?—and that books to a certain extent supersede brains? Contemporary architecture seems to divide itself into three pretty well defined classes—the works of those who copy well, of those who copy ill, and of compilers. It speaks well for the taste of our age that we have so many careful exponents of old work—men who can select with judicious taste, and copy what they see conscientiously and truthfully. The younger men of the profession turn out admirable designs, breathing much of the spirit of the old, and to this school we cannot award too high praise. Good draughtsmanship has trained their eye and hand to the pourtrayal of features and details, a success in which good illustrations have had a share; the only fault we find being that it stops short at imitation, and does not go further in the direction of inventive design. Our draughtsmen do not stay long enough to make the detail their own; they are content to catch the manner without stopping to enquire into the directing impulse of the old artist's work. A craving for change is too great to allow of a thorough study of one style before another takes its place. After all, we must be satisfied with what the discerning copyist gives us; it is far better than crude or tasteless art: there is some evidence at least that the artist knows how to select a good type of moulding or a good window or detail when he sees it, and can apply it with a fair degree of judgment and taste to the building he has in hand.

In this class we do not wish to include the "crib," who is constantly stealing and appropriating features in whole or in part from his brother-artists. Not unfrequently we find designs appropriated or plagiarised in a manner quite unworthy of the discriminating copyist, though perhaps sanctioned under the somewhat vague phrase of "eclecticism." We can only call this pilfering. There is something more to be said of the copyist who selects poor types and models: he is at least *honest*, and has the courage of his convictions. If he commits an offence against good taste, it is because he has been brought up in a school where better models have not been put before him.

There are very few who take the trouble to compose their designs, since compilation is so much more easily and quickly done. The architectural compiler picks out a bit here and another there, and the larger portion of the profession are compilers in one style or another. The only programme of course is a large stock-in-trade of designs, a number of portfolios and sketch-books, and the keen sense of this school is to hunt up all the "pretty things" and "jolly bits" they can find to make use of them when a fitting occasion arises. The compiler has this advantage over the mere copyist, that he looks at things with his eyes open. We must put him in that category described by Mr. Ruskin in his "Modern Painters" where he contrasts "seers and thinkers." That astute critic remarks "The more I think of it, I find this conclusion more impressed upon me that the greatest thing a human soul ever does in this world is to *see* something, and tell what it saw in a plain way." This dictum might well be applied to the discriminate architect as well as the artist. Our most successful men of the school we are referring to have the merit of seeing something others cannot, and of putting it before others in the plainest way they can. But the larger number of copyists cannot do this: if they select a feature, they must needs smother it up with something else, or put it in the worst possible place. They never seem to know how to tell a thing effectively. It is either overdone, exaggerated in detail, overloaded with ornament, or put in the worst possible relation with something else. Let us take a very common instance to illustrate our meaning. A bold, striking, and charmingly simple old gable is seen in Kent or Essex and transferred to the artist's sketch-book; it appears in combination with no others, and juts out boldly from the end of an old building of exceedingly plain brick or tile work. What does the restless architect do? He transfers it to a building of ten times its size or pretension, squeezes it up between others of similar or unlike design, and makes it barely project from the wall; or it is introduced in a front close to another, creating a disagreeable nook between them perhaps only of 2ft. or 3ft. Worse than all, to make them unlike, the apex of one is lopped off, or half-hipped as it is called; one is treated in brick or tile, the other remains half-timbered. There may be, and often are, two or three more gables crowded together, as dormers or projections jostling one another, and each asserting its supremacy over the others, Perhaps an elaborate timbered one may be half-hidden between two advancing gables. The effect is confusion and discord. But mark, they are all taken from good examples, and while the *ensemble* may be so bad, the details are admirable. It is unnecessary to mention other features when the artist with the best of intentions has put a good thing in the wrong place.

The difference between the copyist and the composer is greater than at first seems. The latter works to a rule or principle, which the other never attempts. All that has been said and argued against conventional rules in art, rests upon the assumption that there is tyranny in obeying a law, and those who argue thus are all the time under the more oppressive tyrany of tradition. Rosetti, an avowed pre-Raphaelist, says the "surest brand of decadence is a purblind reliance upon precedents, the crouching to authority, not in its essence and authentic meaning, but in the express form which it has assumed." The compositionist can lay a fair claim to having mastered the principles of the art; the mere copyist is content to transcribe with literal exactness and implicit belief. He designs his elevations to suit his plans, he develops any little constructional expedient into a feature of beauty, without destroying its utility; he turns into account his lighting arrangements, makes the positions of his entrances and halls external features, in short, he develops his plan, so to speak, from within outwards, instead of making elevations the leading consideration. The copyist moulds his plan to suit his favourite "bit," and in so doing loses convenience, but the true composer studies each till he has made them both express a purpose. A truthful builder invents his forms to suit a given position or object, and it is this which often produces crudeness in design; hence it happens that those of our architects who do the least copying, are often commonplace, meagre, or mechanical. A most important difference has to be noticed between the real designer and the copyist: the former begins *ab initio*, while the last commences where others have left off. He accepts results, not methods. It is on many accounts desirable that good copies prevail. Coleridge has well said that "to admire on *principle* is the only way to imitate without loss of originality." and if we could only convince the young architect that there is a deep-rooted reason for preference, that it is not a matter of fancy and inclination, we should be placing him on the right road. It is only, as Sir Joshua Reynolds says in his "Discourses," by being unacquainted with the attempts of former adventurers, that the student is apt to overrate his own abilities, "to mistake the most trivial excursions for discoveries of moment, and every coast new to him for a new-found country." On the contrary, it is possible to be overloaded and oppressed by the ideas of others. There are some designers, it must be confessed, who imagine they have done something clever, when in fact they have only succeeded in accomplishing what others had done before them, and in a better manner; on the other hand, the composer has this consolation, that he is working upon recognised principles *de novo*, and is more likely of obtaining the result he is aiming at; he can also profit by the works of his predecessors, whereas the copyist merely borrows. We might, in short, aptly quote the words of the author of the "Stones of Venice," in contravention to much that Sir Joshua Reynolds himself has said: "Never encourage imitation or copying of any kind except for the sake of preserving a record of great works." Taking a review of the modern schools, we must come to the conclusion that the thoughtful compiler is doing the most useful work by steering clear alike of pedantry and personal peculiarity.

THE PAST IN THE PRESENT.*

THIS is the title of a series of lectures on archæology, delivered by Arthur Mitchell, M.D., LL.D., Professor of Ancient History of the Royal Scottish Academy, and Secretary of the Society of Antiquaries of Scotland. The lectures form ten of the Rhind lectures on archæology, and though printed as they were delivered, will be read with much interest by those who see in archæology something more than a discursive and disconnected account of ancient objects and customs. Dr. Arthur Mitchell, in these lectures, endeavours to trace the lingering of old objects and customs in the present, and to indicate a stricter method of inquiry in archæological study than usually followed. The conclusions to which the author leads his readers have a bearing on the antiquity and condition of Primæval man, and the concluding lectures on civilisation contain speculations which, although not altogether new, will tend to clear the minds of many on what is meant by civilisation, and who have pondered over what are called prehistoric objects. Glancing over the lectures, that on the "Spindle and Whorl" has a suggestive value. The author recounts a visit he made to Fetlar, one of the Shetland group of islands, where he found the whorl still in use for spinning, and in actual process of being made, in a part of a country, too, where high civilisation exists, and where complex spinning machinery may be seen side by side with the spindle and whorl, the earliest elements of hand-spinning. In other parts this primitive mode of spinning has died out, as on the mainland of Shetland, and there remains no knowledge of the use of the spindle and whorl. The spindle rots, but the whorls (being made of stone—soapstone or steatite) are occasionally found or dug up, and are treated with superstitious care, being looked upon as charms. The lesson from this, simple as it is, is that in course of a few generations all knowledge of an object may be lost, and that a superstitious regard may be given to a mere common-place-object. From another curious incident related by the author, we also learn that it is possible for a stone whorl to be entirely forgotten by a new generation of spinners, and for an imperfect substitute to take its place; it also appears a single century may convert such a simple thing as a whorl or a stone celt into a charm or thunderbolt, directly its use is forgotten: and that as an old art dies out a process of degradation often follows. Further, the author shows by the spindle and whorl that, though an implement may be primitive and appear rude to us, it evidences more skill and contrivance than we give it credit for. The argument is illustrated by a variety of useful references. The hand-spinning of India is mentioned to show the value of this simple contrivance, and the ancient Egyptian spinners are compared with the modern Hebridean spinner, the inference being clear that the Stone-age man is not altogether so intellectually contemptible as we are sometimes led to suppose, and that primæval man was not such a degraded creature as is generally imagined. Another lecture enters into the subject of craggans, querns, norse-mills, &c., made in Barvas, in the island of Lewis. Several samples of "craggans," rude clay-made shaped vessels or globular bowls with necks, are illustrated. They are of coarse clay, unglazed, shaped by women, without a wheel, and baked in an open fireplace. Much the same moral is drawn by Dr. Mitchell, from this rude kind of pottery, coarser than many found, and supposed to belong to prehistoric times, now manufactured in a Scottish village in the 19th century. What, indeed, would be the explanation of the discovery of a woman buried with her whorl, craggans, and quern a century hence? That she lived in the 19th century, there would scarcely be any evidence, except that we might see remnants of other manufactures of a more advanced kind. The conclusion arrived at, we give in the author's own words: "(1) That the very rudest known form of an art may coexist in a nation with the highest—the Wedgewoods of Etruria with the Macleods of Barvas. (2) That it would be wrong and stupid to conclude from this that the nation must be composed partly of savages and partly of a highly-cultured and civilised people. (3) That persons capable of immediately receiving the very highest culture may practice an art just as it is practised by the most degraded savages of whom we have any knowledge." The illustrations given of querns or hand-mills, still in use in some districts, as the Hebridean islands, Shetland, &c., and the section of a Shetland norse-mill, of primitive construction, all tend to corroborate these conclusions.

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* The Past in the Present—What is Civilisation? By Arthur Mitchell, M.D., LL.D., &c. Edinburgh: David Douglas.

More interesting to the architectural antiquary is the lecture on the rude forms of dwellings still met with in Scotland. A typical specimen of the old black-house in the islands of Lewis and Harris is given. It consists of a large parallelogramic enclosure, 40ft. or 50ft. long, with two small, wing-like projections, one a sort of porch, and the other (the larger), a barn. The centre compartment is used as a byre, and a part is partitioned off for human beings by a mere curb of rough stones. The hearth, or fireplace, is in the centre, over which, from the soot-begrimed rafters, a pot is suspended; a bench of sods is on one side of the fire, a kind of seat and a three-legged stool is on the other for the use of the wife. The children and dogs crouch by the fire. The author does not remember a table, and chairs are unusual. At one end are the beds—rough, wooden posts, with straw as bedding. All sexes and ages occupy the beds; the walls are of rough stone, about 6ft. high, and about the same in thickness. The rafters are rough branches of trees, bound together with ropes of straw, and overlaid with loose thatch. The roof is not only to protect from rain, but to accumulate soot for manure; and the inside is described as "a constant cloud of peat-reek," blinding and suffocating to the stranger, though acting as an antiseptic. A plan is given of this barbarous kind of hut, seen about 20 years ago, which is not much better than a dungheap when smoke exudes from the roof; there is generally no window. The author particularly calls attention to the way the walls are built—two facings of stone, with turf between—their thickness, and particularly the want of the overlapping of the walls by the roof, so that the rain runs down into the body of the wall; he observes that this rude construction is not an expression of want of knowledge or intelligence; but the result of deliberation, as the people of Lewis are said to be physically and mentally equal to the occupants of skilfully-built houses in Canongate or Cowgate, Edinburgh. Much more degradation and savagery, he says, are to be found in the slums of great cities than in these black houses. The remarkable class of houses known as "beehive-houses," or *bothan*, is next described—hive-formed hillocks, covered with grass. One, illustrated, consists of a couple of hives, opening into each other, in which three girls cooked their food and slept. One was a store-room for milk and food, about 6ft. across, and the living-room was scarcely 6ft. high in the centre. Smoke escaped at the apex of dome; rough stones served as seats, and served also to divide the sleeping-space, covered with hay and rushes. The walls of these primitive hovels are built of rough, undressed stone, and the domical roofs are formed by making the courses overlap each other. No cement is used, and the construction resembles the oldest known masonry. Groups of these dwellings are also illustrated, and the author concludes that they represent an old form of dwelling which is now dying out. Many of them are recent. We have no space to describe any of these in detail, though they are all of similar construction. Some of them have three alcoves radiating from a central beehive chamber, and have sleeping-places in the thickness of the wall. The engraving given of a large circular one, sufficient to accommodate 40 or 50 people, and its restored elevation, is very interesting. It shows a hypogeum or subterranean gallery attached, and was no doubt the palace of an ancient chief. "Can any one assert," says the author, "that the designer may not have been potentially equal to the builder of the extremely beautiful circular church or Baptistery at Nocera dei Pagani," illustrated by Fergusson? It is certain, at any rate, that as this kind of dwelling became disused, it underwent a degradation; and this fact is borne out by Capt. Thomas and Dr. Daniel Wilson, authorities which are quoted in the text. These dwellings, at any rate, link the prehistoric to the historic man in a marvellous manner.

In Lecture IV. the caves at Wick Bay are described, and cave-life as still seen in Scotland. These dwellings are inhabited: one had 24 inmates—men, women, and children—and the author's account of a visit to it shocks one's sense of modern propriety. Men and women were found lying naked, on beds of straw, near peat fires. Two conclusions drawn from these facts are important: one is, that their habitation by a few does not prove a general use of caves, and that cave-dwellers may show a degree of degradation not exhibited by the nation of which they form a part. Among the plans given is the chambered and horned cairn in Caithness-shire, 190ft. in length, and another shorter one. Circular forms are more prevalent, and plans and section of two are given. Mr. Anderson remarks that the rude structureless cairn, inclosing a cist of slabs, is not necessarily older than more complex forms; here also the less complex structure may be the work of a later and more advanced civilisation, and it would be impossible to measure the relative degree of civilisation by comparing constructive ability. The Bronze-age cairn at Collessie, and the urns found in the cist, are given; but we pass on. Some curious and primitive agricultural implements, found in Shetland, form the subject of remark; but we are more struck with the engravings given of annular brooches, of Celtic character in the ornamentation, and made of brass and silver. Another specimen, recently made, is also shown, and suggesting a copy of an original—a good illustration, as Dr. Mitchell says, of the dying out by degradation. Lecture V. is an important attempt to show the errors fallen into by classifying antiquities according to defined epochs: as those of Stone, Bronze, and Iron; it asserts that such a classification has no absolute chronological signification; that it fails to afford criteria of culture and capacity. It is possible that a nation, for instance, should pass from the Stone into the Iron age without a knowledge of bronze. The author, throughout, brings sufficient evidence to substantiate these opinions; he shows clearly that rude stone implements are not necessarily a proof of great age. The specimens engraved from Shetland and Orkney show different kinds of dressing. After alluding to superstitions such as the belief that the stone arrow-head becomes an elf-bolt or thunderbolt, and has the power to avert misfortune, or cure disease, or the more revolting superstition that epilepsy may be cured by drinking water out of the skull of a suicide, or by tasting the blood of a murderer, the author concludes by examining the question, What is civilisation? which he briefly defines as "a complicated outcome of a war waged with Nature by man in society, to prevent her from putting into execution, in his case, her law of natural selection." In other words, the degree of civilisation attained is the measure and success of man in the struggle. Isolated man is powerless to avert that great law single-handed, so he combines and associates with his fellows in society. There is nothing new in this idea. Mr. Herbert Spencer, whom the author largely quotes, and Mr. Wallace, have formulated similar views: in fact, it is the established view of all evolutionists. An important bearing of the above theory is the view attempted to be proved that the most ancient man does not seem to have been inferior, either physically or intellectually, to the latest and most highly civilised. It is also assumed, with much truth, that the proportion of the weak and uncultured is greater in high civilisations than in low ones; we need hardly point to the weak and feeble intellects nurtured and protected by a high civilisation which, had they lived a more barbarous or natural life, would have fallen a prey to the law of selection. Another chapter asks the question—"Can the brutes be civilised?" It also discusses the unit of civilisation, and the steps by which civilisations are reached. Man alone could never reach a state of civilisation: he can only do so by uniting and associating with others, while the unit of the association is the family. No one can dispute the opinion of the author, where he shows that modern warfare, with all its refinements, is but one of the links of a savage life; war seems, as he says, to be persistent in man, whether civilised or uncivilised. In another chapter it is affirmed that civilisation can be lost, that universal progression is untenable, a proposition incontrovertibly established by Mr. Spencer in his "Sociology," as well as by the records of actual nations. "Existing men of the lowest types do not exemplify men as they originally were," writes Mr. Spencer, but probably had ancestors in higher states—a conclusion made out by facts otherwise inexplicable. It would lead us too far to follow Dr. Mitchell in this argument; suffice to remark that the means by which high civilisation works are sketched out fairly. The conventionalities of modern civilised life, marks of culture, themselves constitute a sort of tyranny under which, as the author justly says, we frequently fret, pining for the chance of a temporary escape, and in course of time civilisation may become suicidal. The author follows out Mr. Spencer's conclusions pretty closely; but we have said enough to indicate the drift of these concluding lectures, and to show that in our boasted civilisation lurks seeds of decay. Nearly half the volume is taken up with the appendix, in which quotations from Mr. Herbert Spencer's "Principles," Mr. Wallace's writings on the "Antiquity of Man," Mr. Greg's "Enigmas of Life," and other valuable sources appear. The work is well printed and got up, and the illustrations add much to the interest of the volume. We must admit that Dr. Mitchell deserves the thanks of all archæologists who desire to place the study of antiquities on a rational footing among other sciences.

LOCAL BOARD SURVEYORS AND ARCHITECTS.

IS it right for a local board officer to practise architecture or exercise control over the local architect? This is a question which every now and then forces itself upon the attention of those who watch the doings in provincial towns which are subject to building regulations, and it may, before long, call for more consideration on the part of architects. It may be as well to remember that the relation between the supervisor of a local board or municipal authority, and the independent practitioner, is not always of the most agreeable kind, and in small towns a feeling of rivalry is likely to spring up. Of course we refer more particularly to those towns in which the officer of the board or urban authority is permitted private practice. Complaints now and again reach us of overbearing on the part of officers, of unnecessary restrictions in matters of design, and of putting into operation clauses that were intended to protect the public against the speculative and "jerry" builder. The discretionary powers given to local authorities are no doubt sufficient to meet the conflicting interests that arise; but, unfortunately, the administrative machinery, frequently entangled by legal technicalities, is often incompetent to mete out even-handed justice. The original inception of the Local Government Acts was the promotion of sanitary improvements, though their extension to other statutes has not been accompanied by a corresponding development of efficiency in the executive department. To take a by no means imaginary town of say 30,000 inhabitants, a surveyor is elected to carry out the provisions of the Public Health Act. He is elected from among a number of eligible candidates, and his qualifications may be sufficient to meet all the requirements of his responsible office. Architectural qualifications are by no means those which fit him best to discharge the functions of carrying out the local improvements; in many instances they are a hindrance to his success, and perhaps the less of an architect he is the better; good business qualifications and general engineering knowledge are the principal considerations. Highly coloured testimonials are not the least esteemed proofs of competence he brings with him. He is elected, and one of the first of his duties, in all probability, is the drawing up of instructions to architects for a new town-hall, or a new set of offices, supposing, of course, he is not a competitor himself. The ability which he may bring to this task may be of the first order, or it may be the reverse; many of the instances that occur to us show a practical knowledge of requirements, and, in some instances, evidence of architectural skill. No one can object to a town surveyor advising or assisting the committee in this way; it is quite within the duties of an officer of the Board, but the independent competitor, a local practitioner, may view even this step as one not calculated to inspire him with confidence or with the justice of a publicly constituted board. But far more would he be entitled to hold this view if the surveyor were also a competing candidate, as in many cases he is, and it is this undesirable position of an officer appointed under the Local Board Acts that appears to call for redress. The records of our own journal furnish many unpleasant instances of favour shown to officers, and of acceptance of designs prepared by them; but we prefer to take a commoner case in which the board's surveyor acts in the capacity of a referee, or exercises so much control that his brother architects have little or no chance of obtaining any corporation work, whether through competition or otherwise. It will be unnecessary to mention actual cases, though two or three have recently happened which give force to these remarks. The local board of a small town on the south coast invites a competition of architects to send in designs for a new Town-hall; a premium is offered, and the expenditure fixed, and a costly set of drawings are submitted. Delay takes place, quibbles arise, and finally, the board, after paying the premium to the successful competitor, propose to expend only one-fourth of the original sum, and to employ their own surveyor. This is only one of a number of instances that might be alluded to in which a similar proceeding takes place, the injustice of which needs no comment. What we wish more especially to dwell upon is the unfair position that competition gives to a local surveyor in such circumstances both over the professional competitors and the local architects. It is unnecessary to say more than to suggest what advantage might accrue to the board's officer in such a case, for although the premium paid entitles the board to the architect's design, it very imperfectly remunerates him, unless he has the opportunity of carrying out his own design. In another actual large town, a competition for new offices was contemplated, but abandoned, owing to a majority in the town council, and the local surveyor was instructed to prepare designs for the enlargement of the old building at a cost which might have gone a long way towards erecting a building of architectural pretensions. As a result, the town has to put up with a makeshift, a piecemeal building devoid of any dignity. In the latter case, the town surveyor succeeded in securing an important addition to his salary by way of extra, but the competing members of the profession are probably none the worse off for losing an opportunity for displaying their skill.

These proceedings, however, on the part of municipal bodies are not flattering to local architects, and may be considered an unnecessary interference with the rights and qualifications of architects who have no official connection with town matters. We cannot see, indeed, the desirability or policy of adding labour of this sort to the duties of surveyors, and it may be worth the attention of the Local Government Board to introduce a clause restricting local surveyors to the duties that more particularly belong to them, as it may be the duty of the professional societies to protect those who compete for public works. The subject seems to be worth the attention of the Sanitary Institute, or of a future conference, and we have no doubt we are merely expressing the opinion of a large number of practitioners. It is not to be expected that a mixed board, composed of members who have no very clear definition of the architect's and engineer's work, can be called upon to exercise a judicious discretion in these matters. It belongs especially to the professions or their representative societies to take the initiative.

In connection with the subject of local appointments, and having an intimate relation to the independence of the professional architect, is another question which seems to belong more to the functions of the Institute; we allude to the conferring the rank of fellowship on engineers or surveyors, as well as on those who have specially made architecture and its allied arts a study. It seems hardly fair, for instance, that a local surveyor with the letters "F.R.I.B.A." tacked on to his name, should, by such an assumption of superiority, oust from the field others who have really higher claims to the title, but who are probably titleless. In small towns the effect of this combination of official with professional position is that nearly all the important work goes to the surveyor, if he is not debarred from private practice, and the professional ratepayer has a well-founded grievance against the "powers that be." This state of affairs is, moreover, somewhat aggravated by the architects of the locality having to submit drawings of proposed works (under the operation of the building bye-laws) within the jurisdiction of the board to the surveyor, who, of course, can exercise a little arbitrary power if he thinks it desirable. Necessarily all contemplated work is subject to his approval or veto, and it is not unusual to hear of complaints from local practitioners against the caprice and unprofessional conduct of the surveyor, either in impeding or otherwise taking advantage of the position. On such grounds as these the position of the local authorities and their professional advisers would be rendered more unassailable if private practice were strictly prohibited. The paltry salaries offered are little inducement for a professional man to forego this addition to his income, but the Local Government Board might very well take the matter into their consideration. Above all, it is desirable that sanitary authorities, as at present constituded, should not exercise any arbitrary powers over architectural or æsthetic questions. Some of these the institutes of architects, both of England and Ireland, have pointed out in amendments we have before discussed, and the authorities would be strengthened by limiting their powers to strictly sanitary construction.

THE EARLY DAYS OF PORTLAND CEMENT.

DURING the inquiries I had occasion to make for a recent paper on Portland cement, I was much struck with the absence there appears to be of precise information respecting the early history of this material, and the difficulty in which one is placed in determining when Portland cement of good quality was first manufactured and introduced into London. Certain of the dates connected with its production have been, it is true, very clearly established: thus, there can be no doubt that we owe the name of this cement to Joseph Aspdin, a bricklayer, of Leeds, whose patent, dated Oct. 21, 1824, has been often quoted; but I cannot find any account of the elder Aspdin's cement in the building journals, and no mention of Aspdin occurs in the works of either Pasley or Smith, the translator of Vicat.

In a German pamphlet, entitled "Erfahrungen ueber den Portland Cement," by W. A. Becker, published in 1853, I came across some interesting particulars; and I have been kindly furnished by Mr. I. C. Johnson, one of the oldest living Portland cement manufacturers, with some facts, which I think should be placed upon record. In sending you the following observations, I am actuated solely by the desire to elicit information upon this subject, before those best qualified to give it have passed away. I have been at some trouble to examine the back numbers of the *Civil Engineer and Architects' Journal*, and also of the *Builder*, the only professional papers of that day, but I find in them very little on the subject of this cement.

This much is clear, that from 1820 onwards, Roman cement, the invention of Parker, was largely used in engineering works; and that an artificial cement made of two parts of chalk and one of clay, introduced by Frost, was sold extensively at a lower price; but still, as a rival of the natural cements. Pasley, in his work on artificial cements, published in 1838, tells us that in 1837 he obtained from Messrs. Francis and Sons, for trial against his own artificial cement, some casks of their best English (natural) cement, "absurdly termed Roman cement," and also some of "Frost's artificial cement from the manufactory established by him (in 1825) and now in the possession of Messrs. White, Bazley and Son."[*] In a footnote we read, moreover, "Messrs. Francis, White, and Francis, dissolved partnership amicably on the 1st January, 1837, and separated into two firms, viz., Messrs. Francis and Sons, of Nine Elms, Vauxhall, and Messrs. Bazley White and Son, of Millbank, the latter retaining Mr. Frost's manufactory of artificial cement in Swanscombe parish, Kent."

The result of these trials, made by Pasley, proved decidedly in favour of his own cements, the natural cement made from a mixture of Harwich and Sheppey stone being second best, and Frost's artificial cement a bad third, having only 66 per cent. of the cohesive strength of the natural cement. Pasley takes objection to the mode of preparation adopted by Frost, and says he had remonstrated with his successor, Mr. White, in vain, on the plan of manufacture adopted by his firm. There is no doubt that General Pasley worked out his process for the manufacture of an artificial cement quite independently of anything that was done by the early makers of artificial cements, and the interesting record of his experiments, first published in 1830 as a pamphlet, and subsequently in a more extended form, as I have already stated, in 1838, was the means of directing great attention to this subject, both in this country and abroad. Pasley alludes, in his work, to the experiments of Messrs. Francis and Sons at their cement factory at Nine Elms, in February 14, 1838, and compares them with his own previous experiments in January of the same year, and he mentions, also, the brick and cement arch constructed by Brunel, in the Thames Tunnel-yard at Rotherhithe. This last most important trial of Roman cement is described in full, and illustrated in Vol. I. of the *Civil Engineer and Architects' Journal*, p. 119.

As a general result of his investigations, Pasley was able to conclude his preface with a prediction which has since received the most complete fulfilment, for he says: "I am persuaded that the use of cement is not only increasing in England, but that it will, in time, supersede the most approved hydraulic mortars." A translation of the work of Vicat, whose opinions on some points Pasley challenges, had been published in the previous year, and the numerous experiments I have mentioned, and the appearance of these two practical treatises upon the subject mark an important era in the manufacture and use of cements.

A second edition, of Part I. only, of Pasley's work was published in 1847, and in the preface, after referring with satisfaction to the increased favour in which artificial cements were held, he writes as follows:—"At present there are three manufactories of artificial cement in England which have all been used more or less extensively in works of importance, and have given satisfaction." He then enumerates them, and mentions the names of the manufacturers with a brief outline of their materials and processes. The firms named are: 1, Messrs. J. B. White and Sons, of Swanscomb, Kent, concerning whom he says that "after gradually relinquishing the objectionable parts of Mr. Frost's process, they have succeeded in making artificial cement which they call Portland cement, by a mixture of chalk found on their own premises with the blue clay of the Medway." 2, Messrs. Evans and Nicholson, of Manchester, whose material is called the Patent Lithic Cement; and 3, Mr. R. Greaves, of Stratford-upon-Avon, the manufacturer of Blue Lias Cement.

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[*] John Bazley White, sen., bought the estate of Frost in 1832.

In the interval which elapsed between the issue of the first and second editions of Pasley's work, the manufacture of cement had undergone a great change, and Roman cement had found its match. William Aspdin, the son of the inventor of Portland cement, had come to London and had introduced a material made of the same ingredients, and in much the same way as Frost's artificial cement, but with very different qualities, and young Aspdin appears at first to have associated himself with Messrs. Maude, Son, and Co. of Upper Ordnance Wharf, Rotherhithe. I have before me a circular, issued towards the end of 1843, kindly lent to me by Mr. I. C. Johnson, which, so far as I can learn, is one of the earliest documents on the subject of Portland cement, and which merits publication *in extenso*. The opening paragraph is as follows:—"Patent Portland Cement, manufactured by J. M. Maude, Son and Co., Upper Ordnance Wharf, Rotherithe, London. The manufacture of this cement has for many years been carried on by Mr. Aspdin, at Wakefield, in which neighbourhood, as also throughout the northern counties of England, it has been successfully and extensively used; owing to the heavy charges attending its conveyance to the London market, its consumption there has necessarily been limited, and although its superiority over cements has never been contested by those who have been induced to give it a trial, the high price at which alone it could be supplied has hitherto proved a serious impediment to its more general introduction into the metropolis. Messrs. J. M. Maude, Son, and Co. have now the satisfaction of announcing to the public that they have made arrangements with the son of the patentee for the purpose of carrying on the manufacture of this valuable cement at their extensive premises at Rotherhithe; and whilst they will thus be enabled to supply it at a considerably reduced price, they have also the satisfaction of stating that, in consequence of improvements introduced in the manufacture, it will be found, for the following reasons, infinitely superior to any cement that has hitherto been offered to the public:—

"1. Its colour so closely resembles that of the stone from which it derives its name as scarcely to be distinguishable from it.

"2. It requires neither painting nor colouring, is not subject to atmospheric influence, and will not, like other cements, vegetate, oxydate, or turn green; but will retain its original colour of Portland stone in all seasons and in all climates.

"3. It is stronger in its cementitious qualities, harder, more durable, and will take more sand than any other cement now used."

After alluding to its value as a stucco and for paving purposes, we learn "It is manufactured of two qualities, and sold in casks of 5 bushels each, weighing about 4½cwt.

"No. 1 at 3s. per bushel or 20s. 0d. per cask.
"No. 2 at 2s. 3d. ,, 16s. 3d. ,,

4s. 6d. each allowed for the casks, if returned in good condition." Then follow directions for its use, from which we find that the best quality is to be employed with four parts of sand.

We next have a series of comparative trials of this cement with Roman cement, conducted by Messrs. Grissell and Peto, at the New Houses of Parliament, in October, 1843, together with a letter from the contractors, dated York-road, Lambeth, Nov. 13, 1843, setting forth that the experiments were made by their direction and under their superintendence, to which they add, "the results, as shown in the above statement, afford very satisfactory evidences of the superior qualities of your cement."

The general conclusions warranted by the trial in question, which consisted of bricks stuck one on to another projecting from a wall, and brick beams with bearings of 3ft. and 5ft., were, that Portland with three parts sand was more than *double* the strength of Roman cement with one part sand, and that with Roman at 1s. 4d. the bushel, and Portland at 2s. 3d., there was a saving of from 1½d. to 2d. per bushel of mortar in using Portland, owing to the increased volume of sand which this cement would carry.

In the "Essay on Mortar and Cements," by Mr. J. Wylson, which took the form of a series of articles in the second volume of the *Builder*, from April to June, 1844, mention is made of Messrs. Maude's cement, together with long quotations from the above circular. Speaking of those experiments, Mr. Wylson gives the first testimony I have been able to find in the architectural press, of the value of Portland cement; he writes of it thus:—"The deductions thence arrived at show an advantage on the side of the Portland cement, which speaks most strongly in its favour; and which, judging by the authority from which these contrasts emanate, must be considered as at once authentic and conclusive; establishing this to be beyond all doubt decidedly superior to the Roman cement, whether as to strength, adhesion, or the capacity of receiving sand, the latter of which properties it is shown to possess to such a degree as to render it actually cheaper than the other, whilst its other recommendations of beauty, and the saving of colouring, alone render it highly preferable."

In the following year I find a letter in the same journal inquiring why Portland, if it was indeed a better cement than Roman, was not being used for the basins of the Trafalgar-square fountains, and Mr. James Pulham, of Hoddesdon, contributes an ingeniously worded notice of his "Portland stone cement," which, he assures the editor, has had "the test of 24 years' use." He says, of Maude's Portland cement, that it "has not been in use sufficient time to test its merits." In Oct., 1845, Messrs. J. B. White and Sons began to advertise their Portland cement in the *Builder*. In the following year some Portland cement stucco on a house in Cornhill appears to have failed or "blown," and Messrs. Maude, Jones, and Aspdin wrote from Rotherhithe, under date of Sept. 3, 1846, to deny that the cement in question was of their manufacture. In May of that year Mr. W. Tite, the vice-president of the Institute of Architects, spoke of Portland cement at a meeting of the Society as "a good material if properly made and properly applied." During this year the numerous railways, in the construction of which cement was largely employed, caused a great demand for Roman cement, for which material engineers seem to have entertained a decided preference. I find in the *Builder* for December the following paragraph:—

"The demand for cement-stone at Harwich is now so very extensive, chiefly from the large quantity of the prepared article used in railway works, that the stock, usually consisting of several thousand tons at this season, is now quite exhaused. Prices have in consequence risen 30 per cent., while the dredgers are reaping a proportionate benefit. It is calculated that £25,000 per annum are paid away in wages alone to workmen employed in this trade." It must have been about this time that Sir Robert Peel announced in Parliament his intention of taxing the cement-stone, fearing its exhaustion, and hoping thus to reserve a sufficient supply for the purposes of Government works. This fact I learn from a pamphlet on Portland cement, issued by Messrs, Aspdin, Ord, and Co., who state also that "As soon as Mr. Wm. Aspdin heard of this he addressed Sir Robert Peel upon the subject, and intimated to him that he need not be alarmed about the supply of 'Roman cement,' as an article which far surpassed it was extensively manufactured. To prove these remarks, Mr. Aspdin waited upon Sir R. Peel with samples, and obtained a reply to the effect that he was much satisfied with them, and with the explanation; and, in consequence, the proposed tax was abandoned."

Messrs. Aspdin state also, in this pamphlet, that the Wakefield cement was largely used in the Thames Tunnel about 1828, although "at that time it cost 20s. to 22s. per cask, besides the carriage to London. Yet Sir I. Brunel determined (notwithstanding his ability to procure Roman at 12s. per cask delivered on the spot) to adopt Portland chiefly for his purpose, as its merits required no other recommendation than an impartial trial."

This brings me to the date of the second appearance of Pasley's work, in which he speaks of the existence of *three* manufactories only of artificial cement, and with the evidence I have collected concerning Aspdin's invention, it appears somewhat strange that Pasley fails to refer to him in any way. I have found from the German work by Becker previously mentioned, that General Pasley had been asked to explain this by D. Garthe, of Cologne, and in *Dingler's Polytechnisches Journal*, Vol. CXXIV., the following characteristic letter from the General is published, which has not, I believe, hitherto appeared in English:—"Sir, I am much flattered by the favourable opinion you express of my work on cement. As I have ceased to occupy the post of inspector of the Royal Engineer School at Chatham, since my promotion to the rank of Major-General and have, therefore had neither assistants, materials, nor appliances at my disposal; I have not been in a position to undertake researches of a similar nature to those which were formerly carried on by me, and which resulted in the discovery of an artificial compound but little inferior to the best natural cement. For several years past I devoted no further attention to the subject until I learned that Portland cement was superior to Roman cement, and as it is the fashion in our country to disguise everything with some fantastic name or other, which, from a chemical point of view, gives not the slightest clue to the composition of the article in question, I am astonished to find that this Portland cement, the name of which would lead the foreigner, visiting our great Industrial Exhibition of last year, to believe very naturally either that it was one found in the island of Portland, or that it was related in some way or other to Portland stone, was nothing more or less than my own artificial cement compounded with chalk and clay. Messrs. Robins, Aspdin, and Co., manufacture Portland cement, which appears to me to be just as good if not better than that of Messrs. White and Sons, although I never heard of it until I met Mr. Aspdin in the Great Exhibition last year. I was present at all experiments upon Portland cement noticed in the *Builder* of the 27th Sept. last. The results of the same are rightly reported, but several of them are rendered unintelligible for want of more complete particulars or explanatory drawings.

"The foregoing are my answers to your inquiries.—12, Norfolk-crescent, London, March 3, 1852."

Mr. Becker, in a foot-note, remarks upon the singular fact that "although Joseph Aspdin, the inventor and patentee of Portland cement, established his manufactory at Wakefield in 1825, and his son Wm. Aspdin founded his works at Northfleet on the Thames, about ten miles from Chatham, a few years later,* where at that time Sir C. W. Pasley was residing, and although their Portland cement was already much employed on the continent, as introduced by Maude and Son, and subsequently by Robins, Aspdin and Co., whereas the cement of Messrs. White and Sons was not brought into the market until many years later (in 1847), Sir Charles Pasley only learned of the existence of Joseph Aspdin, the inventor of Portland cement, and of his manufactory, in the Great Exhibition in London in 1851."

The year 1848 was in every way an eventful one for the new cement, and we find numerous signs of the growing favour in which it was held. On the last day of January a fatal accident occurred at Euston station, which appears to have been due to the incautious use of cement. A lofty wall, supported on columns formed of bricks on edge, set in Roman cement, suddenly fell, causing the death of two workmen; and at the inquest which followed, and which attracted great attention, the employment of cement was discussed at great length. Mr. Hardwick, the architect, expressed an opinion that the failure of the cement was due to its employment during the cold winter weather, and to the great haste with which the work was run up. The columns in question were 20ft. high, 2ft. 2½in. in diameter at the base, and 1ft. 10½in. in diameter below the capital. Messrs. W. Cubitt and Co., the builders, stated that they could not assign a reason for the fall of the wall. On the 11th Feb., Wm. Aspdin wrote from Northfleet, and attributed the accident solely to the use of defective cement. In July of this year, the results are published in the *Builder* of some trials of Messrs. White's Portland cement, which took place at Messrs. Grissell's ironworks on the 10th and 31st Dec., 1847, and which furnish very high testimony of the superiority of this material over Roman cement. These trials, and the publicity they attained, seem to have given great offence to Aspdin and his partners; and in September a letter from him is published, as an advertisement, in the *Builder*, in which he sets forth, among other matters, that this cement was first introduced by his father in 1813, and patented as "the Portland cement" in 1824; that the original material is solely made by him, and he quotes certain tests to show that he had obtained far better results than Messrs. White, with the use of more sand. He states also that he has made blocks consisting of 1 cement to 10 of sand, and concludes by calling attention to a public trial the firm were about to institute of their cement at their wharf at Great Scotland-yard. The proposed experiments they advertised for some time, and they challenged all other cement makers to compete with them. The trials came off on the 18th Sept., and subsequently at Messrs. Bramah's on the 26th. Some blocks were crushed in the hydraulic press. A record of the experiments is given in the *Builder* of Sept. 30th, and by advertisement on Oct. 7th.

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* This is an error; Aspdin did not go to Northfleet until 1848.

The rivalry between the two firms who were first engaged in the production of Portland in the London district had the effect of keeping public attention directed to the new cement, and from this time the manufacture steadily increased in importance, while the uniformity of the quality improved. Many makers began to prepare Portland for sale, and with the year 1848 we may consider the reputation of Portland cement to have become fully established. The price of Roman cement, when first introduced, was 4s. 6d. per bushel: in 1848 it had fallen to 1s. 3d., the cost of Portland being exactly double, or 2s. 6d. per bushel.

Mr. Johnson has furnished me with some interesting facts about his own early attempts to make Portland during the year 1846, or thereabouts. He says: "I was at this time manager of the works of Messrs. White, at Swanscombe, making only the Roman cement, Keene's plaster, and Frost's cement, the latter composed of 2 chalk to 1 of Medway clay, calcined lightly, weighing 70lb. to 80lb. per bushel. My employers, attracted by the flourish of trumpets that was then being made about this new cement, desired to be makers of it, and some steps were taken to join Aspdin in the enterprise, but no agreement could be come to, especially as I advised my employers to leave the matter to me, fully believing that I could work it out." Mr. Johnson then details the efforts he made to learn the nature of Aspdin's process, and he admits that he was quite prepared, if necessary, to endeavour to gain admission to his works by any artifice in his power. He says the plan of manufacture Aspdin pursued was so mystified, that "even the workmen knew nothing," considering the virtue consisted in something Aspdin did with his own hands. Thus he had a kind of way with several compartments, and in these he had powdered sulphate of copper, powdered brimstone, and some other matters. When a layer of washed and dried slurry, and the coke had been put into the kiln, he would go in and scatter some handfuls of these powders from time to time as the loading proceeded, so the whole thing was surrounded by mystery." Mr. Johnson, foiled in getting anything out of the workmen, obtained some of the cement, and had it analysed by the best analyst of the day in London. His verdict was that the cement contained 60 per cent. of phosphate of lime. The next step was to obtain a good supply of bones; these were calcined in the open air, creating a terrible nuisance by the smell, and mixed in various proportions with the other matters shown in the analysis, but all to no good. Having learnt from chemical analysis the composition of Harwich and Sheppey cement stones, Mr. Johnson appears next to have devoted several months to attempt the composition of a cement of the colour of Portland composed of similar ingredients, and he found by using quicklime powdered and mixed with clay, and again calcined, that a near approach to what he was aiming after was attained, though still too much like Frost's cement. He next tells us, "After this I tried chalk and clay, as was used in Frost's cement, but more chalk in proportion, the resulting compound being lightly burned, swelled and cracked; by mere accident, however, some of the burned stuff was clinkered, and, as I thought, useless; for I had heard Col. Pasley say that he considered an artificial cement should feel quite warm after gauging, on putting your hand on it, and in his experiments at Chatham he threw away all clinkers formed in the burning. However, I pulverised some of the clinker and gauged it. It did not seem as if it would harden at all, and no warmth was produced. I then made mixtures* of the powdered clinkers, and powdered lightly-burned stuff; this did set, and became hard soon. On examining, some days later, the mortar made from the clinker only, I found it much harder than the mixture, and the colour was of a nice gray." The next set of experiments made by him on a larger scale failed. owing to the use of 5 parts of chalk to 1 of clay, but some of this cement which had been rejected and deposited in a tunnel, when tried some months later, was found to gauge smoothly and pleasantly and did not crack and blow-up as before, but became solid and indurated well. Mr. Johnson says, "Cogitating as to the cause of this difference, it occurred to me that there had been an excess of lime, and that this exposure in a rather damp situation had caused the excess to slake. This was another step in advance, giving me an idea of there being too much chalk; so I went on making various mixtures until I came to 5 of chalk, and two of Medway clay, and this gave a result so satisfactory that hundreds of tons were made very soon after; some of which was sent to the French Government Works at Cherbourg, and was, I believe, set up as a standard of quality to which all subsequent purveyors had to conform." Mr. Johnson points out that at this time he made use of mills, similar to the present mortar-mills, for crushing the chalk and clay, and that the mixture was then passed between millstones running horizontally, to complete the fine washing, before being run into backs. He says further "Goreham was my engine-driver, performing these operations, by which connection he got his ideas for his patent, obtained many years after. The validity of the patent might have been challenged by me, only there was this difference in our objects; mine being to perfect the fineness of the slurry, using *much* water before running into backs; his to do away with backs by using a *small quantity* of water, by which means the slurry is sufficiently thick to be pounded on to the drying stoves at once." This point is clearly put by Mr. Johnson, and explains the facts on which Mr. Goreham has secured the validity of his patent.

It will be clear, from this record of his experiments, that Mr. Johnson has strong claims to be reckoned one of the inventors of true Portland cement. After quitting Messrs. White, he set up for himself as a manufacturer of Portland, and founded the first factory on the Medway at Frindsbury, near Rochester. He then went to Cliffe, and built a cement-works; then to Gateshead, following Aspdin, who had failed; and subsequently took land at Greenhithe, and established perhaps the best-designed cement-works we have. Mr. Johnson's invention of chambers attached to the kiln, for drying the slurry by the waste gases from the burning of the cement, entitles him to be mentioned as one of those who have largely contributed to facilitate and cheapen the cost of the manufacture; and his experiences are at all times cheerfully accorded to those seeking his advice and assistance. I am glad to have this opportunity of thanking him for much help most kindly afforded me. With regard to the Aspdins, I am informed that the elder Aspdin was still carrying on the works at Wakefield, on a small scale, in 1853. The son, Wm. Aspdin, went to Germany, and died in Holstein during the Schleswig-Holstein War.

Gilbert R. Redgrave.

NOTES FROM EDINBURGH.

THE condition of the Building Trade in this city has presented during the past year some exceptionally favourable symptoms of prosperity, contrasted with reports of all but stagnation in most other districts of the country. Not at any former period, when trade was prosperous, has Edinburgh done more in the way of extending its boundaries in all directions. Schemes begun in former years have been carried vigorously on, others are projected, and in every side of the town, Merchiston excepted, the eye is arrested by the newly-rising tenement, or by alterations in existing thoroughfares. Surburban villas have been added in some number to the south, and indeed have now got so far down in this direction in the Mayfield district, that no winter shadows of the Blackford range will probably arrest their further progress. These general statements may be comprehended better in the light of the statement made lately by the City Assessor, as to the increase in the yearly valuation of the city, and which for the past civic year amounts to over £37,000.

Notwithstanding all this evidence of abundant work accomplished, the complaints of the want of it have been general throughout the year. The low rate of wages (masons getting 6d. per hour, or 6½d.) and the low price of contract work, show that these complaints are not without foundation. Encouragement has been given to speculative building, but the low prices have not given much stimulus to private enterprise here or elsewhere.

The great bulk of the work done consists of street tenements. A goodly instalment of those of the highest class may be seen in the fine opening now made from Queensferry-street to Drunsheugh Gardens. The western extremity of this part of the city has made a great stride toward completion in one side of the long shallow crescent leading to Magdala-terrace, and these houses are all sold. This is the finest Crescent in the city, or promises to be, if a liberal allowance of garden-ground has been secured.

Other tenements are mostly begun and carried on by co-operative associations. In these, the artisan is often largely interested, in some cases giving his subscription in labour, funds having been provided to commence the work on security of the building. The success of such schemes has been uniform. The desire to be honestly independent of "landlordism" and the anxieties of yearly tenure is a healthy symptom here, and to this much of the recent extensive building must be ascribed. The Tynecastle tenements, by which above 200 voters were added to the county, was a practical joke of "diamond cut diamond" which the success of co-operative building made possible and probably suggested.

The continuous increase of the higher class of houses is not so easily explained. But Edinburgh may gain in a time of long commercial depression by its attractions as a quiet haven of rest from the toils of unprofitable business. It may be taken for granted, that nowhere in Scotland can well-earned ease be taken more pleasantly than in the Modern Athens. In summer, there is the attraction of an unrivalled environment, and for all the year, a healthy and bracing air, and there are many other advantages of which not the least are the educational institutions of the city. In respect of these, Edinburgh is deservedly and increasingly popular. With exception of the far-outlying Stewarts Hospital School, every one is full. The same may be said of more private establishments. The extension of the university has not been begun a day too soon, and will not be greater than the need for it. This work has been carried forward vigorously, and the Lauriston or principal front will soon be ready for the roof. The anatomical classes are already at work within their department, and the students and tradesman are pursuing their labours side by side.

The architectural character of recent additions to the city does not present much of novelty, or call for any particular remark. The lofty street forming in Warrender Park, opposite the Links and Meadows, shows a little variation in design from the portion east of it. But this range of tenements which seems to rival "Old Edinburgh" in altitude, is not a very happy specimen of the Scottish style. The details are generally cumbrous, and the monotony of repetition is apparent. In the street running southwards, on the west, a good design has been marred in this way. The circular chateau turret had been introduced into an angle tenement; but the builder, not content with this, has marshalled it into line as a regiment all along the front of the street, destroying the beauty of a detail which is nothing without angular isolation and contrast.

A very handsome and extensive tenement for business premises has been raised in Jeffrey-street, and the Episcopal Chapel now erecting beside it all but completes the Western Division.

The retirement of the Dean of Guild this year occasioned a contest in the election of his successor, which is not usual, but was rendered necessary by the divided state of opinion as to whether or not this official should be actively engaged in the building trade. A large majority decided that he ought not. Possibly as a result of the change, the court has recently given decisions indicating a purpose of carrying out with greater stringency the sanitary provisions of the law relating to the erection of dwellings, &c. Hitherto, the court seems to have winked at compliances with the letter, which evaded the spirit of the statute. W.C.'s were placed, as before, in the heart of tenement, and the imperative communication with the open air, made only by means of a 3 or 4in. pipe led up to the roof. These as well as larger open shafts, were really as often as not, an excellent device for dispersing odours collecting in the w.c., through the house. In Leith, the court insists on every w.c. being built with an outer wall. There seems to be, now, after much discussion and some popular lecturing, a better understanding of the matter, and a movement in favour of a more radical cure by disconnection with the public sewers is getting into favour· In Portobello, the ventilation of the public sewers has been thoroughly investigated, their condition reported on by the burgh engineer, and a remedy for the defects of the system (which is by open gratings), has been recommended and will in all likelihood be adopted. This consists in the reconstruction of defective levels, with systematic flushing from tanks properly situated for the purpose.

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* Aspdin, it would seem from one of his letters, made his cement from a mixture in certain proportions of tender and hard-burned clinker.

Churches and schools make a good proportion of the yearly additions. Nine churches may be reckoned as begun, or completed, within this period. Of these, three are occupied, and others in various stages of completion. With two or three exceptions, they are all of economical construction and detail. The most costly are those erecting by the United Presbyterian church. The one in the Dalkeith-road, recently opened, is a good sample of a galleried church, and a great improvement upon any attempt that has yet been made to carry out this system in the Pointed Gothic. There is no unseemly proportion, no spire and lofty gable front in lying antithesis to everything behind it. It is a cruciform church, with nave of moderate length, and double transepts (spanned by a single arch inside), and a tower of no great height attached to each transept. The style is the modern Italian, but a quaint aspect is given to the exterior by the adoption of some details of the Lombardic Romanesque. This is carried rather far, perhaps, in the archaic and not very elegant plate piercing of the side-lights. The building has two frontages to the street, the one having the transept gables, vestry, and hall behind forming a range, very nicely put together. The front to the road is not so happy, as the gable is stripped of the support of the towers, and their place supplied by low corridor-like porches. This recession of the towers is probably a device to accommodate the gallery-stair, but it occasions a serious defect in the exit arrangements,—the area and gallery converging too closely near the exit, in a passage of no great width. In such circumstances, even a wide door is never spacious enough. A separate exit at foot of the gallery-stair might easily be provided for emergencies.

The interior is spacious and well lighted. Although the galleries are somewhat deep, there is no appearance of the overcrowding so disagreeable in small churches with continuous galleries. The organ is behind the pulpit, and the ornamental joinery is tastefully decorated in the later Romanesque or Norman style. The seating, which is in open benches, is not only cushioned on the seat, but also on the top rail, and the aspect is rather like the arrangement for a concert-room. All seats are free, which is a novelty in Presbyterian churches.

The two other U. P. churches, are not far enough advanced to enable any one to form a correct idea of them when completed. But it may be noted, that neither seem to be making any arrangement for the erection of side galleries. There is, judging, from churches recenty erected, a growing desire to have a plan which dispenses with these galleries. The introduction of the organ into all Presbyterian churches but those of the Free Church, is becoming common. A very fine one, by a London firm, costing £1,500, has been erected in St. Stephen's. These and sundry other circumstances, which might be mentioned, are indications of a change coming over the Presbyterian communions, which will be more and more apparent in the architecture, as well as the services of the church. The "idolatry of the pulpit" *i.e.*, of the preacher, with some dogmative or other crotchet, which has been happily defined as the "hair splitting" tendency of Presbyterianism, (and it might be added the "body splitting" tendency likewise), is perceptibly on the wane. People are beginning to suspect that religion does not thrive upon abstractions, even if they be the rationalism of a distant age stereotyped into a creed. Historic facts and catholic symbol are probably more effectively instructive and less provocative of contest and division. It is felt, that the devotional interests of public worship have been rather widely thrust aside to give the pulpit the pre-eminence. Congregations numbering more than 800 or 1,000 are found to be inconsistent with pastoral superintendence, unless they are collegiate charges. The architecture of the meeting house, being modelled on the doctrinal and not the devotional requirements of the congregation, nothing can raise such interiors above the secular level of the lecture hall. The attractions and advantages of galleries may be many in some respects, but they are not devotional, or indeed favourable to concentrated attention of any kind. The worshipper who is placed opposite a crowd of faces, will find himself very much in the position of Andrew Fairservice, with one eye on the Bible and the other on the bees. With this great change of feeling and the desire to keep the pulpit in its proper subordinate position, there will doubtless be a more general return to the ancient usage, by which (for all ordinary cases) the congregation is not unpleasantly divided, nor the unity of its attitude impaired.

The school-board have opened three new schools, and the Dalry school has been enlarged. A comparison unfavourable to the board had been made with Glasgow on the basis of the larger grants given to the latter for the year. To this the board have replied that a larger percentage of the city arab class is taught in their schools. Mr. McLaren, the city member, rejoins, that this can hardly be when the number of the poorer classes is so much greater in Glasgow, in proportion to those capable of affording a higher rent. But Mr. McLaren forgets that all the better class of youngsters are much better provided for in Edinburgh than in Glasgow, with cheap education by Merchant Company schools, Heriot schools, and many private establishments. The proportion therefore of city arabs to respectable boys in a class here, will necessarily be much greater than in Glasgow, where there are no such schools, and where the arabs have the advantage and larger companionship with better boys. It is also to be remembered that the schools recently opened, and which do certainly contain a large percentage of the city arab, or rough, have hardly had time to get into order, and thus the general result this year will not be any fair test of the success or efficiency of the whole system.

So rough are the scholars in their ways, that great difficulty has been found in keeping desks in good repair. Rev D. Greig, of this city, who has had much experience in fitting up these schools, has turned his attenton to the subject, and succeeded in providing a desk which has satisfied the board, inasmuch as they are putting it into the new schools and replacing others with it in the high school. The specialty of this desk lies in the casting of the heavy iron standard, and adjustment of the wood, which is all machine-made, and with the conveniences now deemed essential to the school desk,—viz., rest for the back at a proper angle, good broad seat, and shelf for books. This desk has deep flap, which falls down simply to let the pupil stand up or move out. It is 2ft. 3in. in depth, requiring only 2ft. 4in. of floor depth, and made in the dual length, it is about 3s. less costly than any other which can be had in Edinburgh.

THE ARCHITECTURAL TREATMENT OF SMALL STAIRCASES.*

In reading a paper before you on small staircases, I must ask your forbearance if I appear to treat the subject in too elementary a manner, and almost necessarily note some axioms which will be already familiar to many of you; but as our Association is specially intended for the use of students (of whom a large number join us each year) I hope there may be something useful in these jottings, and the recapitulation even of facts will sometimes lead us to think and develop fresh ideas for ourselves.

There is no house so small or unpretending but that the staircase offers an opportunity of architectural treatment, and by a little care and good arrangement, and without adding to the cost, may give a suggestion of artistic feeling, and break the spell of that oppressive monotony which is the curse of so much of the general small house architecture of the present day. The difference also between a well and badly planned house often lies in the staircase, and nothing is more common than to hear it said: "I should take such or such a house, but for the awkward stairs, or the steep or dangerous stairs." Our client's property may therefore be seriously damaged in point of value by any omission on our part to arrive at the best staircase the circumstances will permit.

One more word before entering on my subject, namely, that I have purposely steered clear, as far as possible, of style and design in detail, believing that *style*, after all, is only the language in which an artist's thoughts are expressed, and the same beauty and feeling may be seen and felt, treated in various styles, just as ideas may be conveyed in various languages, though one style or language may often be better suited and more appropriate than another to express those ideas.

The subject naturally divides itself into three divisions:—1st, the position; 2nd, the arrangement; 3rd, the details of a staircase in a small house.

1st.—*The position of the staircase in relation to the house.* This may be external or internal, but as I propose to deal more especially with staircases suitable to small houses in this country, in the latter part of the nineteenth century, external staircases need not long engage our attention. No notice, however, of small staircases could be deemed complete without mention of a few of these. Most of the remains of old English houses up to the close of the thirteenth century show signs of external staircases leading to living rooms on the first-floor, and which were also usually approached by a second staircase from the great hall, which up to that date was generally the full height of the house. The very beautiful external Norman staircase to the buildings attached to the Cathedral at Canterbury is well known, but Italy par excellence is famous for these features great and small. A very well-known one, and illustrated in our Association Sketch Book, is one at Spoleto. I have an example here less known, which I came across at Taormina, in Sicily, and which, though attached to a small cottage, has all the elements of a very picturesque treatment. The stair is in two flights, the lower one being in this instance entered from the ground-floor room and not from the outside, the upper being carried on an arch, a common treatment, and here forming a porch, with a stone vaulted roof in place of the existing wooden one, a very charming effect could be obtained.

The position of a staircase in relation to the internal arrangements of a house is a very interesting and important question. Professor Kerr, in his book on the "Arrangements of a Gentleman's House," says "A staircase ought to be so placed as to afford direct passage for the ladies particularly from the public-rooms to the bed-rooms." Mr. Stephenson says, "No rule as to the position can be laid down. It is usually in a conspicuous position; but when the hall is used as a sitting-room, it is better adapted for the purpose if the stair is shut off from it, at least by an open screen." Now the position of the staircase is so radical a factor in the planning of a house, that it is very important that we should have a clear and right view as to what is desired by those who are to occupy the house. Mr. Stephenson says "it must vary in each house," and no doubt it will to some extent, though the principle aimed at will probably be the same. The same author says it is usually in a conspicuous position, also the fact, as we all know; but the question then comes in as to whether, in our present habits of life, this is desirable or not. Let us look back for a moment to the planning of our old English houses, for though our habits are much changed, and what has been can never be again, there is generally something to be learnt either to follow or or avoid, and it helps to show the growth and principle on which our intricate plans of the present day are based. We shall find that up to the time of Queen Elisabeth, the houses were more or less fortified, and the staircases of stone placed principally in turrets, an arrangement not likely again to come into general use, though at West Deane Rectory as early as the end of the thirteenth century, a newel staircase is still to be seen—placed, as will be found almost invariably the case, in a corner, and occupying no conspicuous position, though its existence was duly emphasised on the elevation. During the timo of Queeen Elizabeth, however, newel staircases came largely into use with their straight flights and square landings, and during this time some of the finest staircases we have were put up, and many of our most thoroughly English houses were erected, the arrangement being distinctly to make the hall an apartment for general use, with the stairs leading merely from some retired corner to the rooms above, in most cases being absolutely concealed by a door; and Palladio, in his description of staircases, assumes as a matter of course that it will be so enclosed, but advising that the door should be in a conspicuous position, and in the best part of the house. The sketch plan of Hailey Hall, No. 2, shows one method of screening the stairs off the hall, in a very usual manner.

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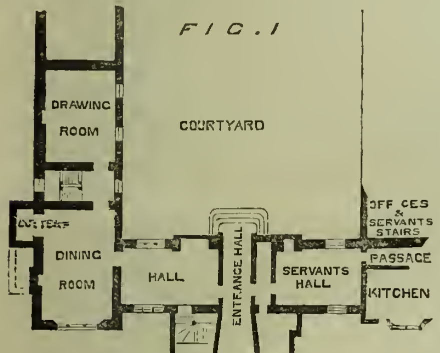
* A paper read by Aston Webb, A.R.I.B.A., before the Architectural Association, on Friday, December 17, 1880. See p. 774.

Sometimes we find the stairs placed just off the hall in a lobby between the hall and one of the living rooms, as at Wrotham-place, No 3, or even still further away, as at Severn-end, Worcestershire, No. 4 (Fig. 1 of accompanying illustrations). This house, by the way, is shown to visitors, and though very little known, is well worth a visit. In all these cases there is a separate staircase for servants, and the usual plan shows the hall dividing the family apartments from the servants, and connected over by the gallery. This arrangement assumed of course that all the reception-rooms were on ground-floor, and the stairs led only to private rooms, and were therefore planned as private as possible. No. 18 is a plan of a house recently published in the Building News, in which the architect, Mr. John Douglas, of Chester, appears to me to have adapted most successfully this type of old English planning, to the requirements of the present day; with a large hall the whole depth of the house, and the staircase conveniently cut off and placed in a portion of the building by itself. Mr. Prinsep's house, No. 17, also illustrated lately in the Building News, is another good illustration of this position for the staircase. In larger Elizabethen houses, some of the principal rooms began to be placed on the first floor; here the staircase naturally became grander, but were on a scale beyond the limits of this paper. After this date, the Italian model came into vogue, where the staircase was placed in a central hall or cortile, or immediately leading off it, and this plan, with more or less modification, has continued to be largely adopted down to the present day. One cannot think of a suburb of London, or indeed any other large town, without its quota of *Italian Villas.* Fancy Italian Villas in this cold, muggy, fuggy, and anything but Italian climate of ours (but this by the way). The Italian plan also often required the reception-rooms on a first-floor, and therefore led to a grander staircase. The demand in the present day, where the space can possibly be obtained, is decidedly in favour of all the reception-rooms being placed on the ground-floor, when the staircase should therefore, as I consider, return to a less conspicuous position, its only object being to afford access to bedrooms. The question, therefore, has to be considered as to the best position of the stairs, in a modern house, taking note of what has been done before, but not copying it, without regard to the altered requirements of to-day. What I wish to lay before you, is that privacy rather than conspicuity, is to be aimed at in a staircase of a house of ordinary dimensions leading to bedrooms, and that with the reception-rooms, on the ground-floor the staircase is put to no use but private and domestic ones, and that where this privacy is observed, it is of advantage to all who use it, and more especially to the ladies of the household. You probably all know tho story of the amateur architect, who designed his own house, his great idea being a large central hall and staircase, with a gallery round, on the first-floor, off which all the bedrooms opened; the consequence being when any occupant of these rooms went for a bath in the morning they were seen by the servants downstairs; and later on, when the servants were removing the slops from the rooms, they were, in their turn, seen by the guests and others from the hall below. Many plans have been designed obtaining this privacy, and this plan of Hailey Hall No. 2, shows one means, though owing to increased height of modern rooms, the space occupied must of necessity be considerably increased, but this arrangement, if the stairs are screened off from tho hall, is capable of infinitely picturesque and homely treatment, and what we want in small houses, above all things, is a homely treatment; it will necessarily vary in every plan, but the principal requirements to be aimed at will be the same.

FIG. 1

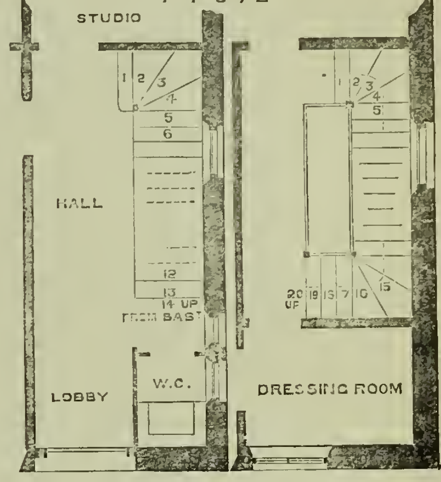


The hall-and-staircase arrangement, a very common one, such as shown on plan No. 5, appears to me both wasteful and inconvenient. The staircase spoils the hall, and the hall spoils the staircase; that is to say, the hall is of no other purpose than for effect and show, it being impossible to use it as a sitting-room, and in my view, the stairs, being placed in the hall or general thoroughfare, are too public for the purposes they are intended. Another great objection also to this arrangement is, that the hall has to be lighted from above only, and the proper ventilation of it becomes a matter of great difficulty, if not absolute impossibility. You will understand that I am speaking strictly of small staircases, that is, such as you will find in gentlemen's houses generally, and these remarks do not apply to houses where a portion of the building is occupied by State apartments, and where, therefore, a larger hall and staircase may be necessary for architectural propriety and befit the apartments to which they lead. Of late years, on the other hand, the demand for cheap houses with large accommodation has led to an undue reduction in some cases in the size of the hall, where, in fact, you enter the front door, and the stairs are at your feet, and an array of little doors all round you, too suggestive of cheeseparing to be pleasant or desirable. My own idea for a country-house is a vestibule, with passage from same to servants' department as means of access for waiting at the door. The vestibule to lead into a hall, with a fireplace, of course, carpeted and furnished with comfortable chairs and side-tables, and with the staircase screened off from one corner of it. In town-houses and restricted sites, the *position* of the staircase is hardly a matter of choice, and must necessarily come in the hall; but the same idea of privacy can be aimed at here also; but this brings me more properly to my second heading the *Arrangement of the Staircase.*

2nd. By arrangement, I mean the number of flights, the landings, and their disposition. And here privacy should again be aimed at, privacy, that is to say, from strangers coming to the entrance-door, and the simplest way of obtaining this is by reversing the flights so that you go *up* in the direction of the door rather than come down opposite to it as is the common rule, the practice of making the staircase rise immediately opposite the entrance-door being objectionable. I have usually turned the stairs round the other way myself, and the only objection I have ever had raised was in the case of one of a pair of semi-detached houses, where the tenant told me his wife's friends "chaffed" her about the staircase being turned round the *wrong way*, and supposed it was because she was ashamed of her stair-carpets, and this opportunity for the display of the stair-carpet seems to be really one of the reasons for the common arrangement. On the other hand, I have more frequently found that tenants soon appreciated the advantages of the arrangement. In a town house, indeed, this seems absolutely the only relief from the stereotyped plan, shown on drawing No. 7 and known to you all, with the dreary stretch of kamptulicon in fancied imitation of marble inlay or tiles, and the said stair-carpet rising steeply up in front of you as you enter.

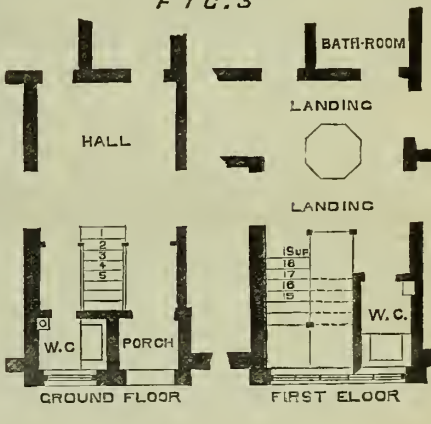
There is one other plan of placing the staircase, in the centre of the house between the front and back rooms, but this involves top lighting, and means semi-darkness on the ground-floor, and is not desirable. The most economical arrangement, in my opinion, where the frontage is sufficiently wide, is to bring the staircase forward, as shown on plan No. 6, or where the houses are semi-detached still better, as shown on plan No. 8 (Fig. 2 of illustrations). Both these arrangements require that the look-out at the back should be fairly good; otherwise the additional

FIG. 2



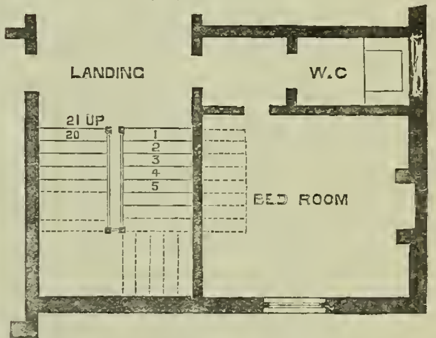
GROUND FLOOR FIRST FLOOR

FIG. 3

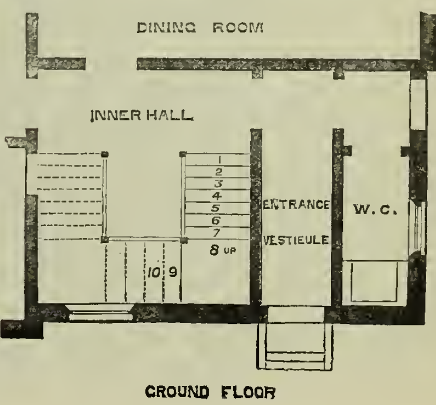


GROUND FLOOR FIRST FLOOR

FIG. 4



FIRST FLOOR



GROUND FLOOR

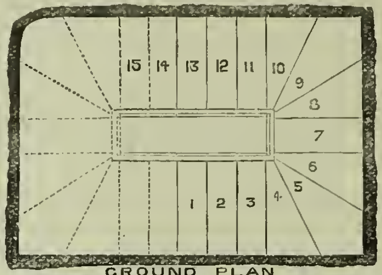
space obtained is hardly of much value, though it is something to have got rid of the long entrance-passage already referred to.

The principal objection is that if the w.c. be placed under the stairs, as it must almost always be in narrow-frontage houses, it brings it very near the door and the window in the front elevation; but with a freer treatment of street architecture, and by arranging the entrance to w.c. to open on to the basement stairs landing, instead of direct into the hall, this objection is much modified. Another objection taken by some is, that you enter from the street *under* the stairs, which is true; but by forming the portion under the landing into a vestibule, which may be arched or domed, this is screened, and its reduced height rather gives dignity to the inner hall by the contrast.

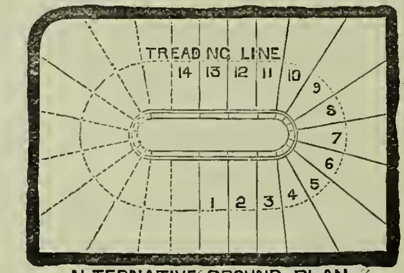
No doubt a preferable arrangement is that shown on plans Nos. 9 and 10 (see Figs. 3 and 4) where the entrance is by the *side* of the staircase, but distinct from it, thus giving the full height to the entrance; but this can only be obtained where the frontage is larger than is usually the case in town houses. Another arrangement, and one I have found to work well where a town house has to be altered, is shown on plan No. 11. In this case, a new dining-room was built in the yard in the rear. The dining-room in the front was converted into the library, and the library was thrown into hall, and the stairs placed in it. This gives an idea of spaciousness not easily obtained in a town house, and is well lighted by means of the court between stairs and dining-room. A favourite arrangement in Queen Anne houses, where the stairs have to be arranged in the entrance opposite the door, is to turn the last four steps at right angles to staircase, as shown on plan No. 20. This breaks the straight ladder-like flight in front of the door, but requires a wider hall than can usually be obtained. Having settled the position of the staircase in regard to the house, and the point on the ground-floor most convenient to rise from, the next question is the arrangement of the flights and landings. The first point to be kept in view being, of course, the main landing on the first floor, the object to be aimed at is to place this landing so that all the rooms on this floor open on to it without in small houses, such as we are speaking of, any corridors or passages. In a skilful plan, there may be a good roomy entrance-hall on the ground-floor, where it is of use, and a very economically-disposed first-floor landing, though with the central top-lighted hall and staircase already mentioned, this is not possible. Plan No. 12 shows this, as also plan No. 10, in both which cases there is ample entrance-hall, but very economical first-floor landing. Another advantage of Plan No. 12 may be mentioned, though only indirectly connected with the subject, viz., the way in which the w.c.'s are arranged on each floor against the outer walls, and without one of their four sides abutting on a any living or bedroom.

Everyone knows that long straight flights are to be avoided, eleven treads being about the extreme number in one flight, and also that square landings are desirable, though these should only be used sparingly, for too many square landings and short flights are more tiring and cumbersome, even, than over-long flights; but where square landings or quarter-spaces are impossible, winders have to be introduced, and these need not necessarily interfere with the comfort of the stairs. There are winders, *and* winders, and everything depends on the way in which these are arranged. It is common to find most writers on this subject give a wholesale condemnation to winders, and to speak of them as makeshifts hardly to be tolerated. The most usual way is to form the square quarter-space, and then cut it up into three treads, by the easy process of an angle set square of 30 and 60 degrees; this involves that the treads partake each of a triangular form, terminating in a point, and are as dangerous and prolific of accident as can be, even though the treading-line, which is about 18in. from the handrail, may be equal througout. Plan No. 13 (Fig. 5) is a choice example of this arrangement. I do not know whether you recognise it; it is an example very well known as leading from this entrance-hall up to "the only lending-library in the profession"; it has a peculiar "refinement," in the width of the tread between the winders being 12in., instead of 10in., like the others, and this, coming between the very narrow winders, makes it singularly awkward; but you can all judge by experience whether it is easy "going" or not. Now, with a well-hole of 12in., as this has, it would surely be better to divide this among the winders than to give it to the one central step, and if arranged as shown on the plan below, the "going" would have been comparatively good, for the rise and tread are easy in themselves; it is only the arrangement of the winders that makes it otherwise. On plan No. 14 is the staircase figured in Viollet-le-Duc's "How to Build a House." Here he was fettered by no conditions, but optionally shows a stair with winders—a very general practice in France.

FIG, 5



GROUND PLAN



ALTERNATIVE GROUND PLAN

The staircase at Mr. Prinsep's house, already referred to, is mentioned as having particularly easy "going," and yet it is largely composed of winders. Note that in both these examples the winders are not confined to the treads on the quarter spaces, but commence some way down the flight, thus making the wind less sudden and therefore easier. The small landings on M. Viollet-le-Duc's example certainly seem small, and rather likely to break the ease of the stair. Another very good example, No. 15, of a staircase, practically composed entirely of winders, has very kindly been lent to me by Mr. Lawrence Harvey, by whom it was recently designed for a house in Queen Anne's Gate. I have been up it, and can testify to its comfort. In this case a very awkward-shaped space had to be appropriated for the staircase, and a rectangular arrangement was out of the question. The outer string is here laid down concentric with the enclosing walls, the treads are then spaced out equidistant on the treading line 18in. from the outer string, and the radiating lines of the risers are then drawn in by eye. This is checked by developing the string and laying the treads and risers upon it, when they will probably be found to rise very unevenly, and this must be corrected until a gradual rise is obtained, and the points are then taken off from the developed string and marked on the plan. The result is a peculiarly easy rise, and to those accustomed to use a stair designed on these lines the body soon acquires and falls into the swing or curve, which becomes really pleasanter than a square stair. I have dwelt on this question of winders somewhat at length, as our practice in England is contrary to that more generally adopted on the Continent, and, I think, inferior. The objection to it certainly is an absence of landings for the aged and infirm to rest during the ascent, but I doubt whether they cannot stop almost equally well on any part of the stair as on a quarter-space landing, and unless the rooms are very lofty, the question really seldom arises at all.

A continuous handrail with this arrangement is of course necessary, and this of itself helps to lead one in the direction of the stair. Another very important point to be remembered in the designing of the staircase is that it naturally acts as an upcast-shaft to the house, and is, as it should be, its great ventilator. It is very essential, therefore, that it should have at least one outside wall with windows for ventilation; without this a house is always liable to a close and stuffy smell, and it must be remembered that where a w.c. or kitchen stairs are placed, as is often the case, under the principal stairs, special care must be taken, or the least smell from either will at once pervade the whole of the house; and on this account it is desirable, as Professor Kerr has pointed out, that the dinner-service should not pass through the hall if it can possibly be avoided. The aspect of the staircase windows can hardly be considered, as the stairs will naturally be placed where the aspect is least suitable for rooms; if you can get a sunny aspect however, it is preferable; indeed, one would like to get sun everywhere, and sun in the hall and staircase gives a very cheerful impression to the house. Stained glass is very legitimately used in staircase windows, but it is desirable there should be some clear glass where the outlook will allow it, to see the sky, or otherwise you are apt to give the impression that you look into a court or some other undesirable outlook. The landings of a staircase, where space will permit, should be wider than the stairs themselves in order to allow of a stand of flowers or some china jars, or of a window-seat, which really would offer rest to the old and infirm using the stairs. The picturesque effects to be obtained in this way are endless.

3rd. And now a few words may be said in connection with the *Details of a Staircase.* The rule for the proportion of treads and risers need hardly be mentioned, beyond saying that the aggregate of the tread and riser should always be about the same. Thus take 17in. to be the recognised standard, then a riser of 7in. would require a tread of 10, a rise of 6in. one of 11, and so on.

With regard to the width this should never be less than 3ft. in the clear, and if any of the reception-rooms are on the first floor, the stairs should not be less than 4ft. wide in the clear. Staircases in modern houses may be generally divided into those with well-holes, and those without; the former are either newel staircases in which the handrails stop against the newels, or else have a continuous handrail—probably the most dangerous arrangement where children are concerned, affording every facility for sliding down them, and tippling over; where the rake becomes steeper; stairs without well-holes are either dog-legged staircases, or of the character shown in the example from Viollet-le-Duc, and these are generally used where space is limited.

For internal domestic staircases, wood is undoubtedly the best material. Stone may be used for the principal flight, its advantage being the quiet which is obtained. But it is far more tiring and irksome to those frequently using it, such as servants, and the same effect may be obtained by the use of solid wood steps, which at the same time have far more spring in them, and are, therefore, not so tiring. In Italy, and warmer climates than ours, stone staircases seem more appropriate. I have a very interesting one here, from Lecci, in the South of Italy, shown in a charming drawing, very kindly made for me by Mr. Sidney Vacher.

The soffit of wood stairs is usually plastered, but the material is not really suitable, as the spring, which a good staircase should have, to a slight extent, sooner or later cracks it at the junction of the flights with the landings. A deal panelled soffit would add but little to the cost, and would, at the same time, give character to the stair. The inclosure of the stairs by handrail and balusters needs no remark, beyond the fact that 2in. balusters will always look better than 1in., and that 3 to a step, as they used to be, is immeasurably superior to the two poor little inch balusters generally seen. If only two are used, they should be of such a substance that there is not more than their own thickness between them. The wreathed mahogany handrail, with its elaborate scroll on the ground-floor, is very expensive, and should be perpetrated no longer; it has called forth many elaborate treatises on its setting out, and many staircase hands have made its perfection the aim of their lives; but beyond this there is little reason for adhering to it, except in the case where winders are introduced, as in No. 15, where it becomes a necessity. A close or open string is very much a matter of taste and design, though perhaps the balance is in favour of an open string, and ladies will certainly be found generally to favour it, as having less corners difficult to sweep than a close one. A staircase should always look solid, with no stint of material, and while elaborate workmanship would be out of place on a small staircase such as I am speaking of, care should be taken that all the mouldings should be full and rather more massive than those in any other part of the house. The ladder look of many stairs is, above all things, to be avoided. An old oak staircase, which has weathered almost black, with its heavy newels, handrail, and balusters, its solid oak steps, covered in the centre with a white drugget, has a quiet, homely and inviting look, very different to the general toilsome-looking and uninviting ladders of the present day. With regard to its decoration little need be said except, probably the less, the better. It is needless now to inveigh against the block-marble-paper, as architects, at any rate, have given up its use. A wooden panelled dado, or a plain, varnished and painted one, with a severe pattern paper, of not too dark a colour, is all that is required. Cornices on the landings are better omitted; but if a panelled soffit is adopted, a small cornice would probably finish this, and run round the landings also. Generally we may say, plain, honest, good construction is all that is required in a staircase. Ornamentation likely to arrest the attention is out of place; the same applying to the carpet, which should be quiet and unobtrusive in design, and indeed, if you are so fortunate as to be able to make the stairs of solid oak, nothing looks better on these than a clean white drugget.

Gentlemen, I selected this subject when asked to read a paper before you, thinking it must be interesting to all engaged in the study and practice of architecture, affecting so nearly as it does the comfort and interests of our clients.

METROPOLITAN BOARD OF WORKS.

At the meeting of this board held on Friday, the election took place of district surveyors for the two districts into which Brixton and Streatham has been subdivided, viz., East Streatham and Brixton and West Streatham. The returns published by the board show that the annual gross return of fees for the district now divided has of late averaged £750, a low sum as compared with the average of these offices. Thirty candidates, whose ages varied from 28 to 46, offered themselves for either appointment. The election was upon the exhaustive principle, six candidates being chosen by a preliminary vote, and the lowest being dropped at each successive voting. The following lists show the details of voting, the half-dozen left by the first vote being distinguished by a dagger, and those successively dropped by an asterisk. The election for the Eastern District was taken first, thus:— † Quilter, J. S., 32; † Dale, D. R., 23; † Carritt, E., 22; † Stenning, A. R., 21; † Ashbridge, A., 19; † Conder, A., 19; † Todd, F., 19; Notley, F. C., 18; Elkington, George, jun., 17; Large, W. A., 17; Street, E., 17; Bridgman, H. H., 15; Hewett, E. R., 14; Smallpeice, W., 13; Brooks, C. W., 12; Hunter, P., 12; James, James W., 12; Lees, W. H., 12; Scrimgour, W. H., 11; Karslake, L., 10; Pownall, R. E., 10; McLachlan, H., 9; Mundy, J. E., 9; Edneston, J. S., 7; Grellier, W., 7; Stone, F., 5; Taylor, A. T., 5; Ferguson, J. M., 4; Stone, T., 3; and Buxton, W. J., 1. (In deciding tie for two lowest places: Conder, 21; Todd, 20; *Ashbridge, 12.) Second vote:—Quilter, 30; Dale, 20; Todd, 19; Carritt, 18; Conder, 11; Stenning, 11. (Tie, Conder, 18; * Stenning, 12.) Third vote: Quilter, 22; Dale, 21; Carritt, 20: Todd, 15; *Conder, 8. Fourth vote: Quilter, 25; Dale, 21; Carritt, 15; *Todd, 13. Fifth vote: Quilter, 26; Dale, 20; *Carritt, 15. Final vote: Quilter, 25; *Dale, 13. Mr. Quilter, who was then unanimously elected, has for a considerable period acted as deputy-surveyor of the entire district for the late Mr. Mullins, and was President of the Architectural Association during the session 1875-6.

The election for West Streatham was then proceeded with as follows:—Preliminary vote: †Todd, 26; † Dale, 25; † Carritt, 24; † Large, 21; † Hewitt, 20; † Notley, 16; Brooks, 15; Conder, 15; Stenning, 15; Street, 15; Bridgman, 14; Elkington, jun., 14; Smallpeice, 14; Ashbridge, 13; Hunter, 13; Scrimgour, 13; Pownall, 10; Lees, 9; Munday, 9; James, 8; Grellier, 7; Ferguson, 6; Karslake, 6; McLachlan, 6; Taylor, 6; Edmeston, 5; Stone, F., 5; Stone, T., 2; Buxton, 0. Second vote: Dale, 23; Large, 20; Todd, 18; Carritt, 15; Notley, 10; *Hewitt, 7. Third vote: Dale, 23; Todd, 19; Large, 17; Carritt, 15; *Notley, 7. Fourth vote: Dale, 25; Large, 18; Todd, 17; *Carritt, 14. Fifth vote: Dale, 26; Todd, 18; * Large, 14. Final vote: Dale, elected by 26 votes; Todd, 10.

A new committee of 16 members was appointed under the Thames River Prevention of Floods Act, 1879, to hear parties who may object to the board's requirements, and generally to carry out the provisions of the Act. The Plumstead District Board having called attention to floodings in that district in consequence of heavy rainfall, and suggested the construction of overflow culverts from the main sewer in the Lower Woolwich-road to the river Thames, the clerk was instructed to inform the district board that the whole question of relieving the sewers in times of heavy rainfall had been under the consideration of the board for some time past; and also that the Board were advised by their engineer that the works suggested by the district board would not meet the requirements of this case, inasmuch as the lower floors of the houses to which they referred were considerably lower than high water in the river Thames, below the outfall sewer, and, therefore, below the level of any storm overflow which could be constructed. It was decided to contribute one-half the net cost, estimated at £20,000, of an improvement proposed to be carried out by the St. Giles's district board, by the widening of a portion of Little Queen-street, Holborn. The vestry of St. Luke, Middlesex, was refused permission to borrow a further sum of £15,000 for the purpose of completing the improvement in Golden-lane; but was granted permission to borrow £12,000 for carrying out improvements in Bath-street and Lever-street. It was also resolved to advance £6,000 to the Guardians of St. George's-in-the-East for purchasing land and the buildings thereon adjoining their workhouse; to advance £19,000 to the St. Marylebone Guardians for works at the new infirmary; and also £33,000 to the Guardians of the hamlet of Mile-end Old Town for the erection of a new infirmary. In consequence of complaints having been made that the communication of glanders and other contagious diseases is probably facilitated by the condition of the public drinking-troughs, it was agreed, on the recommendation of the sanitary committee, to write to the Metropolitan Drinking Fountain and Cattle Trough Association, and other bodies and persons who provide public drinking troughs in the Metropolis, suggesting that such drinking troughs should be so constructed and used as to have a constant flow of water passing through them and running off, by means of a tumbling bay, direct to a gully; and that measures should be taken to insure the troughs being thoroughly cleansed every morning. A letter was received from the vestry of St. Luke, calling attention to the condition of that portion of the frontage of Coleman-street, Bunhill-row, which has recently been set back by the board in connection with their Whitecross-street (Improvement) Scheme, and to the danger occasioned by the condition of the paving, and the absence of a sufficient number of lamps; and pointing out the desirability of the Board constructing a proper brick sewer in the street for the purpose of carrying off the drainage from the blocks of buildings which will shortly be erected, and of the enlarged area of surface drainage of the street. This was referred to the works committee.

ANCIENT EMBROIDERY.†

Modern embroidery and art needlework must, with a few remarkable and praiseworthy exceptions, rank amongst the least successful of our art revivals. The causes are not far to seek. Men are not needlewomen, and women, until recently, have been, from no fault of their own, so completely ignorant of art principles, and their tastes, not seldom naturally good, so terribly perverted by the study of fashion instead of beauty, that, with the best intentions in the world, their productions have been of a character to excite anything but reasonable admiration. Those who are familiar with some of the fearfully and wonderfully wrought cloths, frontals, and vestments, which are to be seen in many modern or restored churches, will agree with us in deprecating the total waste of the labour put forth, so far as any real art-effect is concerned. Into the hands of many of the fair devotees of the needle we should hardly venture to put such a book as that of Mrs. Mary Barber. Much that is simply quaint in the old examples, of which she gives such marvellously accurate reproductions, would be travestied, and the real lessons of the old work would be altogether missed; but to those who have taken the pains to learn first principles, and have the gift of discrimination, we could not well introduce a more useful or interesting book. The not very numerous examples of old Church embroidery are little known, and inaccessible to most of us. In Mrs. Barber's book we have 30 specimens probably of the best work existing, and for the most part reproduced in chromo-lithography in a very superior manner. Instances here and there, with which we should be disposed to find fault, are doubtless due to the difficulty, which the authoress herself mentions, of deciding in some cases as to the exact tone of the colours in old work, which has frequently suffered injury from time and careless treatment. One thing must force itself upon the mind of the reader of this book, and that is the universal absence in these old examples of effort for mere effect's sake, and the sparing use of ornament. Yet there is nothing like monotony to be found, for the ingenuity which in our own day would have fretted itself away in a search for new patterns and designs, found a better task in varying the arrangement and treatment of the old ones, and the result is a constant freshness, and a real originality, altogether absent from much modern work.

The book, which was written at his suggestion, has been superintended for publication, since the death of the authoress, by Mr. Butterfield; and the publishers deserve the highest possible praise for their share in the work.

THE ASSOCIATED CARPENTERS AND JOINERS OF SCOTLAND.

The nineteenth annual report of the association has just been issued by Mr. William Paterson, the general secretary. The report states that there have been no disputes of any moment during the year, and that few changes have taken place in the condition of labour in the trade. Work has been difficult to procure, and many members have had to contend with long periods of enforced idleness. The long-continued depression in the building trade has been productive of much anxiety and misery to many workmen who were formerly in very comfortable circumstances. The number of operative joiners in Scotland has decreased to a great extent, and those remaining cannot procure regular employment. The joiners in the shipyards on the Clyde work three hours per week more than those in all other towns of any note in the country. The income of the association for the year amounts to £6,333 6s., being a decrease of £1,026 6s. 5½d., as compared with the previous year. There have been paid as sick aliment, £2,743 1s. 7d.; as funeral allowance, £555; as superannuation allowance, £79 11s.; as compensation for tools, £398 3s. 11½d.; as strike allowance, £30 11s. 10½d.; as "victimised" allowance, £11 2s.; and £350 as bonuses to seven disabled members. The gross expenditure for the financial year 1880 amounts to £6,304 9s. 10d., which leaves a balance of £28 16s. 2d. upon the year, and makes the funds in hand, £8,623 14s. 2¾d. Of this sum, £3,441 9s. 5¼d. is the property of section 2nd; and the remainder, £5,182 4s. 9½d., belongs to section 3rd, or the sick section. There is a net profit of £181 1s. 1d. to the trade section, and a loss of £151 4s. upon the sick section. The result is in a great measure due to unusually high sick and death-rates; but there is every reason to fear that many claimants for sick benefit do not have their cases so strictly inquired into as a proper reading of the rules requires. A return has been made for the first time of the plant belonging to the branches and the executive committee. The return shows a valuation of £476 3s. 2d., and which, added to the funds on hand, brings them up to a total of £9,099 17s. 3d. The report also states that there is a decrease of 1,432 members during the year, the number now on the books being only 4,673.

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† Some Drawings of Ancient Embroidery. Thirty specimens. By Mrs. Mary Barber. Edited by W. Butterfield. London: H. Sotheran and Co.

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ILLUSTRATIONS.

THE NATIVITY, BY ALBERT DURER.—ST. MARY MAGDALENE'S COLLEGE, OXFORD.—THE APOSTLES' CREED: BY J. DE GHEYN.—MR. LUKE FILDES' HOUSE AND STUDIO AT KENSINGTON.—A DRAWING-ROOM CORNER AND OCTAGON BOUDOIR.—PROPOSED NEW R. C. CATHEDRAL AT HONG KONG.—NEW CHURCH, JOHN-STREET, BERKELEY-SQUARE.—THE HOTEL DE VILLE, BRUSSELS.—WESTWOOD HOUSE, SYDENHAM. — CHIMNEY-PIECES AND OVERMANTELS IN WOOD.

OUR LITHOGRAPHIC ILLUSTRATIONS.

THE NATIVITY, BY ALBERT DURER.

For description see p. 773.

THE NEW BUILDINGS, MAGDALEN COLLEGE, OXFORD.

We give illustrations of these important new buildings. One is a bird's-eye view, showing the new buildings completed. At present the south and east elevations only are being carried out. It will be seen that the design is in harmony with old Oxford work, and, indeed, with that of Magdalen College, which is, perhaps, the most beautiful of all the Oxford colleges. The present work adds thirty sets of rooms, of good dimensions, for undergraduates, two sets for fellows, and lecture-room, &c. The foundations are in, and the work will be continued in the early spring. The design is by G. F. Bodley and T. Garner, architects, of 14, South-square, Gray's Inn. The view is made looking west from the existing buildings.

THE APOSTLES' CREED. BY J. DE GHEYN.

We have in this issue the pleasure of laying before our readers a portion of a series of fine old Flemish figure subjects, the work, in the first instance, of Carl van Mander, otherwise Charles Vanmander, and in the second, of James de Gheyn the elder, to whom we are indebted for the engraving. Of Carl van Mander we learn that he was born in Flanders in 1548, that he was tutored in the art of painting by Lucas de Heere, of Ghent, and Peter Vlerick, of Courtray. He subsequently studied at Rome, the effects of which may be traced in the works we illustrate, for they are strongly marked by the Classic or Rennaissance, which was not a plant of Flemish or German growth. From Rome he removed to Vienna, where, from an attachment for his native land, he refused the office of painter to the Emperor. In his native country he executed some masterly works; but his quiet was disturbed by the outbreak of war. His next remove was to Haerlam, in the freed provinces, where he founded an academy of art on the lines of the Italian school. His last move was to Amsterdam, where he died in 1606. In death his brow was crowned with laurels, and his remains were followed to the grave by a picturesque group of three hundred friends. His works, although possessing a deal that is Flemish or German in their composition, are strongly marked by the Classic feeling of his time. His studies in Rome followed close upon the decease of Michael Angelo, whose teaching may be seen in the works we illustrate, more particularly in the muscular development of the figures. His monogram is an arrangement of Kam for Karl Mander. James de Gheyn the elder was born in Antwerp in 1565, and received the rudiments of drawing from his father, a glass-painter. For his knowledge of engraving he was indebted to Henry Galtzins, an artist whose studies were principally directed to the works of Michael Angelo and his classic contempories, and hence it follows that de Gheyn was a great admirer of the works of Van Mander, and pleasingly devoted himself to engraving the same. The monogram of this artist, who died in 1615, is an arrangement of D and G for De Gheyn. The date of these works is not precisely known, but their age may be taken at nearly three hundred years. This celebrated series of figures, the remainder of which we shall reproduce in our next issue, consists of twelve plates, illustrative of the Apostles. In a complete state they consist of fourteen plates, twelve only being at our disposal for reproduction. These are adorned with texts from the Apostles' Creed in the style made familiar to us by the old artists in painted glass. Our first figure, marked II., is a masterly drawing of St. Andrew, with his cross symbolical of the instrument upon which he was crucified at Patras (A.D. 70). Our next, marked III., is St. James the Great with his symbols, a scallop shell and a pilgrim's staff, allusive to his journeying over sea from Palestine. Near his feet is a sword, the instrument of his execution. Our next, marked IV., is St. John with his cup, allusive to the cup of poison from which Satan, in the form of a dragon, took wings upon the saint making the sign of a cross upon the vessel. In his right hand he bears his gospel, and near him is seen a cauldron of boiling oil, allusive to the tradition of his being plunged into such a vessel before his banishment to Patmos. The fine figure marked V. is St. Philip bearing a long staff surmounted with a cross, symbolical of his death which resulted from being suspended by the neck from a tall pillar. Our next, marked VI., is St. Bartholemew with his knife, allusive to the instrument by which he was flayed alive; a saint rendered historical by the great massacre of Protestants in France on his festal day, 1572. Our next figure, marked VII., is St. Thomas, with his right hand on his gospel and his left holding a spear or halbert, the instrument by which he was slain at Nadahar. (These figures are reduced in scale from the originals, loaned to us by Mr. W. Stevenson, of Hull.)

ARTISTS' HOMES: NO. 9.—MR. S. LUKE FILDES' HOUSE, KENSINGTON.

Last week we briefly described the house and studio erected from the designs of Mr. R. Norman Shaw, R.A,, for Mr. S. Luke Fildes, A.R.A., the painter. To-day we publish a perspective view taken from the Melbury-road, and photographed by Messrs. Bedford Le Mere, specially for us.

A DRAWING-ROOM CORNER AND AN OCTAGON BOUDOIR.

These two interior views may be taken as specimens of the drawings with which Mr. R. W. Edis' forthcoming book on "The Decoration and Furnishing of Town Houses" will be illustrated. These plates are here only slightly reduced from the originals, but in the book itself the drawings are smaller. Among the subjects illustrated are examples made by Messrs. Gillow, Longden and Co., Jackson and Graham, J. Wedgwood and Sons, Wilcock and Co., Holland and Sons, T. Elsley, Jeffrey and Co., Doulton and Co., The Murano Glass Co., Widdowson and Veal, Minton and Co., as well as several rooms designed by Mr. Edis himself. All the drawings are by Mr. Maurice B. Adams, excepting one, which is by Mr. H. Stacey Marks, R.A.

PROPOSED NEW R. C. CATHEDRAL, HONG KONG.

For description see p. 743.

THE CHURCH OF ST. MARY, JOHN-STREET, BERKELEY-SQUARE.

This church is being built by the trustees of the Grosvenor Estate, to meet the wants of the poorer inhabitants of the immediate neighbourhood, and to supply the place of St. Mary's Chapel in Park-street, which is unconsecrated, and will be pulled down as soon as this church is complete. No district will be assigned, and the new church will be a chapel of ease to the parish church of St. George, Hanover-square. The site is small, and will be entirely covered by the new building. In plan it consists of a nave with side aisles, a chancel and south aisle, and a small tower at the south-west angle. The vestries, &c., are in a crypt under the east end, approached by steps on the north side of chancel. The church is being built of red brick and Ham-hill stone externally. Internally picked stocks and white bricks in bands are used as well as red, with Bath stone. Lascelles' material is also used for some of the shafts. The chancel with its south aisle is groined with stone ribs and brick filling in, the vaulting shafts being of Purbeck marble. The roofs of nave and aisles are of pitch-pine. Mr. Blomfield, M.A., is the architect, and the contractors are Messrs. Macey and Sons.

HOTEL DE VILLE, BRUSSELS.

This well-known example of Continental Gothic art needs little description on the present occasion, while the characteristic drawing which we reproduce to-day very fairly illustrates the market-place as the visitor now finds it, with the grand subject of the plate in the rear. The drawing was exhibited at the recent Black and White Exhibition, and the author is Mr. Henry C. Brandling.

WESTWOOD HOUSE, SYDENHAM.

Mr. J. L. Pearson, R.A., is the author of this most interesting and able work. His geometrical drawings of the same building were exhibited this year at the Royal Academy, while our illustration to-day is taken from the view which formed so conspicuous an exhibit at the same gallery a year or so ago. The work is now in course of erection, and consists in the recasting of an old house, to which considerable additions are also now being made. As an example of Renaissance design from the hands of one of our most eminent and exclusively "Gothic" architects, this illustration is of special interest.

CHIMNEY-PIECES AND OVERMANTELS IN WOOD.

Among our plates is a double page sheet of drawings illustrating several wooden mantel-pieces and treatments for fireplaces, from the designs of Mr. Maurice B. Adams, A.R.I.B.A., and made by Messrs. Frederick Edwards and Son, of Great Marlborough-street, W. Few features in an English house play a more important part than the mantel-piece and fire-place, and certainly none have been more influenced by change in prevailing tastes and styles. Messrs. Edwards have endeavoured to supply the desire expressed by several of their customers, that they should manufacture wooden mantel-pieces ready for use, either in conjunction with their own well-known grates or others of similar make. We give a selection of their designs, and may add that the treatments of overmantels and cabinets, instead of the lately fashionable huge "pier glass," for the display of china and other ornaments, has much to recommend it.

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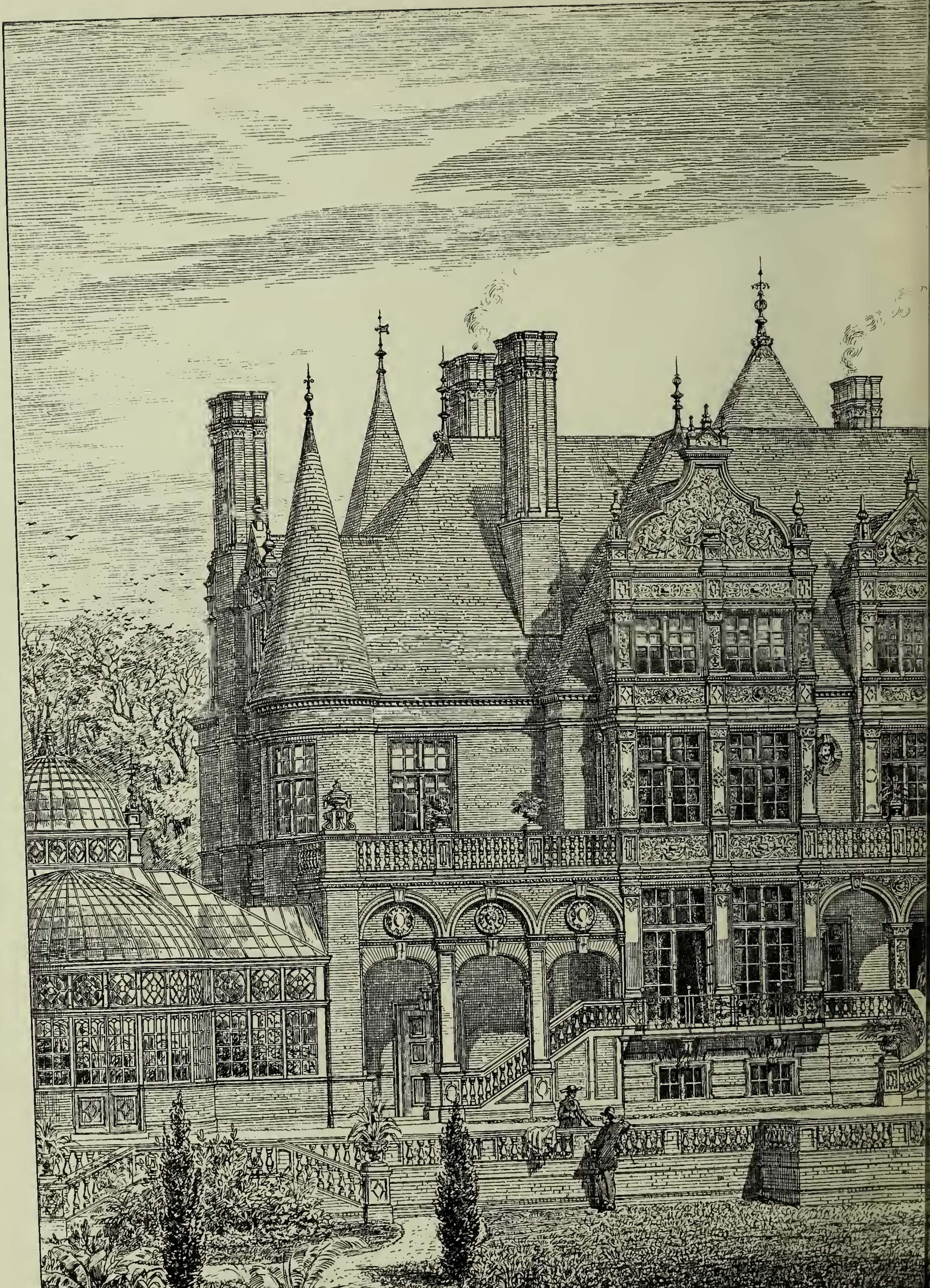
The new buildings of the Mary Datchelor Girls' School, in Grove-lane, Camberwell, are to be formally opened to-day (Thursday). The new schools, which have been erected from the designs of Mr. T. Chatfeild Clarke, were fully described in our issue for the 13th ult. (p. 533), in an article on "Buildings in South London."

A mechanics' institute is about to be erected at Horsforth, near Bradford, from the designs and under the superintendence of Messrs. Milnes and France, architects, of Bradford.

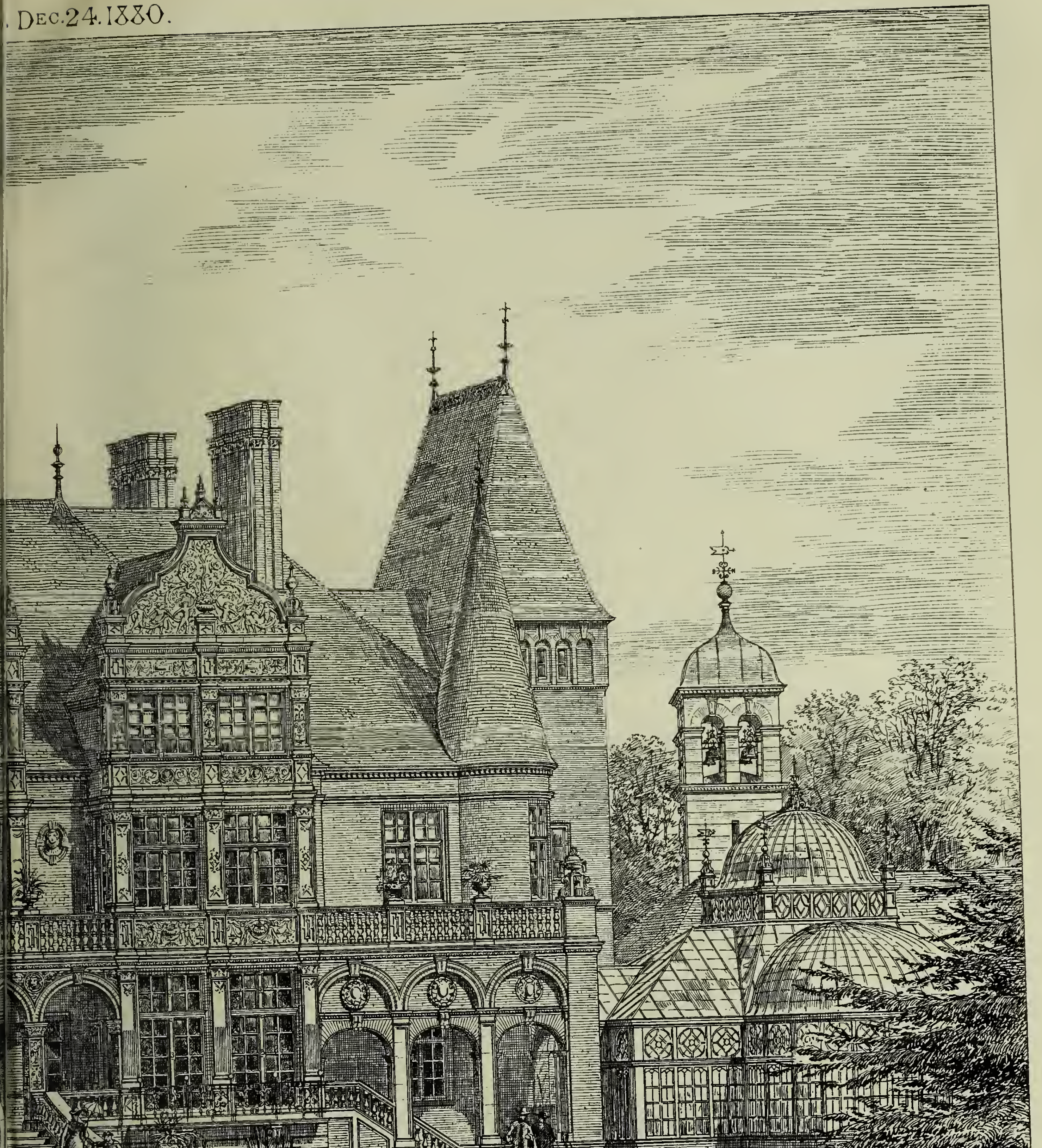
New Board-schools in Campbell-street, Maida-vale, were opened by Charles Reed, M.P., as chairman of the London School Board, on Monday. They have been built by Mr. W. Tongue, contractor, of Plumstead, under the supervision of Mr. E. R. Robson, F.S.A., architect to the board. They have cost £6,700, and accommodate 800 children.

A local inquiry has been held before Major Hector Tulloch, R.E., on behalf of the Local Government Board respecting an application from the select vestry of Richmond, Surrey, for permission to borrow a sum of £18,000 for purposes of water supply, including the sinking of a well 1,000ft. deep.



WESTWOOD

JOHN L.



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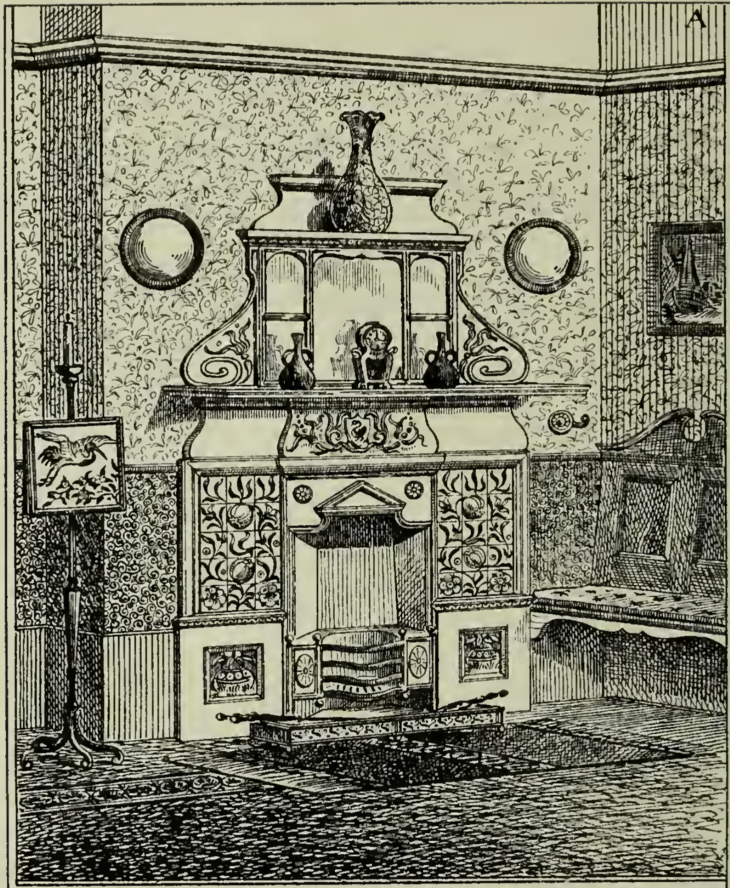
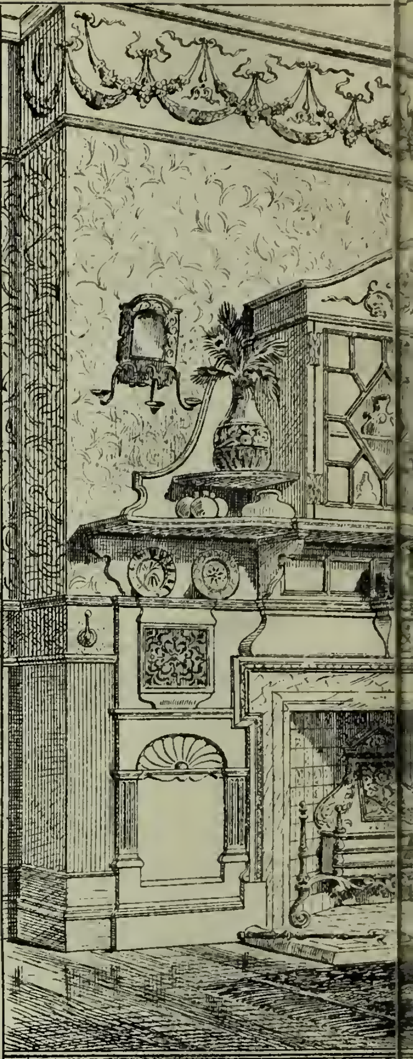
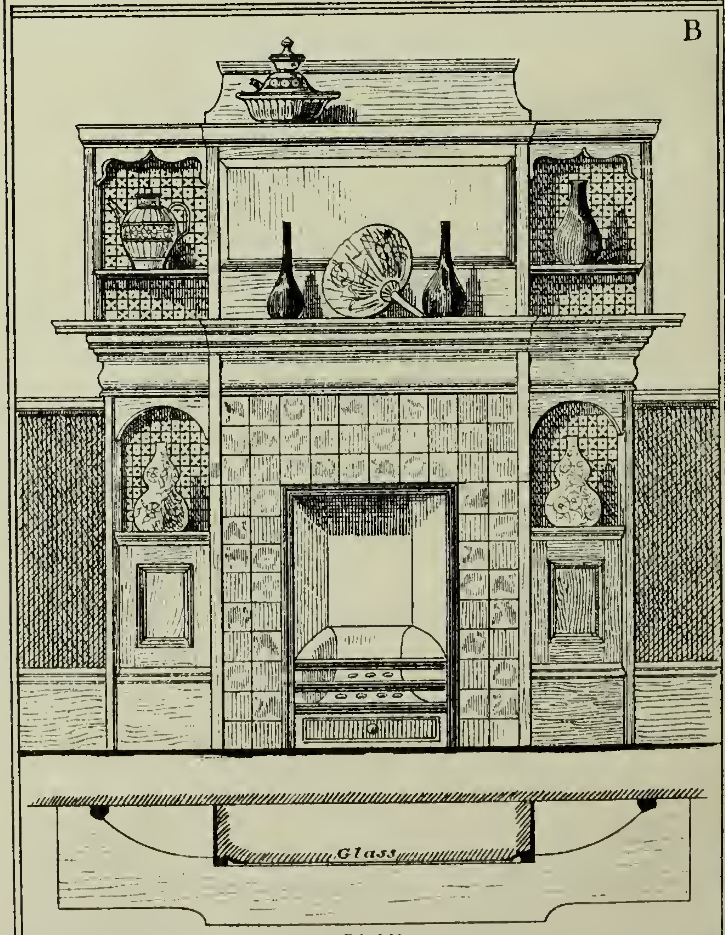
D OUSE, SYDENHAM.

L. ARSON R.A. ARCHITECT.

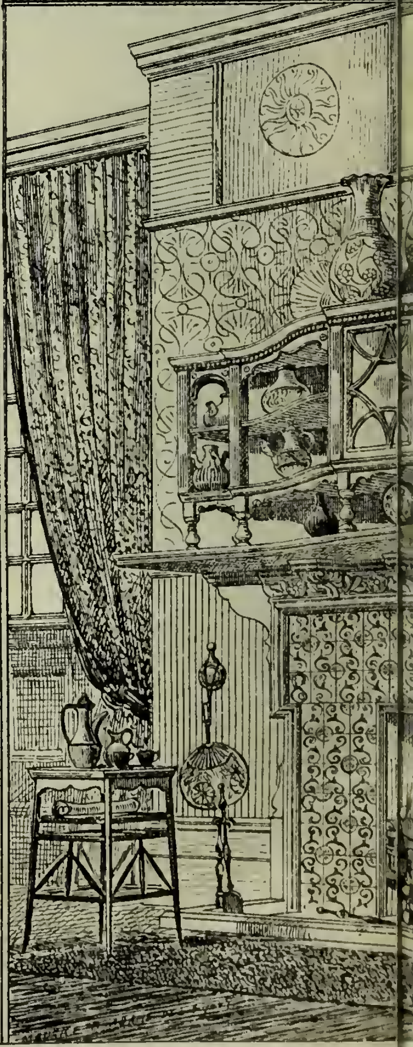


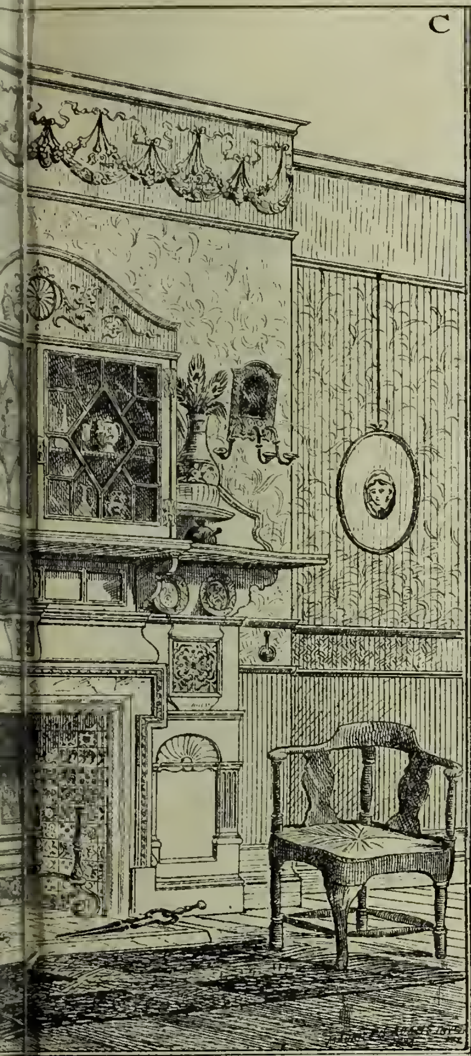


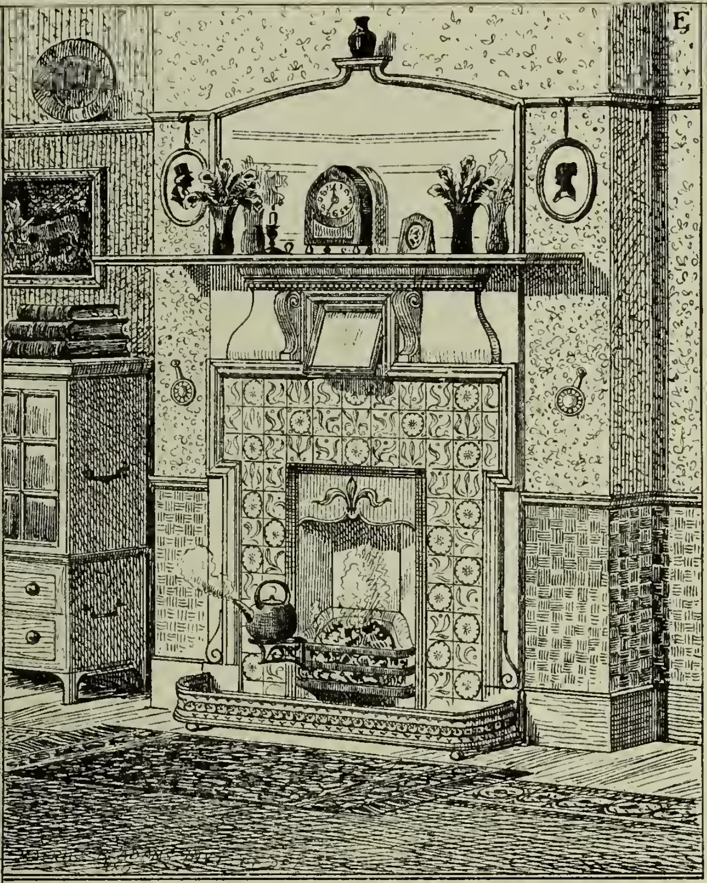
·CHIMNEY·PIECES· AND·OVERMANTELS ·IN·WOOD·



Maurice B. Adams del.







MANUFACTURED · BY ·

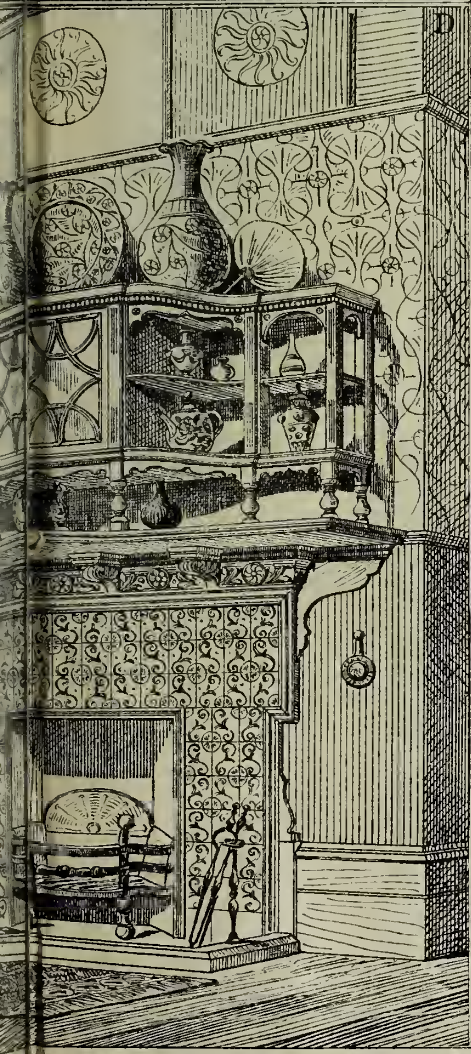
Messrs. FREDk. EDWARDS & SON

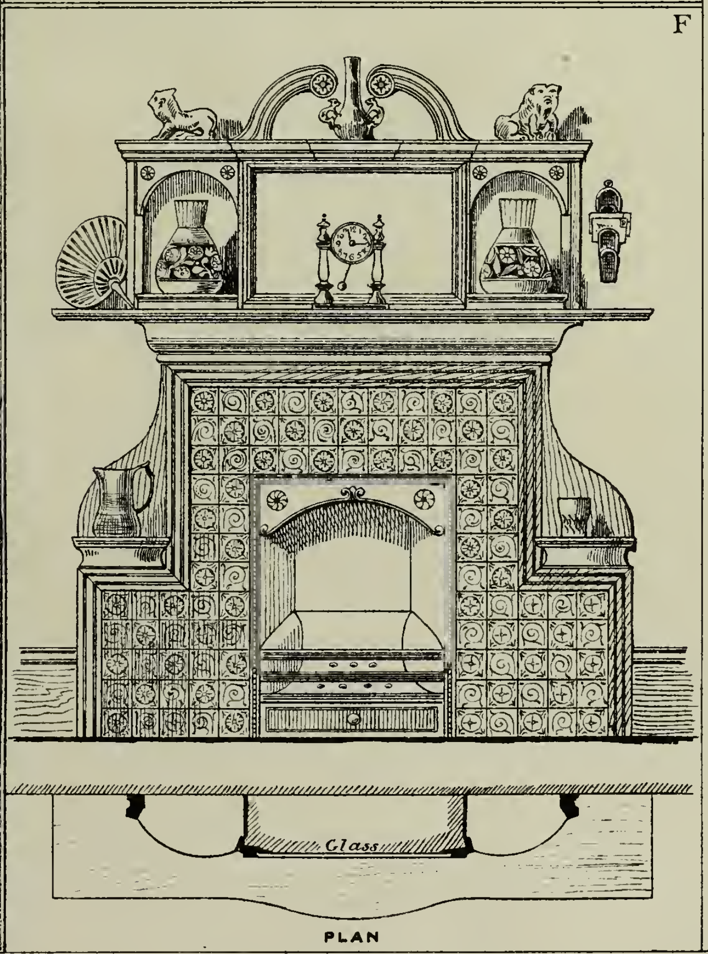
49 GREAT · MARLBOROUGH · STREET · W ·

from Designs by

MAURICE B. ADAMS A·R·I·B·A·

ARCHITECT ·





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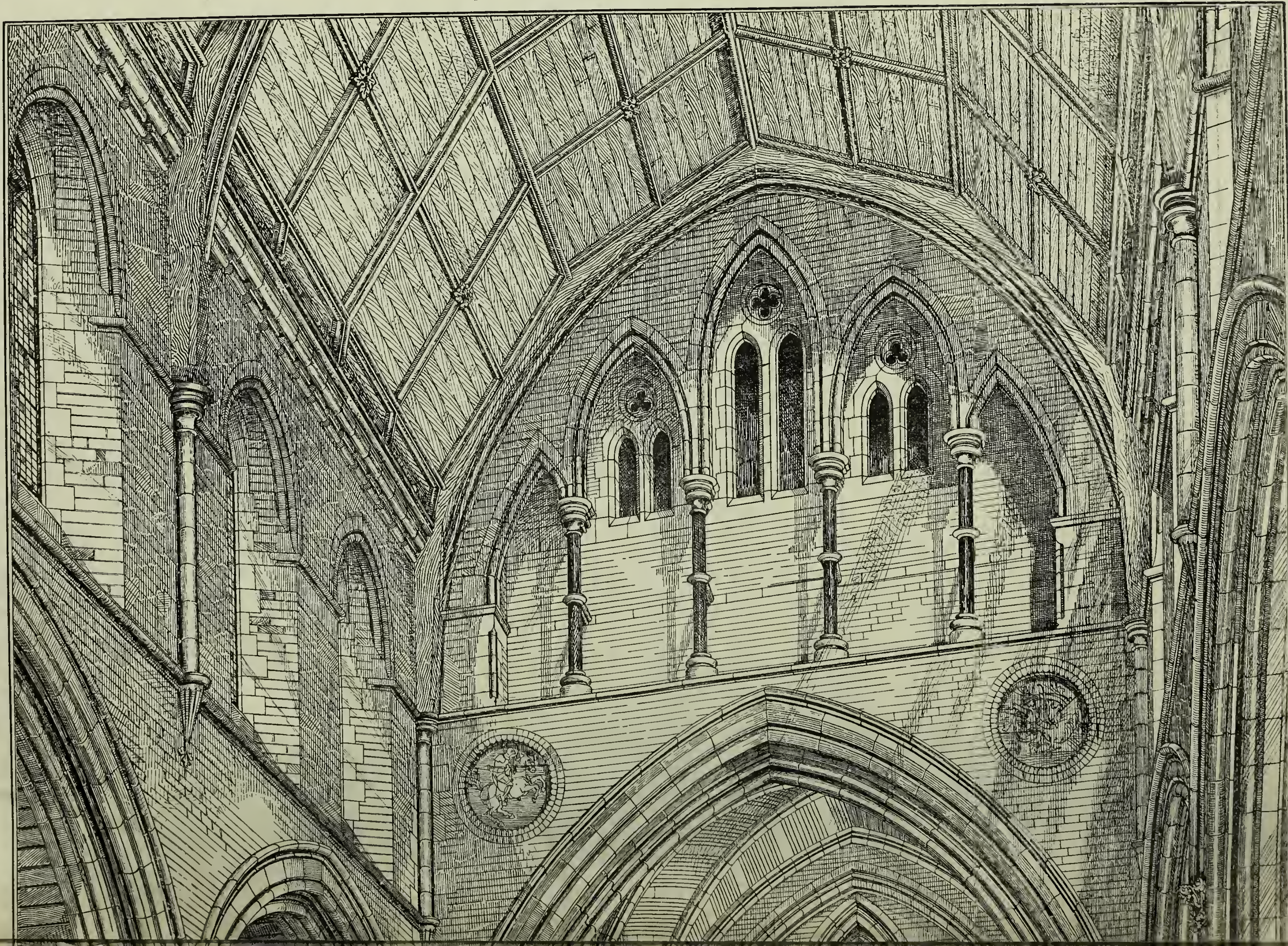

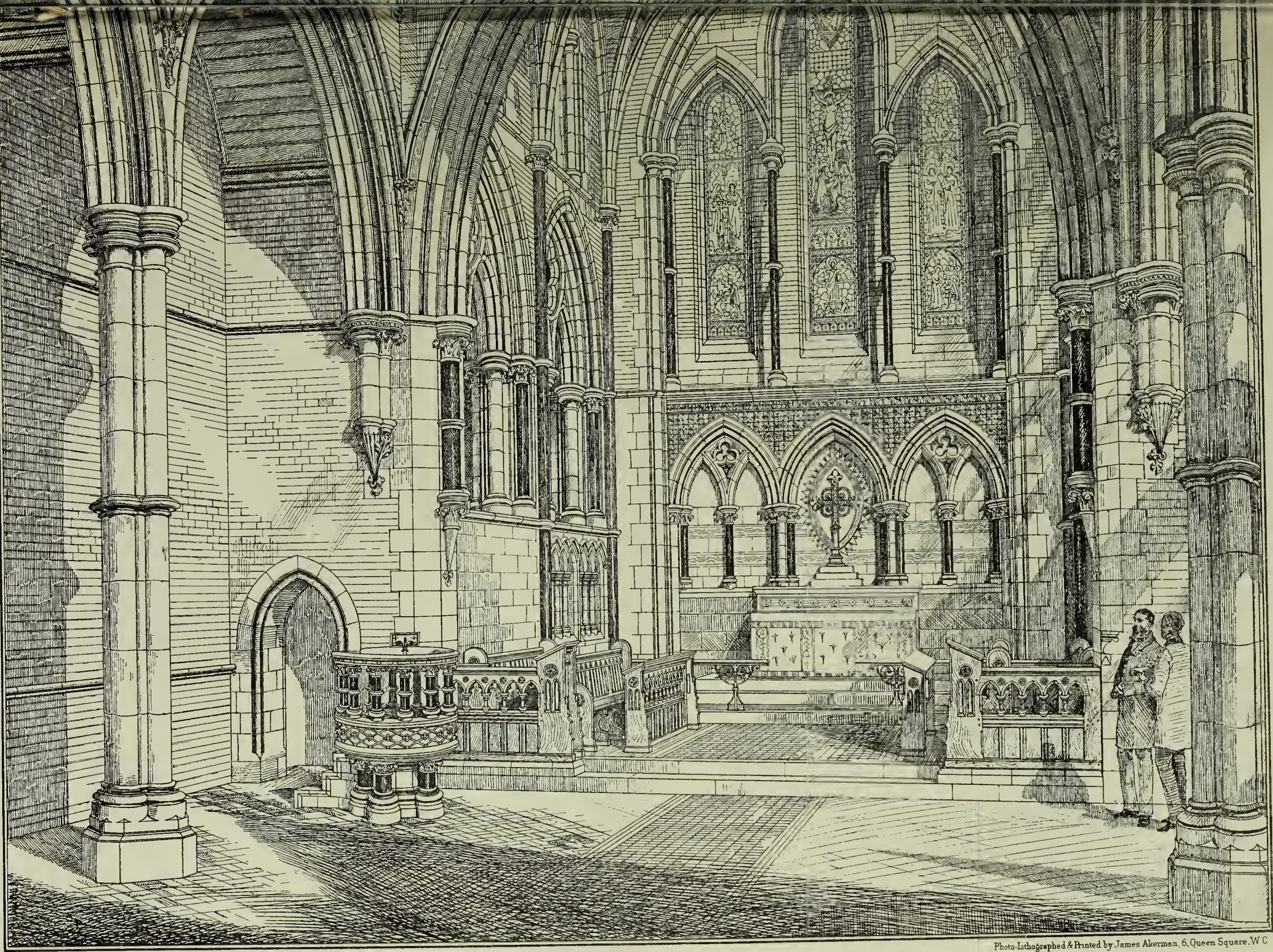

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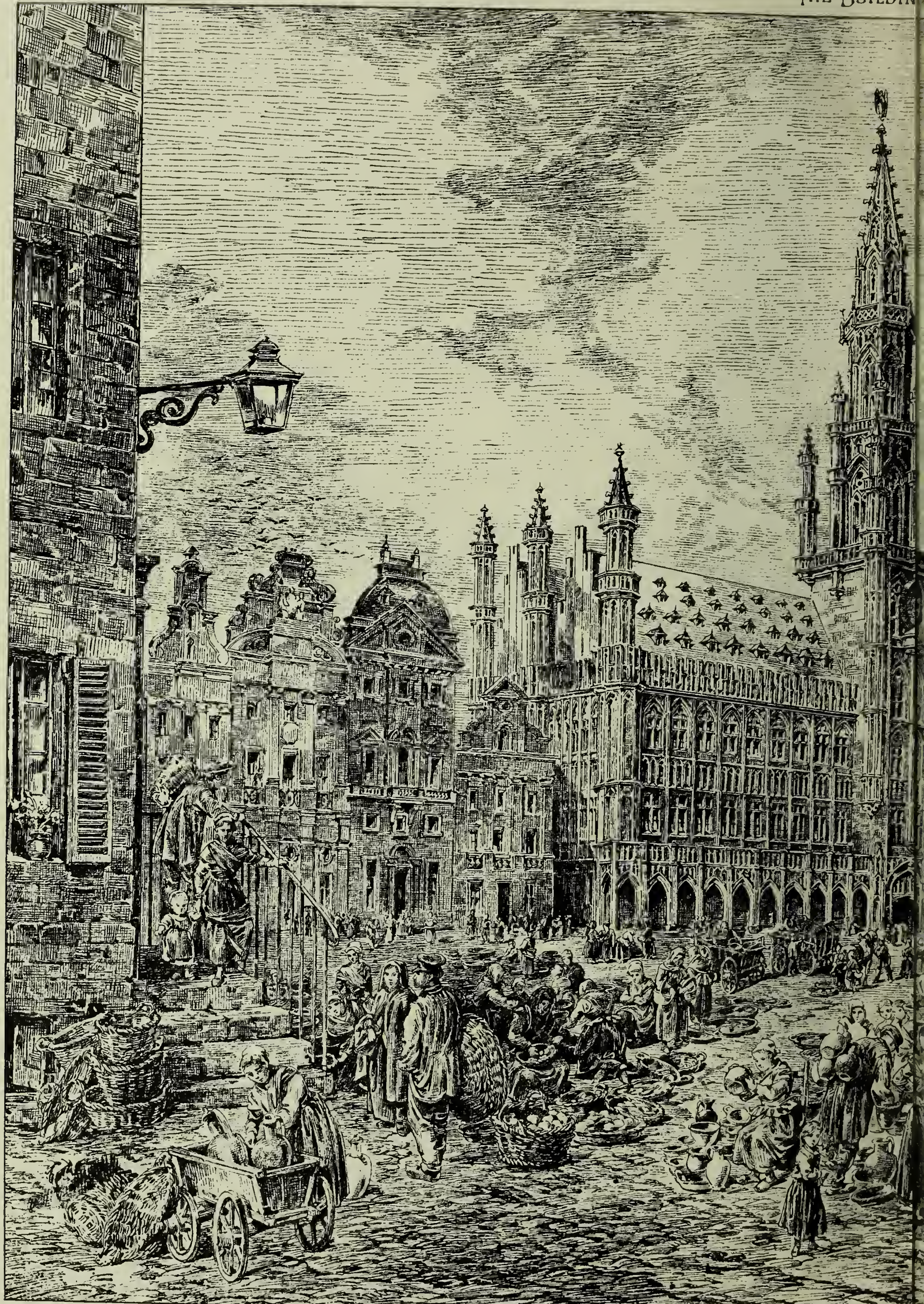
New Church · John · Street · *Berkeley Square* Arthur W. Blomfield M·A· *Architect*·

TY



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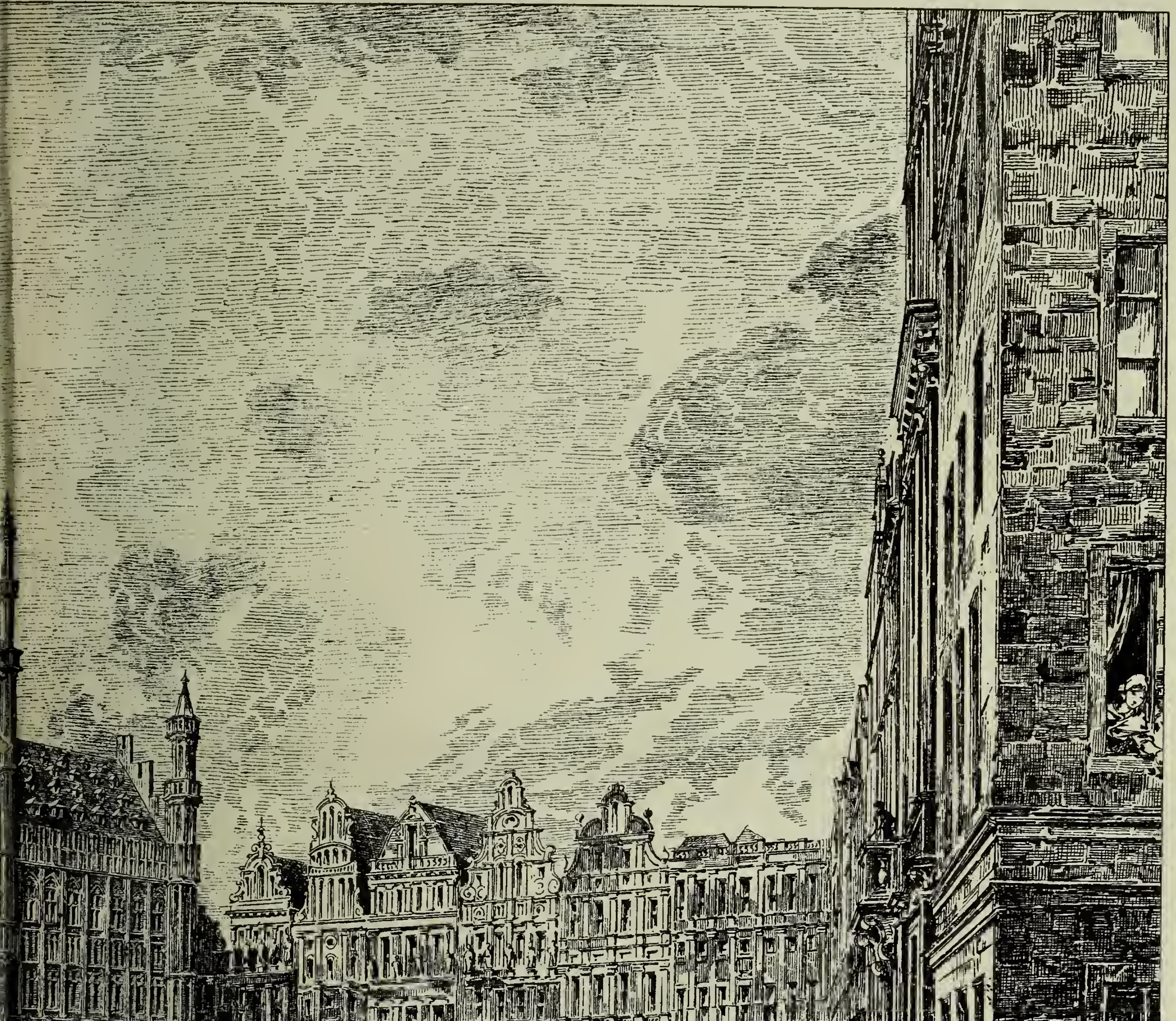

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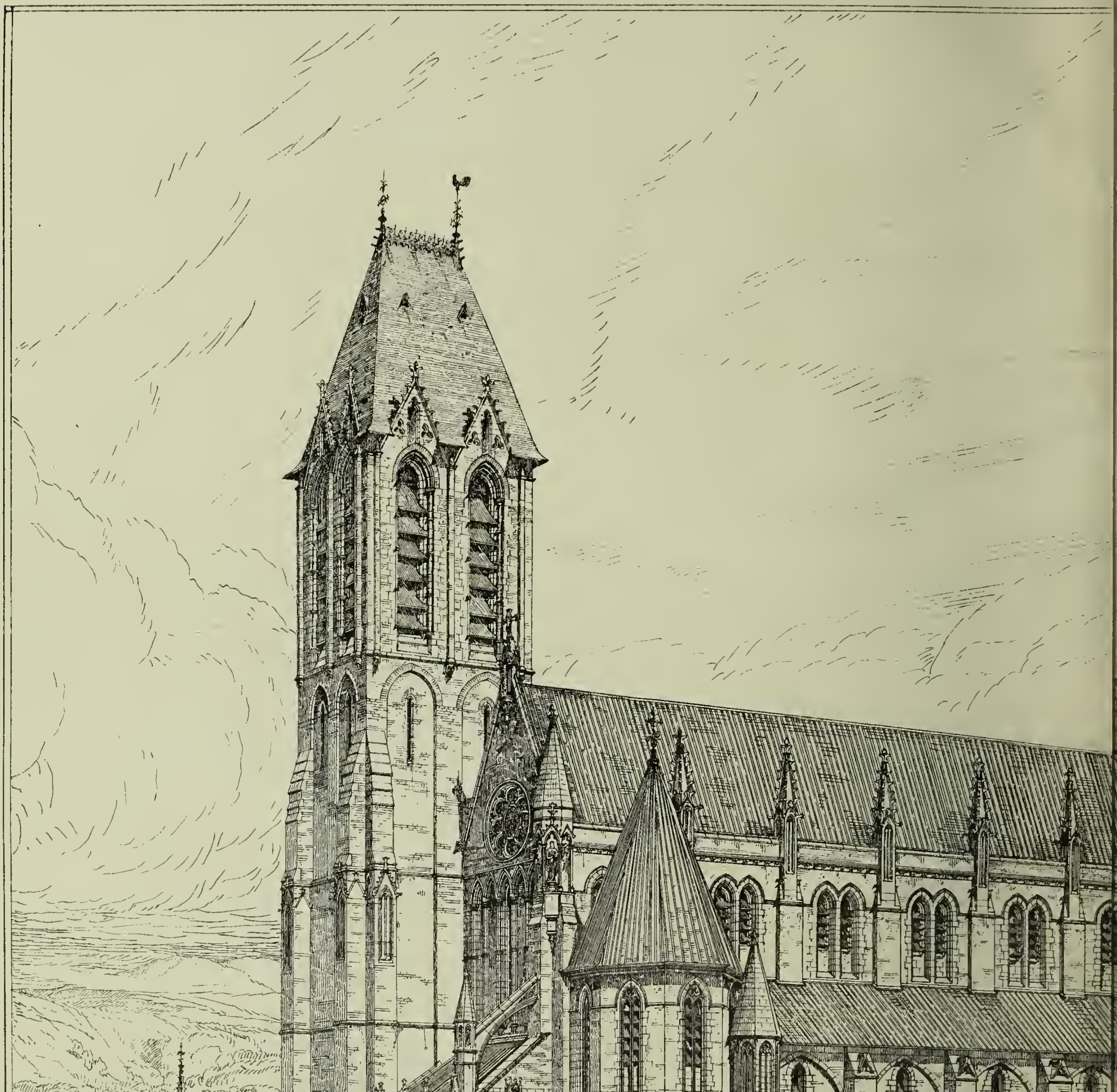
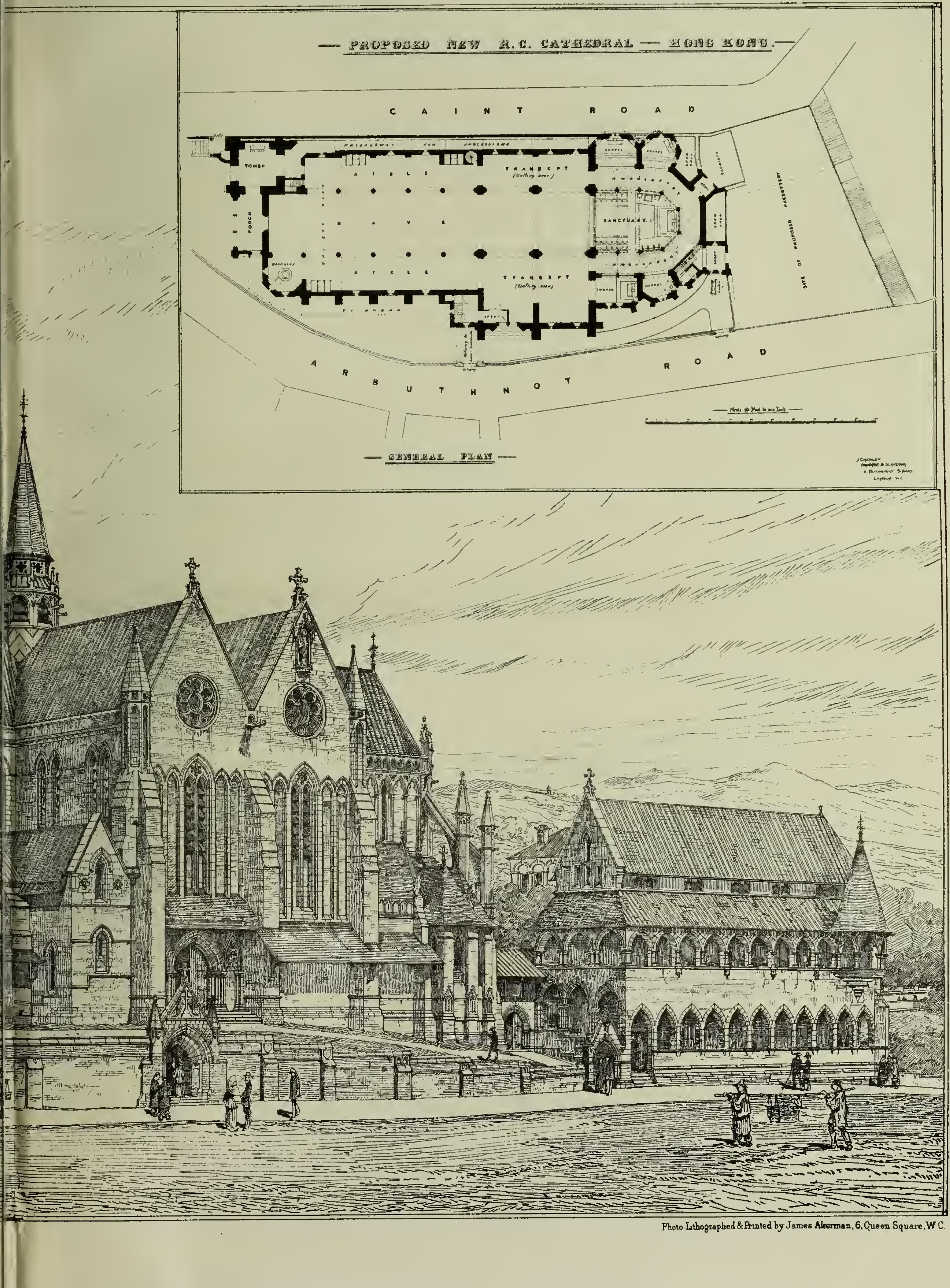
LLE BRUSSELS

RY C. BRANDLING





PROPOSED NEW R.C. CATHEDRAL — HONG KONG.

GENERAL PLAN

J Chawley
Architect & Surveyor
[illegible]
London W.C.

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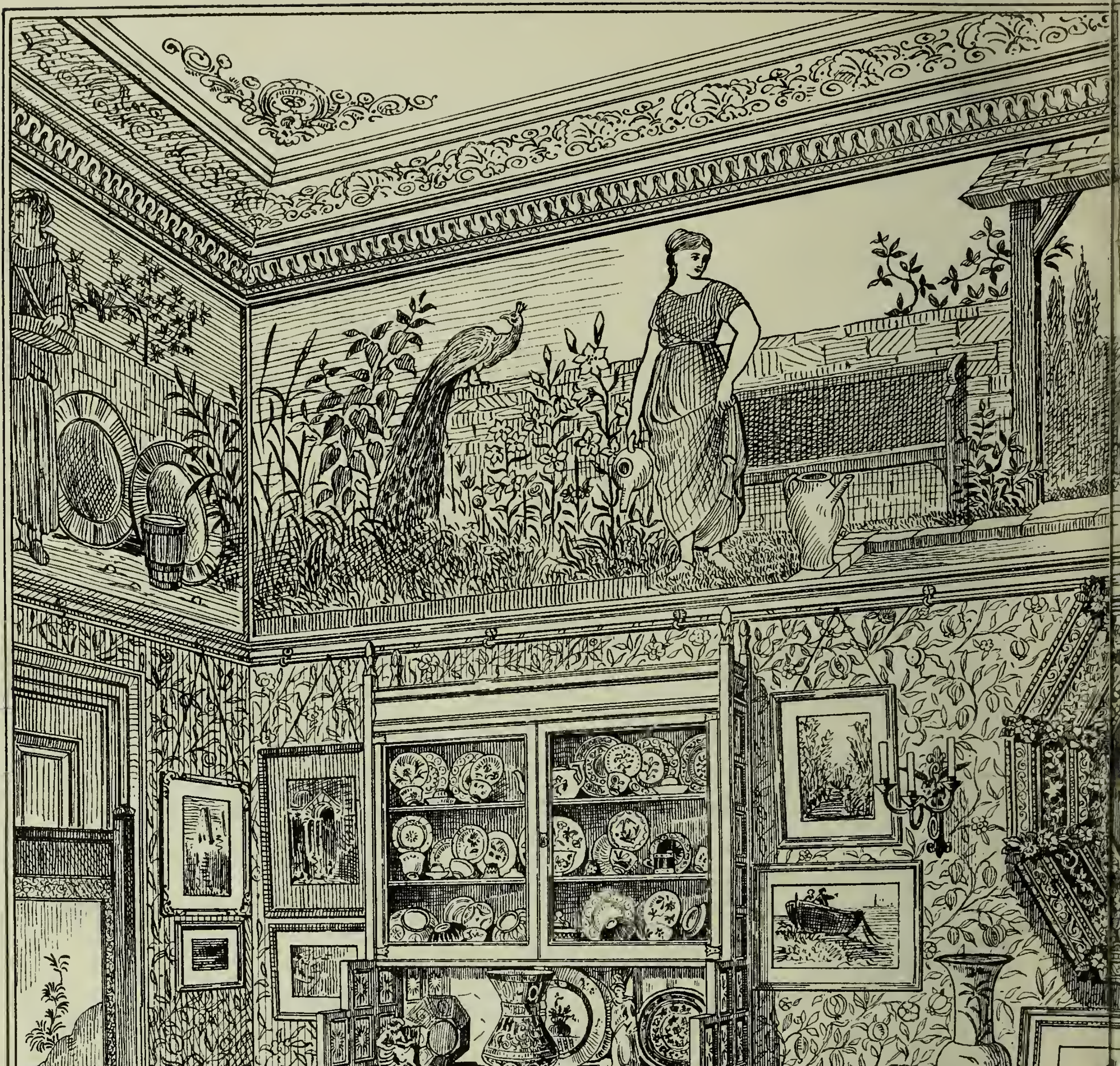
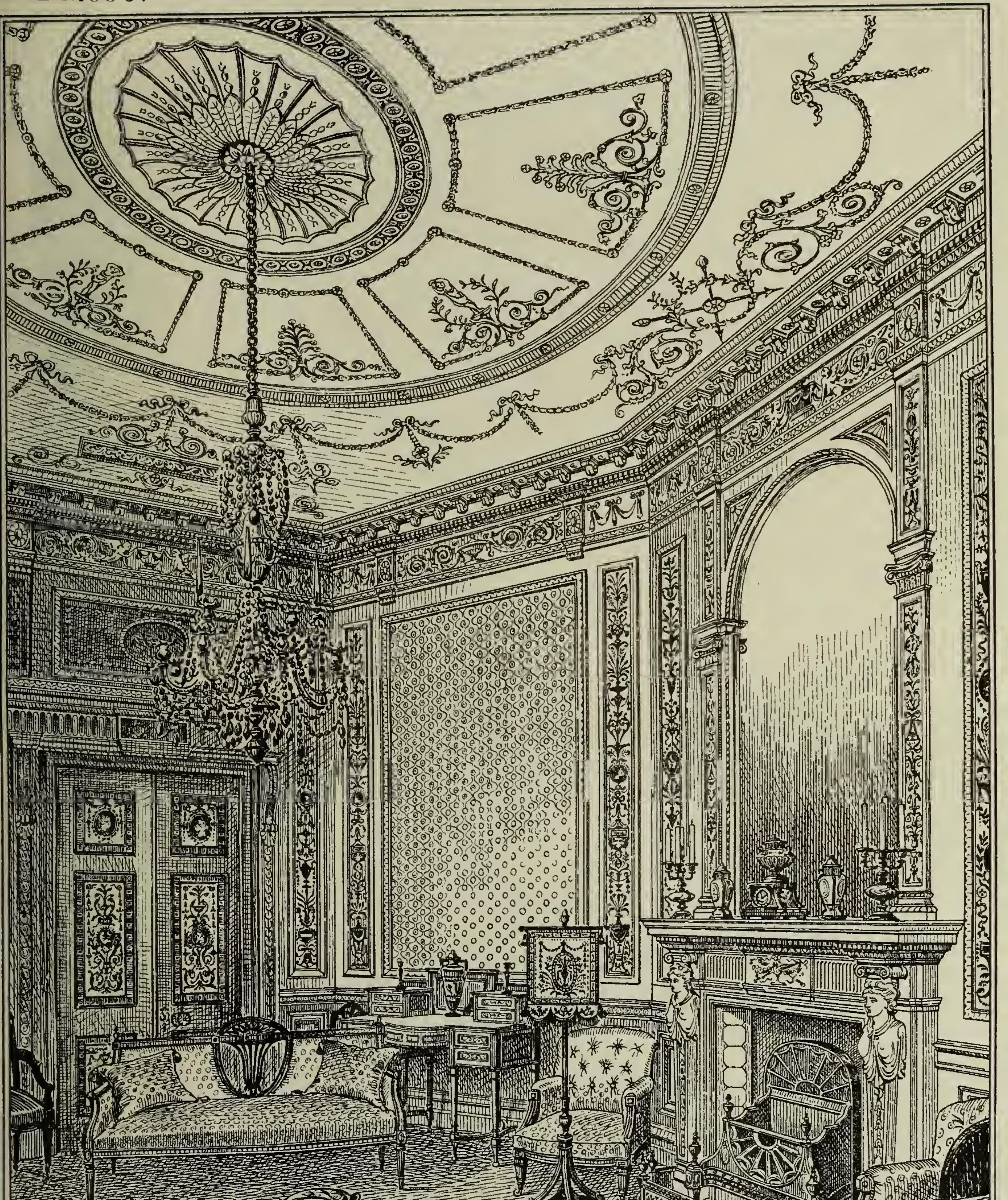


A·Drawing·Room·Corner·

R.W. EDIS, F.S.A. ARCH



Octagon Boudoir · Adams · Style ·   Meſsrs Gillow ❊

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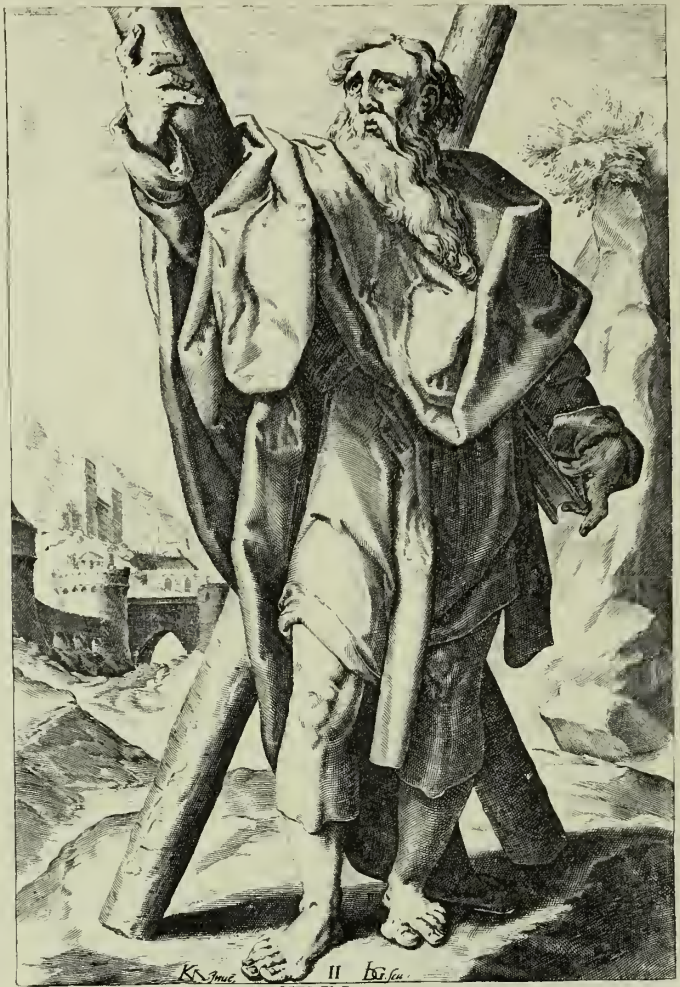
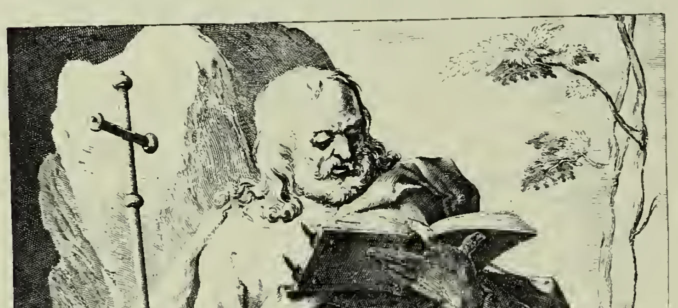

KA Inue. II HG scu.

ET IN IESVM CHRISTVM FILIVM EIVS VNICVM, DOMI-
2 NVM NOSTRVM

QVI CONCEPTVS. EST DE
3 MARIA VIRGINE



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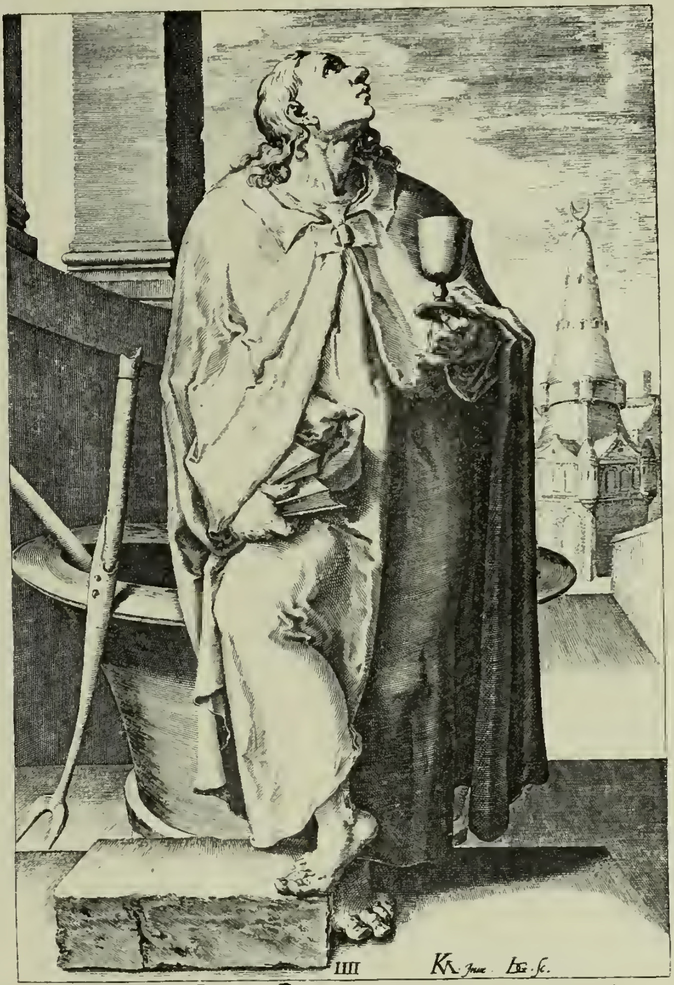
ITV SANCTO, NATVS EX



PASSVS SVB PONTIO PILATO, CRVCIFIXVS, MORTVVS & SEPVLTVS
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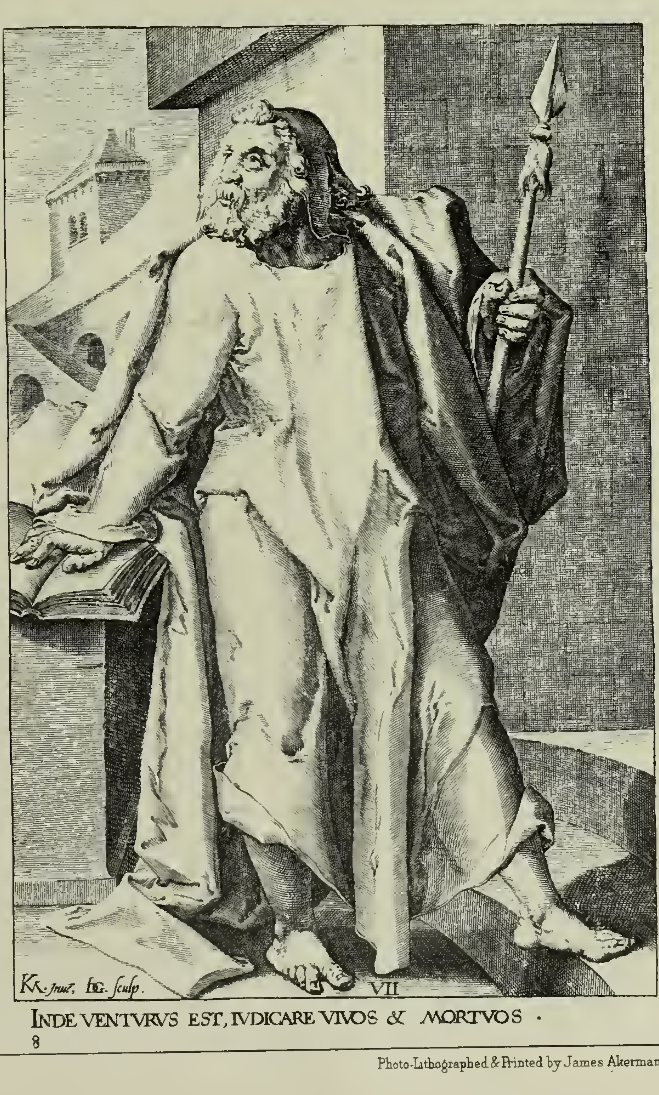

INDE VENTVRVS EST, IVDICARE VIVOS & MORTVOS .
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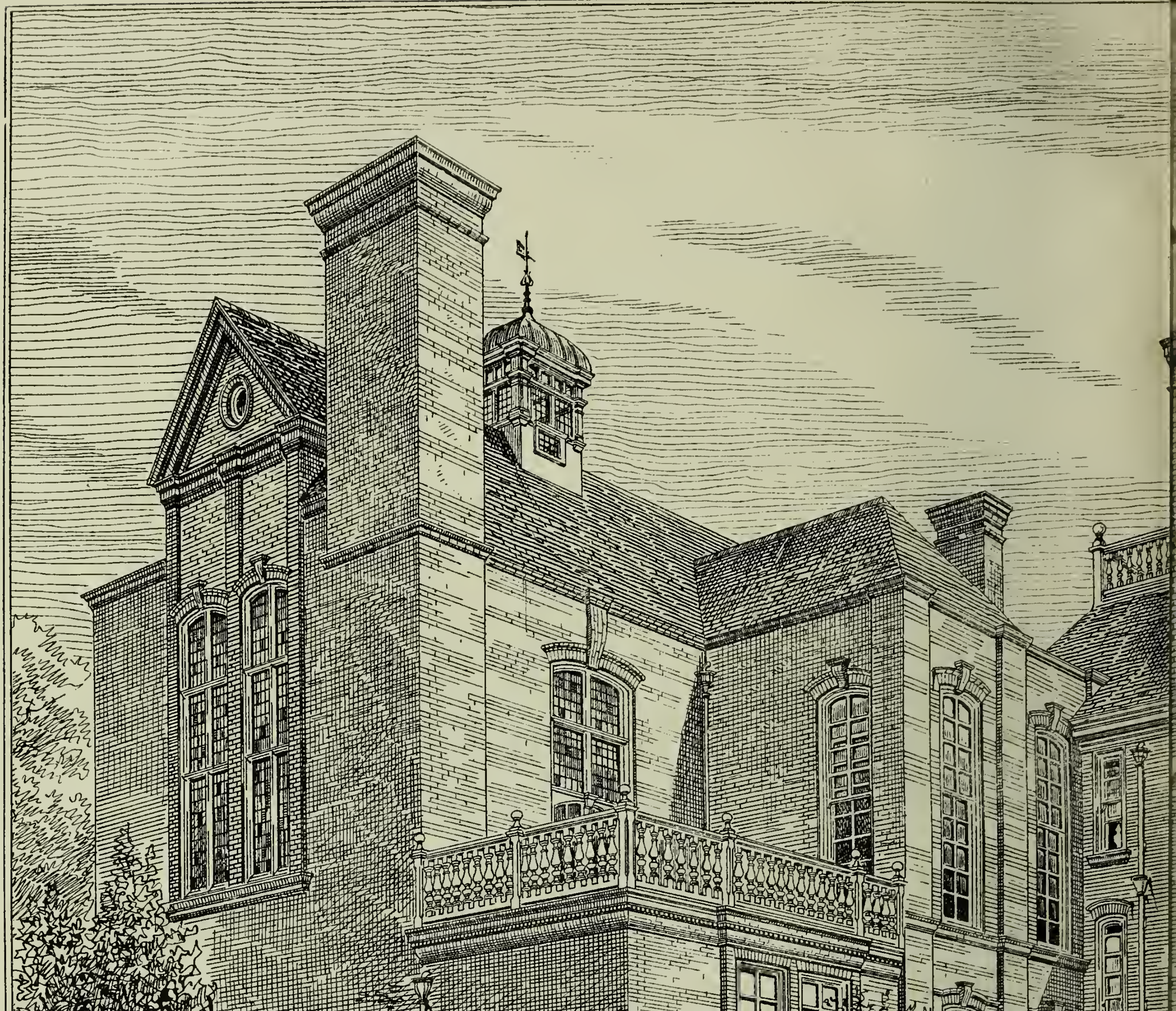
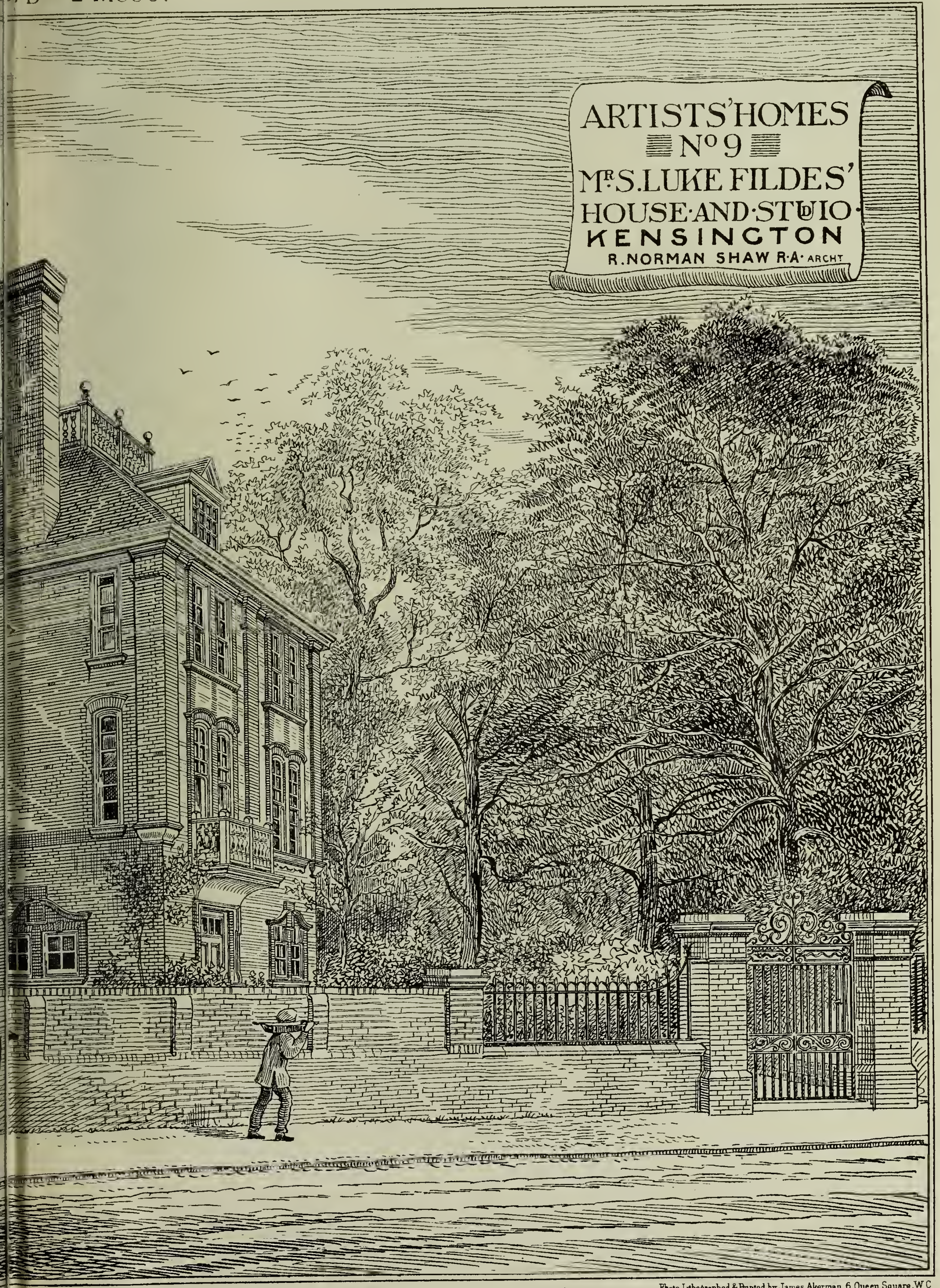
STRATED BY J de GHEYN 1565-1615.


MAURICE B ADAMS DEL 1880



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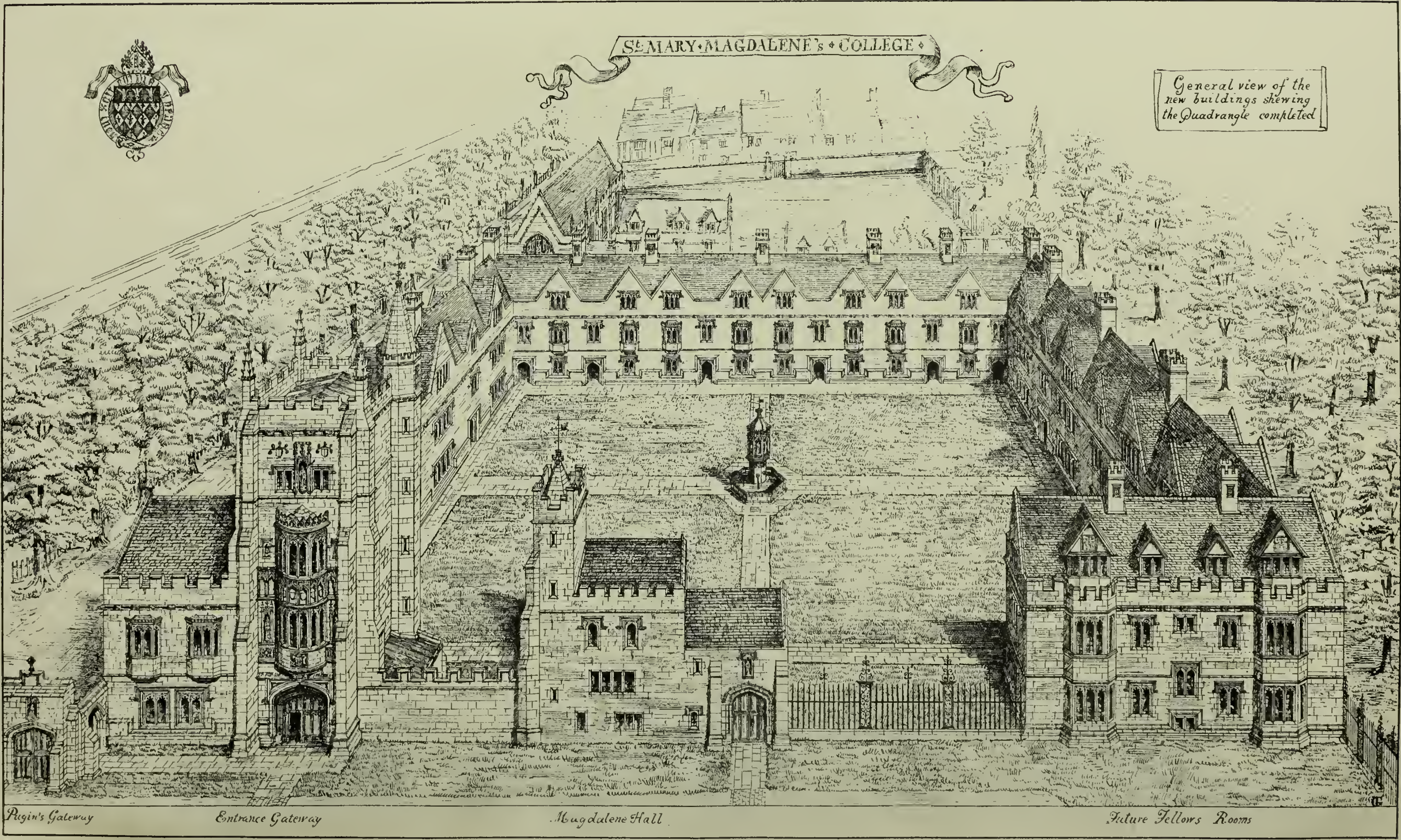
St. MARY · MAGDALENE's · COLLEGE ·
General view of the new buildings shewing the Quadrangle completed
Pugin's Gateway
Entrance Gateway
Magdalene Hall
Future Fellows Rooms

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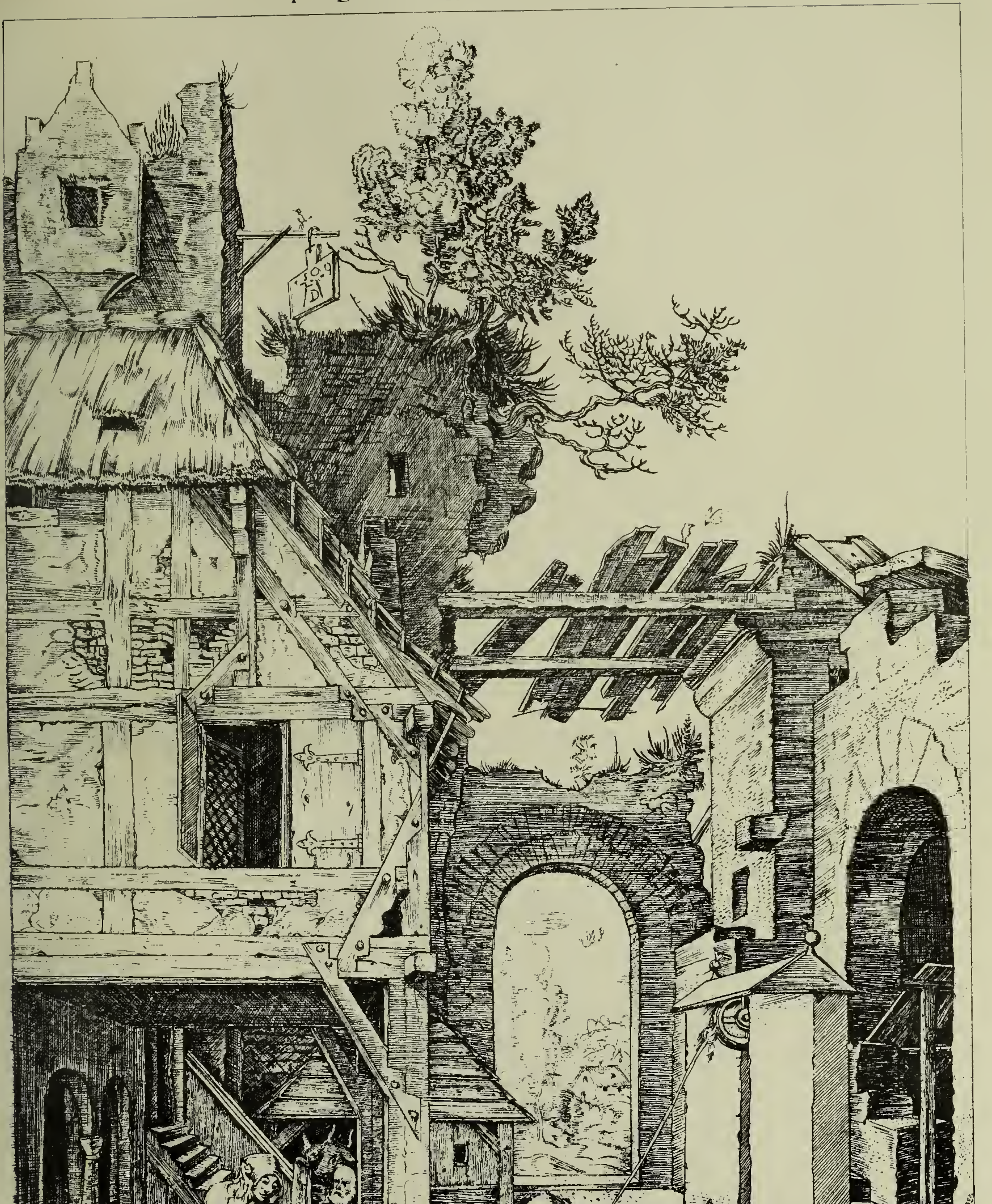
G. F. Bodley and T. Garner Architects.



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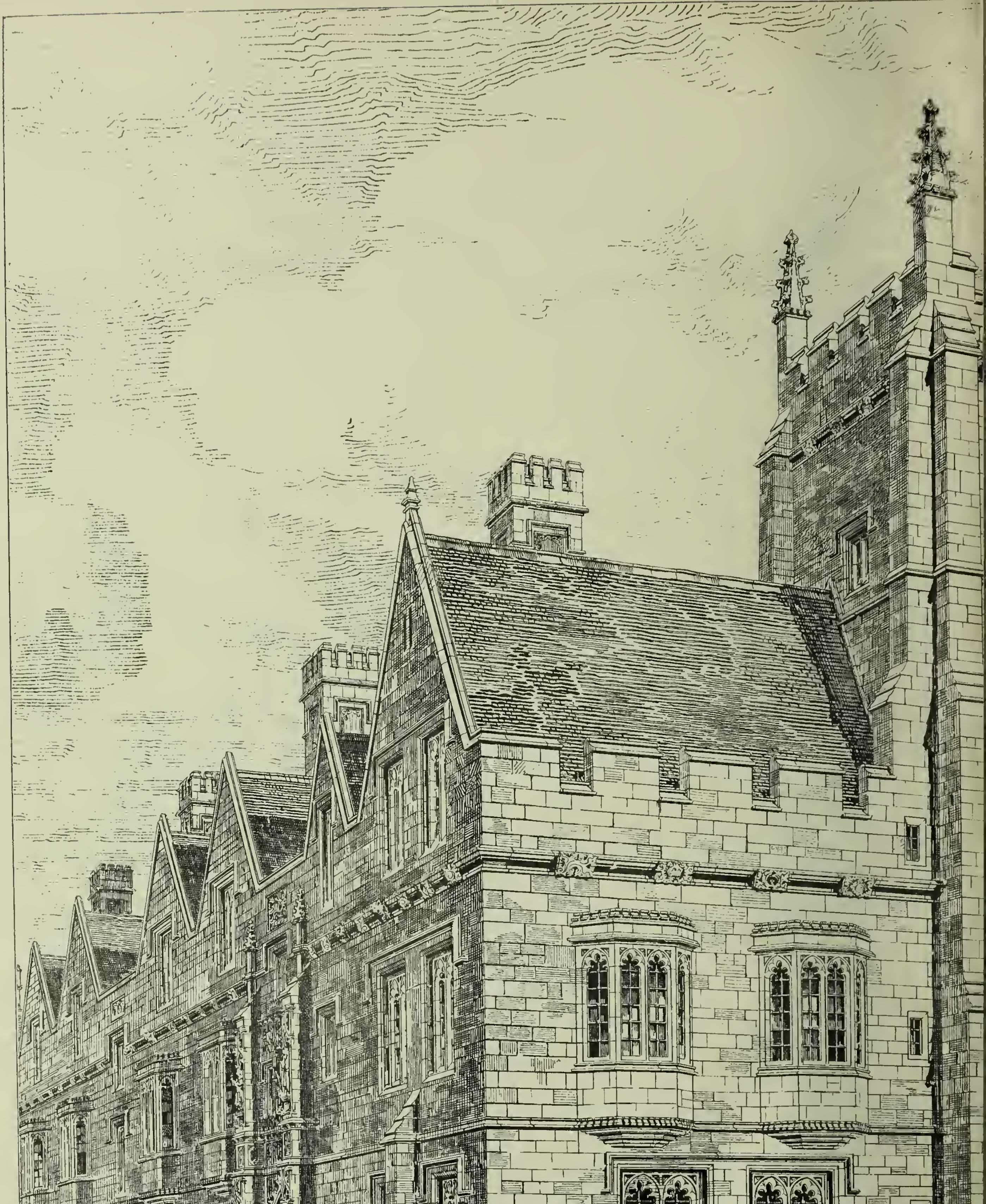
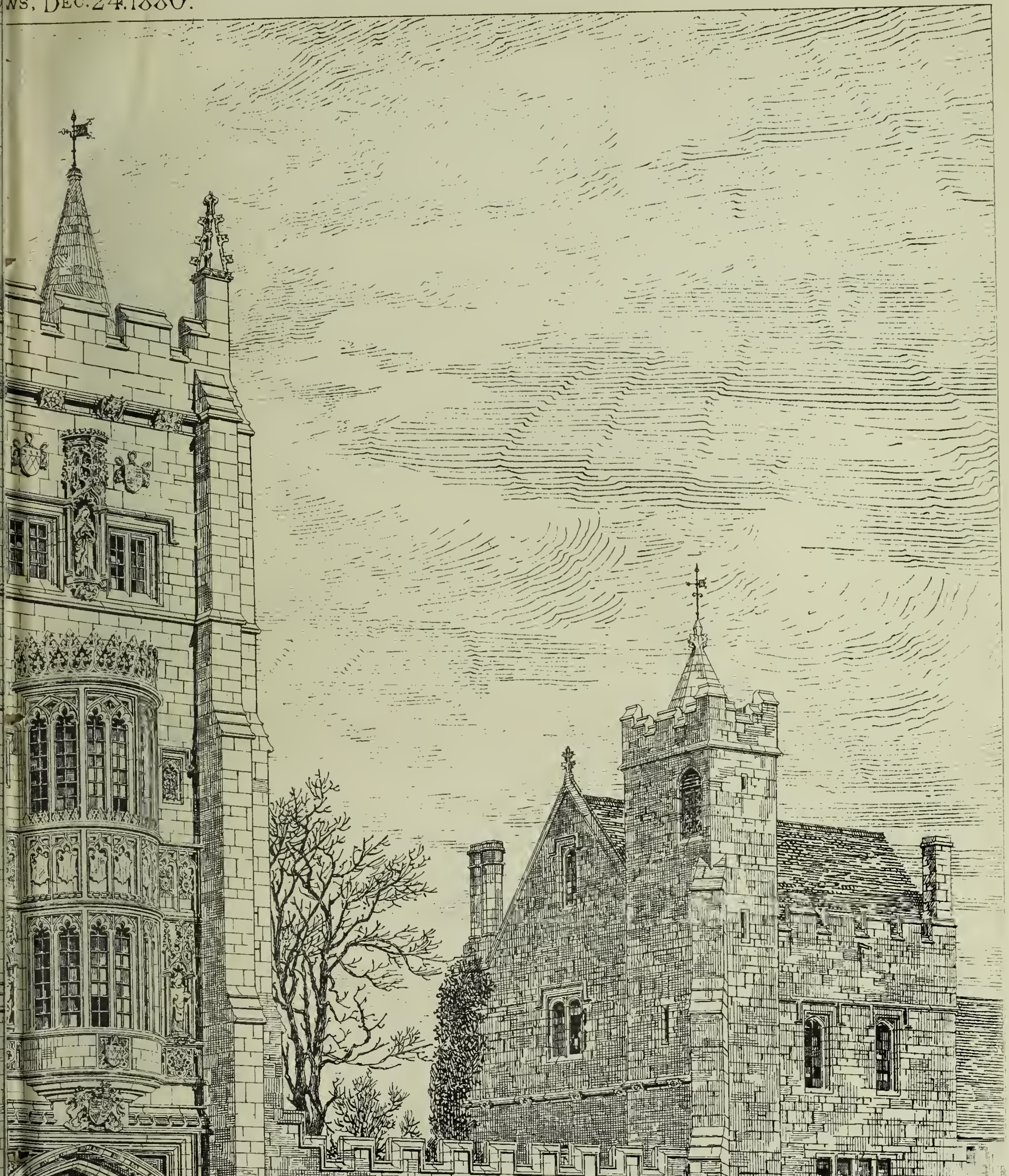
THE NATIVITY. BY ALBERT DÜRER.



S. MARY · MAGDALENE'S · COLLEGE · OXFO



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D) · New · Buildings · G·F·Bodley & T·Garner Architects

THE NATIVITY, BY ALBERT DÜRER.

[Illustrated.]

We, this week, reproduce on an enlarged scale a charming etching by this old German master. Our object in giving this illustration is to draw attention to the quaint details which enter into the constructive parts of the composition. The buildings on the right and in the rear appear to be the ruined portals of a town; that to the left is a half-timbered erection with the lower story, as was generally the case with all buildings rising above the level of cottages, a store place or shed for cattle. Here we have the side of this lower apartment removed in true Mediæval fashion to enable the artist to depict the incidents passing in the interior. The Virgin is shown clad in the conventional drapery that was, down to Dürer's time, an appendage of German art. St. Joseph is shown filling a vessel with water from a draw-well of the period, and from being represented in Christian art as an old man with a staff, the figure in the rear may be intended to represent the same saint in another capacity. The front portion of the building is shown supported on pillars or posts of squared timber formed of two pieces as thicknesses, and the rear portion on a stone wall. The framing of the building is made in three separate heights, each apparently perfect in itself; the upper stories no doubt being framed on the ground prior to being fixed in position. The timbers are all squared, and the braces are notched and dove-tailed at every available point and sunk in flush with the framing, where they are secured with pins or tree-nails. The walling or filling in is of brick, the uprights no doubt being grooved to secure the same, the whole being roughly drawn or plastered on completion. The window is of the first order of size for that period, and shows one of the movable casements or lead lights opening on the inside, and the shutters, the forerunners of these luxuries, opening on the outside. The roof covering is reeds or straw, held in position along the gable with thatch-pegs. The eave is strongly tilted, and here the lowest peg is shown continuing down to the main framing of the wall. The apex of the gable is cut back and covered in like manner, and from the openings in the same we may infer it was used, as is still the custom in Germany, as a loft or store-room. The ridging is composed of tubes of plaited straw, not unlike the straw cases or covers of our wine bottles. Albert Dürer, as an artist, was a careful observer of all around him, and we may accept every detail he here furnishes as being authentic and peculiar to the close of the fifteenth century. Away from the interest of Dürer's etchings as works of art, and as the earliest illustrations following upon the great invention of printing, they are valuable to those practising the constructive arts, as they furnish quaint and practical details of a bygone age that can only reach us in this pleasing form. For the loan of the original from which this enlargement is made, we are indebted to Mr. W. Stevenson, of Hull.

◆

PROPOSED NEW R. C. CATHEDRAL, HONG KONG.

[With Photo-litho Illustration.]

This design has been prepared in consequence of the old cathedral church having become unsuitable for the growing congregation. A new site has been obtained at the junction of the Caint and Arbuthnot-roads, on which it is proposed erecting this new cathedral, with presbytery and palace immediately adjoining. The ground is somewhat restricted in area, and has besides the disadvantage of being on a rapid slope, rising at the north-west corner to the height of 46ft. above the general level of the ground, but this is no uncommon feature in this neighbourhood, where the adjoining hills attain an altitude of 1,800ft. at a distance of less than 2 miles from the beach. The church has nave 28ft. wide with side aisles, together 64ft. wide, double transepts, chancel containing the high altar, and sanctuary with ambulatory running around the apse for processions, four small chapels for special devotional purposes, baptistery and tower. The latter will contain a complete chime of bells, and is not made lofty in outline on account of the ground immediately adjoining rising high above it. The sacristy communicates directly with the presbytery. An external passage way for religious processions runs all around the entire edifice quite open to the sky, except at certain parts where, by means of easy gradients, it passes under the east chapels forming short groined cloisters. The total length of the church is 206ft. internally, and the entire width across the transepts is 80ft. With the assistance of three large galleries, sitting accommodation has been obtained for about 2,000 persons. The two side galleries in the transepts will each hold a fine organ, the congregation being fond of cultivating highly musical accompaniments in their religious services. There are three public entrances, the principal one of course being at the end of the nave, the one from Caint-road is on a level with the gallery, and the other has a tunnel entrance from Arbuthnot-road, being below the level of the floor of the church. There are also special entrances to the sacristy. It may be as well to notice that the traffic in the city is chiefly pedestrian. In the construction of the building great strength will be required on account of the terrible typhoon which occasionally devastates the coast. Cross arches will span the aisles, forming concealed flying buttresses, and besides which all important arches will be strengthened by strong iron ties. The great heat of the summer months render it desirable to screen the walls as much as possible from the direct rays of the sun. This, for the present, will be effected by bamboo verandahs. The roofs are open but double in construction, and will be covered with the well-known Chinese red tiles, with large roll laps very bold and effective. The windows are narrow, and will be fitted up with louvre arrangement of glazing. A network of passages will be constructed under the floor of the church, which will enable air to pass through gratings in the floor. It will be noticed the design is Gothic of rather Early character. The main construction will be simple in detail, it being necessary to omit much of the more expensive or architectural details for the present on the score of economy. For instance, it is proposed moulding the arches hereafter, constructing them at first quite square and plain in sectional outline. The materials used will be local or Canton bricks; dressings of doors and windows will be of granite, with certain ornamental parts of free-stone, marble, or terra-cotta. The timber principally used will be Manilla. Native labour is cheap, but uncultivated, especially in matters of architectural finish. Altogether, the cost of the building when finished will not exceed £13,500, although it would cost much more than double that sum in England. The design has been prepared by Mr. John Crawley, architect and surveyor, 2, Bloomsbury-square, London, and the works will be carried out under the superintendence of a professional gentleman resident in the colony.

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THE "BUILDING NEWS" DESIGNING CLUB.

REVIEW OF DESIGNS FOR A CHAPEL TO A PUBLIC SCHOOL.

In proposing this subject, we had in view a building to be used for worship, attached to a college, or connected with it by a corridor or otherwise; but the majority of our competitors have conceived it as a structure having all the characteristics and accompaniments of a church. Many of the designs show small parish churches, with the addition of transepts, towers, and even spires. As external design, as well as good plan, was the object we had in view, we are obliged to accord to "Black and White," the first place. The plan of the author is a plain parallelogram, comprising vestibule, a nave, choir, and square-ended chancel, without any break in the walls, which is quite unnecessary for a building of this class; the more simple it is, consistent with dignity, the better. The only break is a slight organ-recess on the south side of the choir. The nave accommodates 80, the choir 22, and the gallery over vestibule at west end 18, making a total of 120. The vestibule terminates at one end as an octagon stair turret to the gallery, and this is carried up to just above the roof, which is of flat pitch. As regards the seating, it was not necessary to have the usual cross seats in the nave; a much better arrangement would have been benches placed lengthwise along the walls on each side, without the choir as a distinct part, and with the masters' desks or stalls arranged at one end, so that they could obtain a view of the whole of the students who would of course form the choir. The chancel might have been shortened and occupied by the altar, and a lectern placed between the rows of seats, which might have been in two or three groups and slightly raised at the back. A gallery over the end for visitors is a good feature. The exterior treatment of "Black and White" is pleasing; there are four bays, each having a square-headed mullioned window placed a good height above the ground, and these bays are divided by buttresses, which are carried up to form low pinnacles above the parapet. A piquantly finished bell gable is introduced over the head of the buttress between the choir and chancel. The style is Late Fifteenth Century Gothic, treated with much freedom broadly handled in the main, and with a nice doorway. (2) "Clarior e Tenebris" is also simply treated as a parallelogram, the walls running through without breaks. There is a corridor entrance shown from the college buildings on the south side, and a small stair turret to a gallery at the west end. The nave seats are disposed in the same manner as the last, and our remarks will apply to this also. The chancel is simply planned, choir seats are arranged on each side with a lectern on the north side, and a pulpit on the other. It is the treatment that we chiefly commend: the style is Late Gothic, and the only features are the low octagon turret at one end, and a plainly treated side finished with buttress heads of a Renaissance type and a good parapet. The structure has the merit of being characteristic. (3) "Veronese," is of an earlier type of Gothic with a high pitched-roof, and apsidal end, the bays being pierced by a series of lancet windows of the same size. A groined corridor at the west end in the axis of the chapel leads from the school to the chapel; there are two turrets for stairs to an end gallery, and an organ recess on the north side of choir, with a semi-octagonal end, for the altar. Here again the choir-seating might have been done away with, and the nave seated with longitudinal stalls and benches. There are simplicity and character in the details and the apsidal end and turrets are well treated. Though in style rather mechanical, and a little too pretentious. and costly, (4) "Sursum Corda" has the merit of a good plan. It is a long unbroken parallelogram of six bays with three groups of benches arranged choirwise, and a well proportioned chancel end. At the west end is a staircase lobby on one side leading to gallery, and a small vestry, though the last is unnecessary, as the officiating clergy could robe in their own room. Seats for the masters are not shown at the west end, but the lectern is in a good position. The drawings, though unfinished, are very neatly executed, but the details are of a type we can hardly call good. There is a bell gable at the west end. (5) "Frank" has scarcely realised the idea of a chapel to a public school; we might take his design to be an Episcopal or Congregational chapel. The corner turret and spirelet are commonplace, though the details of west end and flank are well drawn. In the plan there is a south cloister approach with turret stair to an end gallery. The seats are placed in the ordinary way, and there is a choir for 10 in each side and an organ-chamber. The chancel is square-ended. The total accommodation is for 140. (6, "Nitor.") The author of this sketch—it is hardly finished enough to call it complete as a drawing—has the right idea; the sketch shows a plain span-roofed building in the rear of school buildings, communicating therewith by a corridor. The proportion of plan is good; there is a gallery at west end and a plain, square-ended chancel rather differently treated externally by the windows, and lighted in the gable end by a wide, flat-pointed Perpendicular window. The bays to nave are only two, and these are lighted by square-headed mullioned windows. There is an unpretentious yet effective handling in the design, but the seating is not shown at all. Very different in aim is the design "Lex" (7). This is a costly, dignified and pretending Perpendicular structure with a nave and deep chancel with low-pitched lead roofs. The chancel is rather reduced in width and also lower than the nave. There is a narthex, with gallery over, for the family and servants of the principal; a nave 39ft. by 25ft.; a deep choir 21ft. long with stalls and an organ-chamber projecting; besides the sanctuary. The seat of the master is on the south side between the nave and chancel arch. A bold bell-turret emphasises the separation of nave and chancel externally. The plan is very carefully finished and the details well drawn, but the design is too ambitious. (8) "Edgar." This design, though unfinished, is appropriate and dignified in character. It is, however, much too long and expensive in the windows for a small school chapel. The ante-chapel or narthex opening from the arcade on the north side is a good feature, and the octagon stair turret is well finished above and kept low in harmony with the low pitched roof. If the chancel had been omitted and the sanctuary had terminated the seated portion, a better-proportioned plan would have resulted. The benches are placed the right way and a good wide passage is provided up the centre. The only break is a small organ-chamber. Style is Late Perpendicular, and the north and east end elevations have plain, flat parapets of characteristic design. (9), "Fortes Fortuna Juvat." The author of this design shows, what we consider to be the correct arrangement of the seating; the benches are arranged lengthwise in two groups, and the master's seats are at the end so as to be able to command the pupils during service. The lectern, Litany, and prayer desks are in good positions; the chancel would have been preferably made of the same width as the nave of chapel; the separation not only adds to cost of roofing, but is less dignified as an arrangement. The entrance vestibule is clumsily planned; a gallery is provided over with an organ-chamber on one side just in front of it. Externally the design lacks character: the arcaded treatment of sides and gable is good, but the porch and details rather meagre. (We must request, in future, attention to our often repeated request that only one sheet of drawings be sent). (10) "Such a Dog" is a fairly good treatment with well-drawn details in Fifteenth-century Gothic; the plan is an unbroken parallelogram with one roof, the ridge being relieved by a small cupola at the junction of choir and nave. There is a small end gallery, nave, and choir, with an arched vestry and organ-chamber; the gallery and screen at west-end is a good feature. (11) "A Bundle of Rue," has more the appearance of a small village church than a school building. There is some good grouping and detail in the organ-chamber, vestry, and porch side, these three being covered by a continuation of the main roof as an aisle of three bays and divided from the nave by pillars and a screen. Two dormers are shown above. We do not approve of the seating, the surrounding aisle to the nave sittings is not economical, and the altar end is too shallow. The small timbered tower and spire seem out of place. (12) "Pupil J.," a better-arranged plan showing a side corridor approach, which is continued from entrance to vestry; the seats are put the right way, in four groups to seat the boys, and there is a gallery at the west-end. What spoils the design is the reduced chancel, and the broken exterior on the corridor side, which, in spite of some picturesqueness and good detail, impairs the dignity of the structure as a small building The section shows raised seats, a desirable arrangement for a collegiate chapel. The perspective is rather roughly drawn.

"Epergos" is also one of those who adopt a sensible arrangement, making the chapel, in fact, an adjunct to the school buildings, and divesting it of any unnecessary appendages such as chancel arches, towers, and spires. The style is Perpendicular, with a well-treated west end, and an external difference is made in the chancel by the introduction of small windows. "Quid" has also the right notion of plan, but the seats would be better the other way, and the porch, lobby, and vestry are rather cramped. The elevations are suitable in the main. "Endymion" has an awkward roof over the west end higher than the main roofing, and the object is not very apparent. The plan and west elevation are suitable, and a connecting passage from the school is shown, leading by an outer cloister to the vestry. The altar is shown in a recess at the east-end, and a deep gallery is provided, approached by a turret stair. "Ephraim" has a good plan and an apsidal end, with fairly designed detail. "Alpha" sends a creditably-drawn design, but he has mistaken the intention. The plan and treatment he shows would do admirably for a small parish-church; there is a large tower at the west-end, clergy and choir vestries, and an organ-chamber, but there is nothing to indicate its adaptation for a school, and, according to the sketch, it is shown among trees. "Utile Dulci" also sends us a pleasing little structure well suited for a country district; even for that purpose, however, a more dignified arrangement would have been to have carried the walls and roof straight to include the chancel. The organ-chamber is unnecessarily large for a school chapel. "Howard's" design may be classed in the same category. The porch and side elevation are pretty, but there was no need of putting a lofty spirelet on the turret nor making the structure assume so independent a character, nor was a font desirable. "Rex" is simpler in elevations, but the design is spoilt by making the chancel a distinct building, and the choir arrangement is imperfect. "Motto A." goes in for an elaborate structure with one transept and apse. The seating in three rows is unnecessary, and the buttresses and pinnacles out of place. There is still some good detail that deserves recognition. "Yarra Yarra" has a better notion of plan, and has invested the chapel with a college-like appearance, but the lead flat, instead of roof covering, has an unsatisfactory effect. The bayed altar recess is not a bad feature, but the entrance end is very poor, while the arrangement of seats, &c., is not good, and the very elaborate Late Gothic chosen too costly.

Among cruciform churches, and therefore inadmissible, we must place "Black and White," "Hubert," York, all showing treatments that suggest isolated positions. "Ralph," like many more, shows a long nave with a separately-roofed chancel and a small turret at the west end; the latter arrangement and the porch have a cramped look, and the seats and sanctuary are not well planned. It would do better for a small church. "Beta" is picturesque in its half-timbered gable, but also uncharacteristic, and the altar recess is much too small. "Norman" has a better plan, but the small chancel and internal fittings are not good. "Ambition's" arrangement of altar and choir is cramped, and the elevations are not in a good style; "Dum Vivo Cantabo" is too parish-church like, and the lobby at end awkward; "Try," to do him credit, shows the connection with school building, by a covered corridor; but the chancel arrangement and stairs to gallery are faulty; while a similar remark, as to chancel and tower, applies to "Nil Desperandum." "Hope," though it suggests connection with school, does not show one, and the details are meagre and flimsy. Why the inner porch and huge projections for organ and vestry? We can only name a few others which have lost sight of the school altogether, and have shown ill-planned fittings. Of these we may note "B. J.," "Trial" (a better plan), "Ernest," "Labor Omnia vincit," "Sub judice." "Kismet," "Heart of Oak," "Con in circle," "H in circle," show corridor approaches; but their architecture and interior arrangements are of a kind not suitable; while Hexagon in circle sends a small church with two stories of windows; and "Ogmore," whom we are glad to see again, an arrangement of seats, with a monitor's seat at intervals dividing the sittings, but the external treatment, especially the crocketed windows, is not characteristic.

A CABINET FOR BOOKS AND CHINA.

In this competition, "Jack" takes the lead. His treatment is simple; the books occupy one-half of the upper part of cabinet, and the china the other; the first has curtains, and the latter is glazed. Below is a tier of lockers and drawers, and the whole stands on turned legs. Another arrangement shows china placed at the top, and lockers and drawers below, with cupboard and open space instead of legs as a stand. The mouldings show some refinement. White metal hinges are proposed. "P. E. R." is also a clever arrangement, Renaissance in character; the centre portion of top, curtained off, is intended for books; and two narrow side glass-fronted cupboards, finished with ornamental pediments, are given to the china. Below are nest holes for larger china, and glazed cupboards under the top. The drawings scarcely do justice to the design. "Reginald" is a quaint old English piece of furniture, with a deep flat ovolo between the shelves and lower stand, which last has a slight spraddle. The spaces for china are below the book shelves. "Walter" sends an elaborate design, with a centre cupboard with lead lights, and side lockers decorated with stamped leather. Below the top are drawers and lockers, and a shelf for large vases near the ground. There is a railed top for china also above the cabinet. An Anglo-Japanese feeling pervades the detail, and the design lacks simplicity. "G. W. W." shows the books arranged in a sort of pedestal case below, and a splayed cupboard with angle shelves for china above a top which is level with dado moulding. This design has the merit of being quiet, and the mouldings are good. "Semper Paratus" is a neat and well-designed cabinet, with angle and top shelves for china, besides the table top. There is a small central cupboard for books, and the lower part is intended for large books. "Cui Bono" sends also a simple treatment, a bookcase with top for china, and large cupboards below. We hardly like the panelling, but the details are good. The painted panels are well drawn. "Peace" is too clever and elaborate; the open side struts and brackets are fussy without being useful, and the cabinet would have looked better without the top cupboards. The books in the lower part would be much exposed to dust and damage. It looks more of an escritoire. "Fidelis" is spoilt by the bracketed-out lockers in the upper part, and the author mixes up china and books rather confusedly. "W. in W." is simply a bookcase with china in the upper and books on the lower shelves. Details are poor. "Rex" has a well-drawn perspective; the sides are given to china, and the middle part to books. The design is rather hackneyed, and the details coarse. "Veritas Vincit" is a clever sketch, but the detail and ornament are not good enough. "Milverton" looks too much like a skeleton cottage pianoforte, and the details are over wrought. "En Avant" is much better and quieter in treatment, but the details are heavy. The outline and upper treatment are sensible. "Con in circle" is neat but too over-laboured, and the details are unsuitable. We can only mention in order of merit, "Black and White," "I will either make a shaft or bolt of it," "Fido in circle," "One of the Crowd," and "Peter."

ARCHITECTURAL ASSOCIATION.

THE fourth ordinary meeting of this Association was held on Friday evening, at 9, Conduit-street, W., the President, Mr. Ernest C. Lee, in the chair. The following gentlemen were elected as members:—Messrs. J. W. Cockrill, T. H. Maile, J. Kingswell Cole, Ernest Vincent Grove, W. Campbell Jones, Alex. North, Lionel Littlewood, C. W. Jackson, Spencer Ashton Pentecost, Albert E. Kingswell, Wm. Hodson, H. E. Trivett, Edward Guy Dawber, Earnest A. Mann, W. F. Sutton, Stephen P. Rees, F. P. Telfer, Frank Rudkin, A. C. Wissenden, J. Clunis, S. A. Edwards, William Weir, Chas. Mayne, H. Gordon, E. J. Pine, J. L. Robinson, W. J. Lander, Philip E. Mantell, Geo. W. Hatcher.

The President remarked that members would be glad to hear that Mr. John Salmon Quilter, who recently filled the chair, and whom they all deeply respected, had that day been elected by a large majority as district surveyor of East Streatham and Brixton—an announcement received with applause.

THE ARCHITECTURAL TREATMENT OF SMALL STAIRCASES.

Mr. Aston Webb read a paper on this subject, which will be found, together with many of the plans by which it was illustrated, on p. 728.

The President, in opening a discussion upon the paper, remarked that Mr. Webb had brought before them, in a very interesting and practical manner, a problem with which they all had constantly to deal with. He could not agree with him in the matter of placing a strip of white drugget in the centre of the tread; it soon became dirty, and the painted margins looked worn. The whole surface of the stair should be treated in the same manner. He had expected that the author would have referred to the external stairs so numerous in Caen and other towns of Normany, in houses of the 15th and 16th centuries; the stairs were brought out, the doorway being formed beneath them, and formed interesting features of the buildings. One very noted staircase, that at Syracuse, had been drawn for the Architectural Association Sketchbook, by Mr. Chas. Eastlake, and was a charming specimen of how such a feature could be treated architecturally. Viollet-le-Duc had shown that in the 15th century it was the custom with French architects of large buildings to enclose the staircase in a wing or tower, and to project this from the centre of the front, as at the Louvre, at the Chateau at Blois, and in many parts of Normandy. In many cases even small staircases of that period, as in the well-known example at Orleans, only 3ft. wide, the handrail and newel were solid and well carved; of course, such a treatment would be too expensive for modern work. Mr. Webb did not appear to have noticed the very small staircases placed in good English houses of the time of the Georges. It seemed as if people lived then simply for show, and had little regard for domestic comfort or convenience. They met each other in grand reception-rooms, but they retired to their own bedrooms; they did not care how narrow, or dark, or poor the stairs were; they lived in private, in fact, in a hugger-mugger style. Often in large town mansions, as in Brook-street, and elsewhere, he had seen upper staircases of a kind modern architects would be ashamed to put into a parsonage, and the w.c.'s opened directly on to them. In a large country mansion he had recently found a staircase but 3ft. wide, with 7½in. treads and 10in. risers. At Lancaster-gate was a very fine old specimen of a central staircase—5ft. wide, and well constructed, but, unfortunately, insufficiently lighted. Frequently landings had been recommended by Mr. Webb, but he had found that these were inconvenient and even dangerous if they were made too numerous; in an example he knew there were four steps and a landing repeated as many as ten times, and the result was that a stranger going up was likely to trip, and on coming down he was almost sure to fall. He could not coincide with the author's suggestion to place seats on landings. If they were put there it was a question whether any one would sit on them, but if flowers and plants were arranged there they would be seen. There remained the question what to do with the corners, and these, as in Queen Anne houses, might be occupied by little cupboards, in which choice china, glass, and similar knick-knacks could be displayed.

Mr. Thomas Porter said Mr. Webb in his excellent paper had dwelt much on the position of the staircase, but as a matter of fact no general rule could be laid down. Each house must be planned to meet its site and size, and as a distinct problem. On one point he entirely differed from the lecturer, for he had told them that in some houses the stairs should be in a retired and inconspicuous place. It appeared to him that, by the abolition of the central hall, they had lost the spacious entrance of the Queen Anne dwelling, while they had retained the small stairs and upper parts of a house of that period. In planning the staircase, which was a portion of the house in constant use, he was disposed to make it a marked and conspicuous feature, and not to grudge the expenditure of a fair sum in its treatment. Plenty of ventilation was highly important, and a good staircase afforded one of the best means of obtaining this. At the same time, care should be taken in arranging it to avoid, as far as possible, waste of space in passages and corridors. In looking over Mr. Webb's exhibited plans, while he considered several of them very useful, he noticed one, No. 12, which he regarded as objectionable, particularly on account of the step shown upon the landing. People did not expect to have a step there, and so were sure to trip over it. He once lived at Portsmouth, in a house having a top step 2in. less than the others, and during the whole period he was there he always stumbled over this exceptional tread. He knew the example of an elliptically set-out staircase in Queen Anne's-gate which had been illustrated, and considered it very comfortable, while quite original in treatment. It was, however, 5ft. wide, and however suitable for adoption in a mansion, it would be impracticable in a small dwelling or a villa. He objected to one device Mr. Webb had advocated and shown on plan, that of turning the staircase the wrong way, resting against the front wall of house. One great defect was that it necessarily brought the w.c. against the centre of front wall. Farther than this, there could be no basement to such a house, (Mr. Webb: I explained that the plan was for a house having no basements), and would not admit of a sufficient landing. In the planning of treads and risers lay all the difference between the comfort or discomfort that would be experienced by those who had to use them in daily life. Addressing the junior members of the profession, he should advise them not to be led away by the notion that if they provided a 9in. tread they must also have a 7in. riser. His own experience was that a 10in. tread was the most comfortable, and that a riser should never be higher than 6in. Unnecessary landings were only an inconvenience. The flights of steps at either end of Trafalgar-square had been much praised by writers, and declared to be perfect; but, as a fact, they were very uncomfortable ones to use. He would next refer to the treatment of staircases. Many architects were in danger of being too fussy in their details, and made their small staircase much too heavy and elaborate in their mouldings. It was absurd to put a 6in. newel and a 3in. rail into a small house. He held in his hand a specimen of a prize design from one of the building papers—he hoped there were not many competitors for this £1,200 villa, if such a design carried off the prize. It had a staircase 3ft. wide, with newel 6in. wide, and of a most elaborate character; the balusters were 3in. wide, and not turned, but double-bellied like stone; and the hand-rail was 6in. deep and 4in. wide, and could never be executed in joinery. He considered the usual height of the hand-rail from the tread, about 3ft., was too great. He should recommend that in small stairs the height should not exceed 2ft. 5in. for the rake and 2ft. 9in. on landings, to be comfortable for ladies. Since he once tried these dimensions as an experiment, he had always adopted them in his own practice. Balusters should be designed of such an outline as to be readily turned in the lathe, and it was undesirable to cut the string-course. Wainscot was much the best material to work in, especially for twisted work, for which pitch-pine was quite unsuitable. Wood should not be introduced for cornices and soffits, or the whole staircase and well would appear too "boxy."

Mr. Cole Adams showed on the blackboard a mode which he had recently seen adopted for avoiding the difficulty of a steep descent, where little space could be obtained, viz., the device of scooping out one half of each step, so as to obtain two levels on every tread. In speculative builders he had noticed another dodge for lessening the cost of dilapidations which seemed worth attention. It consisted in cutting two treads from a plank on the slant, and turning both the feather edges inside, so that the nosings were the stoutest part of the material. He concluded by proposing a vote of thanks to Mr. Webb for his instructive paper.

Mr. S. F. Clarkson said Mr. Webb had not insisted on what he regarded as a perfectly legitimate device in a small house, namely, on the advisability of proportioning the staircase so as to increase the width of headway in every flight upwards. He, like the President, objected to Mr. Webb's recommendation, which had been backed by Mr. Porter, that the soffit, cornice, &c., should be formed of plaster. The staircase was, or ought to be, one of the most carefully-prepared portions of the joinery, and was made of the most fully-seasoned timber employed. Now, if a plaster soffit were applied to it, the chances were that the wet mass would tend to warp and dislocate the joinery. For this reason, wood was a better material for these adjuncts. He feared the author of the paper had hardly considered the difficulty of covering them with carpet when he recommended the use of frequent half-landings. He differed from him on another point also, in his objection to central staircases. On the contrary, he believed that in the town-house of the future, in which there would be a comparatively limited frontage, the central method would be "the" treatment for a staircase. But this feature would, he anticipated, be contrived on something more resembling the American plan than we were now accustomed to. Each pair of houses would be treated together with a central staircase, divided by a glass screen, and thus more light and better ventilation would be given to the middle of the block, and all the best rooms could be placed upon the frontage with as little loss of space as possible. Unless there was some reason for obscuring the view—something which ought not to be seen, an architect should not stain the staircase glazing; but in this matter one was frequently compelled to give way to the wishes of the occupier, who often preferred the conventional treatment. An instance occurred in his own practice where he designed and saw executed a window, in which, while the lower part was obscured, he had provided a distinctly-marked and broad transom, above which was clear glass. On visiting the house after it was occupied, he found all the upper part of the windows had been filled with obscure glass, and his client explained that the lady of the house had been chaffed by her friends that there was not sufficient money to complete the windows, and so had been obliged to alter it. Twisted balusters were frequently and loudly condemned, but there was a good reason for their employment, namely, that they enabled the eye to glide imperceptibly from one series of three balusters on a tread to the next three, whereas, if they were simply turned, the difference between rake of handrail above, and the series of sets of three balusters below, produced a jostling effect. He could not resume his seat without seconding the vote of thanks to Mr. Webb for his very original paper, which was a fitting successor to the equally-practical one on "Windows," read by the same author a few sessions since. Mr. Aston Webb had made a discovery—not perhaps a wonderful one in itself, since such papers *could* be written; but he had made the important discovery that *he* could write them, and was, therefore, entitled to their hearty thanks.

The President then put the motion of thanks to the meeting, and it was carried by acclamation.

Mr. Aston Webb, in acknowledging it, observed that all the speakers had objected to his condemnation of the central hall and staircase treatment of the house plan; but notwithstanding that, he remained of the same opinion still. Too often a fine staircase was almost entirely useless, and occupied space which could be more sensibly disposed of in rooms. White drugget had been objected to by the President. It was entirely a matter of taste, and he had advocated the use of a narrow strip where oak was used, but had not proposed to use where the wood was painted and grained. He feared Mr. Porter was in error as to his figures in what he had said in favour of a lower handrail than was common. He should certainly recommend that it be measured and experimented upon before so low a rail was adopted. He recollected that at the Traveller's Club there was a very low handrail, and a man fell over it and was killed; and at the inquest there was some talk of bringing the architect up to answer a charge of manslaughter. Mr. Cole Adams's feather-edged method of cutting two treads from a plank had been often tried, but he did not think much of it, and it certainly did not prevent wear of tread, and the consequent claim for dilapidations at the end of a lease. He quite agreed with the suggestion of Mr. Clarkson, to increase the height at the first floor.

The next meeting of the Association will be held on January 7th, when Mr. C. R. Pink, hon. secretary of the Excursion sub-committee, will read a paper, entitled "A Week in Norfolk."

THE CHEMISTRY OF SEWAGE PRECIPITATION.

A PAPER on this subject was read by Dr. W. Wallace before the Glasgow Philosophical Society, on Monday week. He premised that the mixed composition of sewage constituted one of the great difficulties in disposing of it, and the practical question turned on how sewage could be got rid of in the most convenient, least injurious, and least expensive manner. He then described the treatment of sewage by precipitation, as carried out in a number of English towns, including Leicester, Birmingham, Leeds, Bradford, Bolton, Windsor, Coventry, and Aylesbury. Purification by chemical treatment had, he remarked, been much misunderstood, and, consequently, discredited because it had not done all that had been claimed for it. Some had been inclined to regard it as a failure, and unworthy of consideration. The hope, no doubt, of making a profit by the sale of the precipitate or sludge must be abandoned, as experience had shown that it was not likely to be realised, but that was no reason why the process should not be adopted for the purification of sewage. He expressed the opinion that of all the substances proposed as precipitates the one that appeared to be most capable of general application was lime, and passing on to speak of the system of precipitation which it was desirable to adopt in the case of Glasgow, said he did not consider it imperative that this point should be settled before proceeding with the works. For both systems, that using lime and that in which sulphate of ammonia with or without lime was employed, the same tanks, apparatus, and filtering beds were required, the only difference being that when the latter process was used, the filtering beds did not require to be quite so extensive as when lime was adopted as the precipitant. Glasgow was well situated for both processes; lime of the finest quality could be had at from 12s. to 14s. per ton, and, probably, from the dilute nature of the sewage, 15 cwt. per million gallons would suffice. On the other hand, sulphate of ammonia, containing also some sulphate of iron, could be made in the district from the waste shale of the coalfields at a very low price, and the use of this precipitant would keep down the quantity of sludge. The disposal of this substance was one of the most important considerations in the establishment of sewage-precipitation works. There was a vast quantity of waste land on both sides of the river which might be reclaimed and rendered valuable by means of the sludge, and he saw no reason why the sludge should not be sent off to considerable distances by railway, as was done at present with the town refuse, to enhance the value of arable land. By having several precipitation works, facilities would be given for conveying the sludge in various directions. Whatever system of precipitation was adopted, the disposal of the sludge was one of the most important elements in the calculation of cost. He had estimated that the sewage of Glasgow—40 to 70 millions of gallons daily—would produce a quantity of sludge which, in the dried state, would amount daily to 135 tons; but as it must be dealt with in its worst condition, it would be a fair estimate to take five times this, or 675 tons, as the quantity to be daily got rid of. If lime alone were used as the precipitant, an average of about 40 tons would be required daily, which at 12s. per ton, would cost £24 per day, or £8,760 per annum. The total cost of working the precipitation process, not including interest on works, would probably amount to somewhere about £25,000 per annum. The question whether the effluent from precipitation would putrefy and cause a nuisance, after mixing with a considerable proportion of clean river water, was one which had engaged his attention, and the results of a number of experiments he had made during the past year, proved to him that Glasgow sewage, properly defecated and introduced into the Clyde at a point below the city, would not under any circumstances give rise to a nuisance. In regard to whether lime or alumina was the more effective agent for precipitation, his observations appeared to indicate that although alumina produced a somewhat more satisfactory effluent, the advantages attained by its use were not sufficient to compensate for the greatly increased cost of purification which might be set down at about four times that of lime. If, however, a very cheap variety of sulphate of alumina, with some sulphate of iron could be obtained, or if the liquor got by lixiviating calcined alum shale was available; if, in fact, the cost of alumina or a mixture of alumina and oxide of iron could be approximated to that of lime, he should have no hesitation in recommending its use in preference to lime. Dr. Wallace concluded by referring to an ingenious system for the purification of sewage and the utilisation of one of its constituents, invented by Mr. Peter Spence, of the Pendleton Alum Works, Manchester, and added that a process for the extremely rapid oxidation of the effluent from precipitation of lime or alumina, by which it would be rendered entirely innocuous before being discharged into the river, and that at a trifling cost, had been brought before him. He was not at present at liberty to disclose the name of the inventor, or the details of the process, but he trusted it would be brought before the Philosophical Society by the inventor during the present session.

THE TOWERS OF WIMBORNE MINSTER.

A VESTRY-MEETING was held at Wimborne, Dorset, on Tuesday week, to consider a report made on the condition of the Minster towers, by Mr. Ewan Christian, the architect employed to survey them, on the recommendation of the late Mr. Thomas Henry Wyatt, who was the architect during the restoration of the Minster. Mr. Christian stated that his attention was first directed to the lower portion of the north-east pier of the central tower, which was fractured on the east face. The fracture was somewhat serious, as indicative of disruption in the body of the pier, but the masonry all round was so good and sound that he did not think any immediate danger was to be apprehended. He suggested that the crack should be carefully watched for the slightest movement, and added that it would not be a difficult matter, with efficient shoring, to make good the defective masonry. As to the upper portion of this tower, and more especially its western face and parapets, he did not think that repairs could, with safety, be much longer delayed. The western parapet had long been in an unsafe state, and was now supported by props, but it urgently needed rebuilding; and the parapets on the other sides of the tower also required repair. A still more pressing matter was the repair of the arcading in the bell-story, notably on the west side, but in a lesser degree on the east. The repair of this work could not be, with safety, much longer delayed, but without examination from a scaffold it would be impossible to say how far it must extend. He should advise doing the least possible, consistently with making thoroughly sound work; but it was essentially necessary that further decay should be arrested by stopping out the wet and making solid all stonework at present more or less decayed. This could only be properly done under direction, and by very careful and experienced masons. As regarded the parapets, though the detail was coarse, and not strictly in keeping with the tower, he deprecated any change of form or the removal of any but unsound or really perished stones; but excepting the pinnacles, the greater part of the masonry would undoubtedly have to be reset to make sound work. To the western tower, a very great amount of work was needed, but this would be chiefly surface work, and the restoration of the bell-chamber windows. The tower was not, he remarked, a very well-constructed one, but there was nothing in the present condition to give cause for alarm. The external repair should not, however, be delayed longer than necessity required, and wherever there was a risk of penetration of wet into the interior of the walls, it was absolutely necessary that it should be excluded by stopping with Portland cement.

The report of Mr. Christian was adopted, and it was also decided to obtain approximate estimates of the cost of carrying out the whole of the repairs recommended, and the cost of thoroughly repairing both towers.

SCARBOROUGH HARBOUR.

EXTENSIVE works of improvements and extension have just been completed at Scarborough Harbour, from the designs of Mr. John Howkins, M. Inst. C.E., of Edinburgh. They have been carried out under the superintendence of the resident engineer to the commissioners, Mr. R. S. Wild, Assoc. Inst. C.E. The works, which were begun as far back as March, 1879, have included the excavation of a considerable portion of both the outer and inner harbours to a depth of 14ft. below high water ordinary spring tides, and the greater part of the remaining area to a depth of 12ft. below high-water ordinary spring tides; at the same time the piers have been lengthened, widened, and rebuilt. The material removed from the bed of the harbour consisted of sand and boulders in great numbers, the work being done by dredging, by hand labour, and by steam cranes, filling barges which were towed out to sea and their contents discharged into deep water. Part of the excavation was removed in waggons drawn up the slipway and tilted into the sea at the foot of the Castle Hill, from which place the sand was washed away quite free of the harbour. The outer harbour has an area of 5½ acres, and has been deepened by an average depth of about 3½ feet; in some parts over 5ft. of earth has been removed. The inner harbour has an area of 9 acres, and has been deepened by an average depth of about 4ft. The old dolphins, which occupied a large area in both harbours, have been removed and 13 mooring buoys, have been substituted. These buoys are attached to large concrete blocks, sunk to a considerable depth below the new bottom of the harbours. The quay walls of Vincent's Pier, having been undermined in the process of deepening the harbour, have been underpinned, an operation of considerable difficulty. The West Pier, which had a length of 500ft., and which was only 27ft. wide, has been lengthened and widened, and is now 740ft. long and 70ft. wide. This pier is formed of a face-wall of Portland cement concrete, built in position, and filled in behind with materials obtained from the harbours during the excavating process. The concrete wall is about 23ft. in height from foundation to cope, and is made of Portland cement concrete laid in blocks consisting of Portland cement, from London, of the highest quality, and gravel got chiefly from Carnelian Bay in cobles, and also from the shore beyond the Spa. In some instances a mass of concrete, weighing about 300 tons, was made at one operation, and in no instance was any block made of less weight than about 100 tons. The old entrance between the former West Pier, and the Island Pier has been closed and replaced by a new one, 100ft. in width between Vincent's Pier and the circular head of the new pier, the Island Pier being entirely removed. The construction of the new pier was somewhat arduous, owing to the difficulty experienced in obtaining sufficient foundation. The red clay, common in the district, was found to lie at a depth of about 10 or 12ft. below the surface of the sand, and it was necessary to drive sheet piling into the clay to enable the wall to be properly founded. Fending piling has been driven along both sides of the pier to enable vessels to lie against the pier while loading or discharging goods. The surface of the pier is macadamised. The buoys have been supplied by Messrs. Alexander Shanks and Co., of London and Arbroath. The original estimate was about £13,000, but the total cost is expected to amount to between £16,000 and £17,000. The contract was taken by Mr. J. W. Morrison, of Edinburgh.

ALMANACS AND DIARIES.

MESSRS. HUDSON AND KEARNS have sent us their usual batch of diaries and patent blotting-pads for 1881. These have now become recognised necessities in architects' and builders' offices, and little recommendation is needed on our part. We may remind our readers that Nos. 11, 12, and 13 are those more especially suited to their requirements. Even if the distinctive useful features which these diaries possess were absent, they would be among the cheapest published at the prices. *The City Diary*, 1881 (London: W. H. and L. Collingridge), is published for the eighteenth time, and gives much information useful to City men, besides being a good cheap shilling diary. *The Railway Diary and Official Directory* (London: McCorquodale and Co.), will be found serviceable by all civil engineers and others doing business with the railway companies. *The Professional Pocket Book and Diary* (London: Rudall Carte and Co.), is intended for the musical profession.

COMPETITIONS.

Croydon Board Schools.—The School Board for Croydon recently invited plans in limited competition for a new school in the Sydenham-road, and from the ten designs submitted, that by Mr. Charles Bell, of Dashwood House, New Broad-street, has been selected for execution. The new schools will accommodate 750 children, at a cost of about £5,400.

Eastbourne.—We hear from the *Eastbourne Standard*, and other sources, that the local board of Eastbourne have decided to carry out the design of their own building surveyor, Mr. Schmidt, and have practically shelved the design which has been awarded the premium of £75, by Mr. Foulkes, of Birmingham. The new building is to cost only £5,000, just a fourth of the contemplated outlay. A writer in the *Eastbourne Standard* asks what circumstances have dictated this step, and reasonably inquires why competitors should have been invited, and a premium awarded. The design premiated could have been carried out in sections, and no economy seems to be gained by erecting a building that will be found insufficient in a few years.

Swindon.—In a limited competition for laying out and draining new cemetery, and erecting chapel, mortuary, care-taker's lodge, &c., the plans of Mr. W. H. Read, of Swindon, have been accepted by the Burial Board, and the works will shortly be commenced.

The Raikes Memorial Church.—The *Gloucester Journal* and the *Gloucester Chronicle* both published on the 16th inst. the following report of the sub-committee, who examined the plans in this competition: "We have received upwards of 40 sets of drawings in answer to our advertisement. Some of them are extremely good. The task that devolved upon us was a difficult and delicate one. A large church is absolutely needed for the rapidly pressing wants of the South Hamlet. It was proposed by the Lord Bishop of the Diocese and by the representative City and County Committee, that the most fitting memorial to the founder of Sunday Schools would be such a church. An appeal was made to the whole country, but the response to it has been disappointing. The greater part of the sum promised and received has been from local sources. It is obvious that although by adopting an economical style of architecture, and dispensing with unnecessary ornamentation, a church sufficiently large to accommodate the population may be provided, yet a distinctive and handsome church, worthy of being considered as a memorial of so important an event as the commencement of Sunday schools, could only be built at a great expense. The committee therefore were in this dilemma. A large church to accommodate 800 adults was required, but the sum at our disposal was small. We had spent £800 in the purchase of the site, and force of circumstances compelled us to fix on £4,500 as the sum to be spent on the church—exclusive of the spire or tower. After careful consideration of the plans, 13 were selected, including amongst them those of four local architects, and a sub-committee was appointed to report upon them. This sub-committee held several meetings, and carefully studied the respective merits of the 13 designs. They also obtained the assistance and advice of persons well versed both in church building and architecture, and received from them valuable and exhaustive reports. In addition to this the 40 sets of drawings have been re-examined, and the selection of the 13 has been ratified and approved. It was gratifying to discover a singular accord of testimony on the part of those who assisted the sub-committee with their advice. After taking all the circumstances into an anxious consideration we have adopted the design presented to us by Mr. Capel N. Tripp, and we bring it before you in the belief that a church built in accordance with these plans will meet the requirements of the South Hamlet." The selected design was also described in both the Gloucester newspapers already mentioned in precisely similar terms, as follows:—"The plan consists of nave and aisles, transepts and choir. The latter occupies one bay of the nave arcade, and is inclosed by a low stone screen, the sacrarium having merely the requisite space within the kneeling step. The organ chamber is placed on the south side of choir. Distinct vestries, with entrance lobby for clergy and choir, are conveniently situated, and means of ingress and egress for the general congregration are well provided for by three porches; that on the west being especially intended for exit. It is proposed to seat the church with open benches, accommodating 800 persons, those intended for children being placed on the north of the choir. The font is placed immediately under the west window. The style chosen is that of the plate-tracery period, which, from its simplicity and solidity, admits of the employment of either brick or stone in the construction as circumstances dictate, and with very trifling alteration in detail. Provision is made for a tower being built at some future time at the south-east of the nave without in any way affecting the interior of the church or its services, and a bell-cot towards the east end of the nave roof, forms part of the present design. The nave fittings are proposed to be executed in red deal, and those of the choir in selected pitch-pine, and the former material will be used for all exposed timbers in the roof, which will be covered with Broseley tiles. The aisles and other approaches and spaces will be paved with plain tiles, while the choir and sacrarium will receive more handsome treatment. The form of memorial suggested by the architect is the introduction of stained glass having special reference to the life of Robert Raikes, and a handsome reredos with a bas-relief of an appropriate nature. Every provision is made in the design for a system of ventilation and heating, and the form of roof adopted would, in all probability, render the acoustic properties of the church satisfactory. The interior treatment of the church will much depend upon circumstances and the materials employed, but there is every opportunity for future decoration, although the object of the architect has been to produce a town church of simple detail, and inexpensive materials, which shall depend for any effect it may possess upon the breadth of treatment and general properties."

SCHOOLS OF ART.

Cirencester.—The annual distribution of prizes gained by the students of this school took place at the town hall on Tuesday week. Mr. T. Gambier Parry, before giving the prizes, highly congratulated the students on having been awarded, in the national competition, so great a distinction as one of the ten gold medals offered by the Department, besides two silver and one bronze medal. He then delivered an address upon fine art. The gold medal was awarded to Francis Gibbons for a design for a pavement; the silver medals both fell to Alfred Hall for designs for treatment of side of ballroom (a design which had also won the Plasterers' Co.'s prize of 8 guineas), and for silver cup, and the bronze medal to Mr. B. Pratt for a pavement design. Ten third-grade prizes, one art master's certificate, and eight-second grade prizes were also gained by students in addition to ten certificates. The report of the committee showed that the school was in a satisfactory condition financially.

Derby.—On Monday evening Sir William Harcourt distributed the prizes won at the recent government examinations by students attending the Central School of Art, Green Hill, Derby. In the course of a brief subsequent address he expressed the pleasure he felt at finding that the school not only afforded amusement—though he did not undervalue that, because graceful amusement, such as the pursuit of art, was one of the graces and decorations of life,—but that it afforded also in machine drawings, geometry, and architecture an occupation which might be of the greatest value to pupils in their future career. Looking back fifty years he contemplated with horror the state of things which existed in his youth, and if some of the students who were present on that occasion could have seen the horse-hair sofas, the marine curtains, the carpets, the papers, the coal scuttles, and the fenders which prevailed half a century ago they would have been able to estimate the progress which we had made in art. He had that evening given prizes for wall decoration, which was in itself an indication of the progress made in the arts of life, and he was also glad to hear that fair advance was being made in the decorative art in plate, in which certainly of late years England had not been so distinguishable as she ought to have been. As showing what an advance had been made in these arts, he would ask them to compare the children's books of the past and of the present day.

Dorchester.—The annual meeting of the supporters of this school of art was held last week, Mr. W. A. Bankes in the chair. The treasurers' statement showed that the total receipt of fees had been £113 1s.—five guineas decrease on the previous year. The committee's report spoke of a diminution in the number of morning students, and stated that at the annual Government examinations 30 presented themselves, of whom 16 were successful against 12 last year, and six of these obtained prizes as compared with 2 in 1879. A number of local prizes were awarded to the students who passed as "excellent."

Dundee.—The thirteenth annual presentation of prizes and certificates at the Dundee School of Art took place on Friday night, the distribution being made by Earl Dalhousie. The results of the Government examination were reported to show a marked improvement in art upon those of last year, while those in science were about the same. In the former branch, 38 third-grade prizes, 2 silver medals, and 2 bronze medals were obtained, as against 23 third-grade prizes, and one bronze medal, last year. The number of students showed a satisfactory increase.

Newcastle-on-Tyne.—The presentation of prizes in connection with the Newcastle School of Art took place last week. The report of the committee stated:—The number of students who attended the school during the year has been 220, showing a decrease of 21 since last year. The annual Government examinations were held on the 22nd and 23rd of April, when 80 candidates were examined in one or more subjects of the second grade, viz., freehand drawing, model drawing, practical geometry, and linear perspective; 49 of these candidates were successful. The total number of papers worked was 114, 62 of which were successful, 17 being marked excellent and 2 good. The analysis of the examination stands thus.—

	Freehand.	Model Drawing.	Practical Geometry.	Perspective.
Examined	47	32	16	19
Passed	19	17	10	16
Prizes	2	3	4	8

11 full certificates have been granted.

Of the works executed in the school during the year, 187 students sent 2,028. Of these, 407 were in the advanced section, executed by 49 pupils; the remainder were elementary works, including shaded ornament from cast, outline from cast, outline of figure and ornament from copy, practical geometry, and linear perspective. Of the above students who sent work, 8 only in the advanced section of the evening class were considered by the examiners at South Kensington to have executed a full year's work satisfactorily, and 20 in the elementary section. One national book prize has been awarded, and eight third grade prizes at the national competition, five of which were for works in the advanced stages of painting and design. Free studentships were awarded to two students of the evening class who had submitted a sufficient quantity of good work. In the local competition twelve prizes were awarded.

CHIPS.

The local board of Sowerby-bridge proceeded on Wednesday week to the appointment of a gas manager. There were 76 candidates, from whom five had been selected by a committee. On being put to the vote, Mr. John Marsland, of Newry, was appointed, at a salary of £150 per annum; the second place being taken by Mr. G. W. Buckley, of Sheffield.

The annual distribution of prizes and certificates to students of the school of science and art at Stroud, Gloucestershire, took place on Thursday, the 16th inst. It was reported that in the art school there had been a steady increase of students' fees, Government grant, and also in the number of works sent to South Kensington, of which there were 442 in the past session. The chairman, Mr. Watts Hallcwell, on behalf of the students, presented two silver teapots to Mr. Broad, master of the art school.

A new breakwater has just been completed at the end of the High-street, Walton-on-the-Naze, in the hope of checking the inroads of the sea. It is formed of masonry and is 115ft. in length; the work has been executed under the superintendence of Mr. Goddard.

A new mission church and schools at Fishergate, near Brighton, were opened on Monday week. The buildings are constructed of red brick, with a sparing use of stone for dressings, and Mr. Arthur Loader, of Brighton, is the architect.

The local board of Goole are in treaty with the rivers Aire and Calder Navigation for the purchase of the local gas-works and undertaking from the Navigation.

The first meeting of a Public Sea-Water Baths Company, which proposes to establish baths at Lowestoft, and to which the Great Eastern Railway Co. has subscribed part of the capital, was held last week. Messrs. Clenence and Oldham Chambers have been appointed architects.

A "steeple-Jack" named Richard Noble, of Birmingham, was killed on Wednesday week whilst repairing a chimney stalk at Chance's glass-works, Spon-lane, West Bromwich. Deceased had inserted spikes in the chimney, to which ladders were affixed. When he had taken his position to commence work one of the spikes gave way, the ladder snapped, and Noble fell a distance of 90ft. to the ground.

The Court of Common Council of the city of London last week adopted a report of the markets' committee, recommending an expenditure of £12,000 for additional lairage accommodation for 550 beasts at the Foreign Cattle Market, Deptford. At the same meeting new duties were assigned to the two bridge masters, and their salaries were increased from £53 for the senior, and £33 for the junior master, to £250 and £200 respectively.

A stained glass window was last week placed in in the chancel of St. Mary's Church, Chard, Somersetshire, as a memorial of the late vicar. The window is Perpendicular in style, and has been executed by Messrs. Clayton and Bell, of London.

Building Intelligence.

Blackburn.—The church of St. Philip, Griffin, Blackburn, was consecrated on the 15th inst. It is a substantial structure of Early English character, built of local rubble masonry, and faced with Yorkshire parpoints, with tooled ashlar dressings. The roofs are open-timbered, covered externally with blue and purple slates. The plan comprises nave, 89ft. 6in. by 30ft., and 49ft. to ridge, with north and south aisles, 11ft. 6in. wide; chancel, same width as the nave, and 30ft. 9in. in length; two vestries for clergy and choir on the north side of chancel; organ-chamber on the south; a tower, 112ft. high, at west end of south aisle, and north porch. The aisles are laid with stone landings, and the chancel with ornamental tiles; the church is warmed by hot water; the nave and aisles are seated with open benches of pitch-pine, stained and varnished; the choir-seats, prayer-desk, and Communion-rail are of oak. The pulpit and font are of Bath and other stones, enriched with dark marble, and the lectern of polished brass. Accommodation is provided for 600 persons, and the total cost is about £8,000. The building has been carried out by Messrs. Stones and Sons, of Blackburn, contractors, from the designs, and under the superintendence of the architect, Mr. John Lowe, F.R.I.B.A., Manchester.

Brighouse.—The walls of a new silk-mill on the West Holme Estate are now up, and the roof is in course of construction. The rearing supper was held on Saturday night week. There were about 150 persons present, including Mr. Kershaw, the proprietor; Mr. George Hepworth, the architect; and the contractors—Mr. James Dyson, mason; Mr. Thomas Bottomley, joiner; Messrs. Mackrell and Exley, ironfounders, Elland; Messrs. Hill and Nelson, slaters, Bradford; Mr. William Brook, plumber and glazier; Mr. Joseph Wood, plasterer; and Mr. R. Mitchell, painter. The building is a four-story one, 66ft. high, the entire length being 300ft. 8in., and the width 49ft. 4in. The building is of stone from local quarries, and is the largest let in one contract at one time in Brighouse.

Derby.—The foundation-stone of new Trinity Church, Derby, was laid on Wednesday week. The church will consist of nave, north and south aisles, north transept, chancel, choir-aisles, and vestry. The nave will be 89ft. 1½in. long, and the chancel 34ft., so that the total length of the building will be 123ft. 1½in. The width of the nave will be 25ft., and the north and south aisles 18ft. 6in. each, while the total width at this portion of the church from wall to wall will be 67ft. 6in. The chancel will be 25ft. wide, and the north and south chancel-aisles each 14ft. with a total width between the walls of 58ft. 6in. The greatest width is where the transept will join the building, and there it will reach a span of 74ft. 6in. The accommodation provided will be for 911 persons. Externally the architecture will be of the 14th-century style, and the building will be surmounted by a spire and tower running up from the north-east corner, to a height of 200ft. The architect is Mr. J. O. Scott, and Mr. Burlison is acting as clerk of the works. The contract has been let to Messrs. Horsman and Co., of Wolverhampton, the amount being £17,100; but this sum is certain, it is said, to be exceeded.

Haltham.—The chancel of Haltham Church, near Horncastle, which had in the course of time fallen into a most dilapidated condition, has just been thoroughly restored. It was found necessary to take down and rebuild the south wall. Whilst doing this portion of the work, a two-light window and a priest's door, hitherto blocked up, have been reopened. A ceiling of plaster has been removed, and the chancel is now covered with an open roof of red Memel timber. Haltham Church consists of chancel, nave, and north aisle. It is much to be desired that the nave and aisle should also share in the work of renovation. Messrs. Jackson and Creasey, of Coningsby, have executed the restoration of the chancel.

Hanley.—The Congregational church having decided upon the erection of extensive new buildings in High-street, invited designs from the following architects—viz., John Sulman, London; William Sugden and Son, Leek; and C. O. Ellison, Liverpool. The committee have unanimously decided upon the plans of Messrs. Sugden and Son, and the works will be pushed on forthwith. The buildings will be in the Rectilinear Gothic style, and will be built of thin red local bricks with red Mansfield stone dressings. The following accommodation is provided: Chapel with galleries and transepts to seat about 1,000 people; lecture-hall to seat 200; tower and porches, narthex, organ-chambers, minister's and deacons' vestries, large schoolroom with about 20 class-rooms, teachers' social meeting-room, kitchen, scullery, and other conveniences. There is space left on the site for the future erection of additional class-rooms and a caretaker's house.

Leith.—A new church for the Free Church congregation of South Leith is about to be erected. The plans show a nave about 90ft. long, with clerestory, aisle, and transept; a session-house and offices being provided in a low building at one end of the church, while at the other end is placed a tower and spire, rising to the height of 130ft. The windows are Early Gothic lancets, grouped and proportioned to suit their several positions in the building. The church is to accommodate 850, including 100 provided for in a gallery at the end. The plans have been prepared by Messrs. Hardy and Wight, architects. It is estimated that the cost will be about £3,600.

Manchester.—The new building for the Nicholl's Hospital, Manchester, is nearly completed. It has been erected from plans prepared by Mr. T. Worthington, architect, of Manchester, and, exclusive of furniture, cost upwards of £20,000. The hospital is built principally of brick, with stone dressings and finishings. The style is Gothic, with square-headed windows, having stone mullions and transoms; there are also stone dormers on the top story, with gabled roofs at each end, and angle turrets. Over the entrance is corbelled out a bold oriel window, two stories in height, terminating at the top in a niche, and on each side of the principal entrance are other niches, in which it is proposed to place statues of the founder and two other members of his family. In the centre of the facade, and above the oriel window, a tower is placed, the summit of which is 130ft. high. The whole of the ground-floor is constructed on Dennett and Co.'s patent arching, and is fireproof.

Portsmouth.—The memorial-stone of a new Roman Catholic Church, now being erected in Edinburgh-street, Landport, was laid on Thursday, the 9th inst., by the Bishop of Southwark. The first section of the church now being built, at a cost of about £9,000, consists of five bays of the nave, with its side-aisles. When completely finished, the edifice will cost about £23,500, and will consist of nave with north and south aisles, transept, chancel, and side-chapels, with sacristy, and lofty tower and spire. The total length will be about 185ft., and the width of the nave and aisles together about 58ft. internally. The building is designed in the Geometrical style of the first half of the 14th century. The walls are of brick, faced with Southsea red bricks, the dressings of windows, doors, and internal arches are of Beer stone, from Seaton, Devonshire. The piers of the aisle arcades will be of Portland stone. The main parts will be finished with ornamental wooden vaulting, rising to the extreme height of 57ft. The chancel and chapel are intended to be groined in stone. The foundations have proved both difficult and costly, it being necessary in some parts to excavate to the depth of more than 20ft., and fill in with cement concrete, as the church is on the site of the fosse of the old fortifications. School-buildings, accommodating more than 600 children have been partly built in the rear of the site, fronting on to Alfred-road, at a cost of £4,500. The main building is two floors in height, and contains girls' and boys' schools, each about 64ft. by 23ft. The infants' school, as at present built, is 35ft. by 46ft. The class-rooms to each of the three schools will be added when funds allow. The presbytery, hereafter to be erected, will face the Edinburgh-road, and will directly communicate with the eastern end of the church by means of a close cloister. Six designs were originally sent in competition for these buildings, the successful architect being Mr. John Crawley, of Bloomsbury-square, W.C., who is now carrying out the works. The contractors are Messrs. Patman and Fotheringham, of Theobald's-road, London.

Roman Catholic Church Building Intelligence.—The Dominican Fathers have finished the entire roofing-in of their church at Haverstock-hill. It will be completed long before the period originally assigned for its construction. Several additions and improvements have lately taken place in many of our London churches. At the Pro-Cathedral a large figure of Our Blessed Lady, under a spiral canopy, was blessed by the Cardinal Archbishop on the 8th inst. On the evening of the same day his Eminence blessed a new Lady Chapel, in the Augustinian Church of St. Monica, at Hoxton. The church having very narrow aisles, the new chapel projects somewhat beyond the left aisle on the side of the chancel (to which it is attached by a double archway). The chapel is 20ft. in length by 15ft. in breadth, and was erected from the design of Mr. John Young, at a cost of £800. The new chapel of St. Joseph, in the Servite Church, has been decorated under the care of one of the Fathers. On the reredos are represented four events from the life of St. Joseph, painted in the Italian style.

Salisbury.—The Nelson coffee-house at Salisbury, which has been in course of erection for some time in Fisherton-street, was opened on Thursday week by Earl Nelson. The building is well planned, and contains about 30 rooms, including a very large club-room. A lift and a tramway have been made to minimise labour, and ventilating apparatus has been provided. The exterior is of a deep red tone, almost Pompeian in its style; full-coloured bricks with dark chocolate pointing have been employed, and the dressings (window arches, medallions, finials, &c.) are of terra-cottta, supplied by Messrs. Doulton, of Lambeth. The contractor for the whole of the works was Mr. Arthur Foley, of Fisherton, who also provided all the fittings and furniture. Mr. F. Bath, of Crown Chambers, Bridge-street, Salisbury, designed the building.

Scarborough.—The new Post-office in Huntriss-row, Scarborough, is expected to be ready for use in the early part of next year. It has been designed by Mr. James Williams, of Her Majesty's Office of Works, Whitehall, London. The front elevation is Classic in style, and up to the first-floor the material used is stone, and above the first-floor to the main cornice, red bricks and stone. The main cornice of stone is of a rich and massive character. There are two entrances from the street by stone doorways with coved and fluted jambs, and rich carved work. The staircase leading to the first floor is of stone, broad, and of easy ascent, and constructed of moulded spandrel steps, and lighted by a lantern. The basement contains the retiring and battery-rooms, at the rear of which are offices, lavatories, &c., for the use of the clerks and sorters. This basement suite of rooms, 10ft. in height, is reached by two sets of stone steps from the ground-floor, and the whole area excavated for the basement and offices measures 112ft. by 46ft. The ground-floor, in which the public business will be carried on, consists of the public office, a good room 40ft. long, and 23ft. 6in. wide, with a height of 17ft.; a mahogany counter runs the full length of this room. Behind is a sorting office, 54ft. 3in. long, by 27ft. wide, lighted by both side and lantern-lights. Adjoining is the postmaster's-room, 12ft. 6in. by 14ft. 6in. On the first-floor is the telegraph-instrument room, 23ft. by 32ft. 6in. and 15ft. 6in. high. The walls of lavatories, &c., on basement and first-floor are faced with Dutch tiles, and the disconnection system is adopted for the house-drainage. Mr. Weatherley, of York, is the contractor, and Mr. John Plows, his managing foreman, and Mr. Thomas Leake, clerk of works for the Government.

The Royal Victoria Coffee Music-Hall.—The Victoria Theatre has been leased by the Coffee Music-halls Company (Limited), who are opening it as a music-hall in which the refreshments will be non-alcoholic. It has undergone considerable structural changes: the front portion of the ground-floor being converted into a coffee-tavern, and the old walls, staircases, &c., formerly occupying that area, being removed. The main wall of front is now supported on iron girders and columns, and the portico inclosed with a tavern front in mahogany and plate-glass. Doorways have been enlarged and exits altered to meet the requirements of the Metropolitan Board of Works. Internally, the theatre has been newly-decorated throughout, new retiring-rooms have been arranged, new scenery painted, and the lighting arrangements improved. The gas cooking apparatus has been supplied by Mr. Fletcher, of Warrington. The works have been carried out by Mr. Holloway, of Lavender-hill, from designs by Mr. E. Hoole,

CHIPS.

A memorial window has just been placed in the examination-hall of Queen's College, Cork, as a memorial of the late Mr. Robert Harkness, F.R.S., who, until his death in 1878, filled the professor's chair of Geology in that college. It contains portraits of Linnæus, Cuvier, Werner, William Smith, Lyell, and Murchison, representing the sciences with which Professor Harkness's name is associated, and above are his armorial bearings and those of the College.

The town council of Carlisle decided last week to apply to the Local Government Board for leave to borrow the sum of £6,630 for the formation of new streets according to the report, estimates, and specifications of Mr. McKie, the city surveyor.

The parish-church of St. Mary Magdalen, Colchester, was reopened on Sunday week after renovation and the erection of a new heating apparatus. The work has been carried out by Mr. Boyden, of Lexden.

The town council of Brighton received on Wednesday week a report from a committee recommending that a petition be sealed or sent to the Local Government Board praying that an order might be made confirming an improvement scheme adopted by the council under the Artisans' and Labourers' Dwellings Improvement Act, 1878. To this an amendment was moved that the consideration of the question be adjourned for three months till it is seen what the Government intend doing towards amending the Act, which, it was shown by numerous instances to press very unfairly on ratepayers in favour of the owners of what was condemned as unhealthy property. The amendment deferring the matter was adopted by a large majority.

At a meeting of the creditors of Thomas William Archer, timber and slate merchant, Charlotte-street, Birmingham, held on Wednesday, it was decided to liquidate by arrangement. The total debts were stated at £12,813 11s. 8d., and the assets at £4,283 4s. 5d.

Successful experiments were made last week for the removal of the bar of Weymouth harbour by means of dynamite. Mr. Reed, of Portland, superintended the work, and two holes dug in the bar, which is of stiff clay, one 18in., the other 24in. deep, and in each of those a 4lb. charge of dynamite was laid by the diver. The explosion of the charges formed large caverns in the clay. Mr. Reed has laid before the town council who had sanctioned the trial, that deeper holes should be bored, the charges increased, and the whole bar loosened, and immediately afterwards cleared away by a steam dredging-machine.

A report on the best mode of relaying the streets of Huntingdon, prepared by the borough surveyor, was discussed by the town council of Huntingdon on Tuesday. It was reported that whereas wood-paving would cost £4,000, the streets could be relaid with granite cubes which would last much longer for £1,900, or, with about half granite and half macadam for £700. It was decided to repave with granite cubes, and to apply to the Local Government Board for a loan of £2,000, to be repaid in 60 years.

Mr. J. Cordy Jeaffreson, the inspector of the Royal Commission upon Historical Manuscripts, is at present examining the documents and charters belonging to the town council of Great Yarmouth in order to report upon the same.

The umpire's award in the case of Hodgson v. the Bradford Corporation has just been made known. The inquiry rose out of a claim by the executors under the will of the late T. Hodgson for £6,811 in respect of property situate in Well-street, of which Mr. Hodgson was the owner, and which was required by the Bradford Corporation for street improvements. The offer of the Corporation for the property was £4,400. The umpire, Mr. Mills, surveyor of York, has awarded the sum of £5,327 to the claimants.

Mr. Redgrave, R.A., has been appointed a Companion of the Bath, "in recognition of his services to the Art and Science Department, South Kensington."

The buildings of the Female Penitentiary, Basingstoke, have now been so far completed that they are practically fitted for the whole work which is undertaken. The building works have been carried out from designs of Mr. A. R. Barker, of 11, Buckingham-street, Strand, London.

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Cheques and Post-office Orders to be made payable to J. Passmore Edwards.

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"BUILDING NEWS" DESIGNING CLUB.

Received.—Hexagon in circle, Nil Desperandum. (The competitors are to use their own judgment about the separation of the sexes in the proposed almshouses. If the sexes are kept separate, of course a cooking range would have to be provided for each living room. A separate cottage for each person is not necessary.) —Cui Bono. (Your drawing was sent without name and address at the back.)

Correspondence.

THE LIVERPOOL SCHOOL OF ART COMPETITION.

To the Editor of the Building News.

Sir,—This is a case which seems to offer an unusually satisfactory opportunity for full investigation.

It will be very unfortunate if this competition bears no fruit but useless protests at the results thereof. I beg to suggest that a meeting of the competitors should be held at the Institute, by the permission of the Secretary, who, I feel sure, would make some provision for a meeting. Competitors in the provinces unable to attend might send their written views to secretary.

The objects of the meeting should be:—

1. To seek legal aid and assistance, and to appoint a solicitor.
2. To obtain the co-operation and assistance of the Royal Institute of British Architects, and a grant from their funds to test the case.
3. To prosecute any person or persons who shall appear, after full investigation, to have laid themselves open to such prosecution.
4. To appoint a secretary to carry out these objects (I would myself undertake this duty, but I have to leave England for a few weeks).
5. To claim compensation for the wasted time and labour of 95 architects, if it be shown that the competition was not fairly conducted.—I am, &c., Faith.

THE LIVERPOOL SCHOOL OF ART COMPETITION.

Sir,—In reply to what has appeared in the Building News respecting the Liverpool School of Art Competition, I shall be glad to state the following facts:—

1. The Committee of Selection consisted of ten members, several of whom have considerable knowledge of plans and elevations, and all of whom had previous experience of building competitions.

2. No competitor was informed by me that the directors would appoint a professional referee. To such as asked the question I handed the enclosed copy of the resolution adopted by the Board.* To those asking personally for information I gave what I could without stint, but always with an understanding that my opinion was but an opinion, and not an "instruction."

3. The competitor who was once a member of the board took every care to keep his identity unknown. His design was not included in the final selection.

4. I know of only one effort at "touting," and that was nipped in the bud—the design sent in being rejected at an early stage.

5, Until the moment after the awards had been made, not a member of the selecting committee was aware of the identity of any of the authors of the designs.

The appointment of a professional referee and the exhibition of the designs are matters upon which the board had a perfect right to form their own conclusion, and the competitors an equal right to differ from them thereon. That difference they are freely expressing.

To such as care to place faith in the assurance of one who has equal interest in the committee and the competitors, I can only say what I have before stated—that the award of premiums has, in every sense, been justly and fairly conducted, and that every step of the careful inspection which led up to the final selection has been taken without prejudice to a single person concerned.—I am, &c., Charles Sharp. Secretary.

Liverpool Institute, Mount-street, Dec. 21.

LIVERPOOL EXCHANGE STATION COMPETITION.

Sir,—This is another instance of the way that we professionals can be treated; but I am not about to waste your valuable space with profitless moralisings.

Briefly, then, noting in the particulars of competition that "Quantities" were asked for as well as the usual designs and estimates, I wrote the secretary to know if it was essential, as this requirement seems put in at the last in a sort of parenthesis.

I find, to my surprise, that a full and accurate schedule of quantities is an indispensable item insisted on, and that the committee are specially minded to have it, and took the matter into consideration before advertising.

As I have abandoned the idea of competing, on receipt of this imformation, I have nothing further to add, only that to anyone else not so cautious as myself, who may be sanguine enough to proceed in this affair, I would advise him to ascertain from the directors whether they do not also desire the competitors to supply, say, the bricks, stone, or ironwork, &c.

The directors, notwithstanding their liberal ideas of what a competition may supply, are by no means so profuse in what they furnish on their part. I have received this post a circular from a firm undertaking to forward, for a "consideration," the needful levels and particulars of site.—I am, &c.,

Dec. 21. "Cave."

Sir,—The conditions of the competition for the L. and Y. Railway terminus at Liverpool is an excellent example, as showing how mean a really wealthy company can be when treating with architects.

The directors have an engineer, and, I suppose, an architect, too; yet neither of these persons are thought fit to be entrusted with so important and difficult an undertaking as the building of their new station. So they invite the assistance of the architectural profession and others, on the following truly disgraceful terms:—

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* Similar to the letter we reproduced last week.—Ed. B. N.

The conditions begin by referring to a block-plan showing the proposed lines and platforms; but no levels are given, although the station has to be a considerable height above the level of the street, and levels are consequently of the utmost importance.

The designs are to include plans, elevations, and sections to the 1-10th scale in line (not coloured), detailed specifications, quantities, and an estimate.

The premiated designs are claimed by the directors, and they do not bind themselves to employ any of the architects or to carry out any design.

The drawings are to be sent in under motto; and in adjudicating upon the designs, the directors will call in the aid of an eminent engineer.

The accommodation needed is left as indefinite as possible, it not even being stated whether the architect is to design the new station roof, or, like the St. Pancras Station competition, the engineer will do this; nor is it mentioned whether an hotel is required to form part of the scheme.

Now, to begin with the last clause of the conditions, it will be seen that, although an eminent engineer is to be called in to aid the directors, yet a previous clause says that "A premium of £750 will be paid for the design which the directors" (not the eminent engineer) "may think the best; £500 for the second-best, and £250 for the third-best."

It should not be forgotten that few, if any, architects ever compete for the premium; yet the directors disregard this fact, and have no doubt (I gather from the spirit of the conditions) settled beforehand to hand over the successful designs to their two admittedly incompetent officials to carry out; or, at any rate, they reserve to themselves the power of doing so, which is equally discreditable.

The premiums, as they are called, will hardly cover the expense of the drawings for so large a work, and apart from the question of quantities, which are asked for, do not in the total represent 1 per cent. on the outlay. As regards quantities, I wonder whether the directors seriously mean what they say, or only need cubical contents? For quantities, besides the unnecessary expense of preparing them, could scarcely be got out in time.

In case the successful architect is employed, the "premium" is to form part of the remuneration, which may be *agreed* to be paid to him; so that I take it, the successful man will, after all the risks and anxiety he has gone through, be bullied and badgered by the directors and their officials, into accepting just what terms they choose to offer him.

These, Sir, are not conditions which honest men should either offer or accept, and they only go to show how low our profession has fallen, when we can be so openly insulted with impunity. What is our representative Institute about?

Now I would suggest the withdrawal of the present unsatisfactory conditions, and the substitution of others with a little more equity about them.

Why, for instance, should more than 1-16th scale sketch schemes be asked for at the outset, out of which, say 12 of the best might be chosen for a final competition, each one of the 12 competitors receiving a *real premium* for his trouble, the directors putting it out of their power to act shabbily, even if so disposed, by agreeing to employ the most successful man, in case his design is to be carried out, either in part or the whole, at the usual professional remuneration.

By this means all unlikely and impracticable schemes would be weeded out, and much valuable time and money saved to the competitors, while there would then be no objection to the directors selecting the schemes of the 12 gentlemen for the final competition, but a referee or referees should be appointed (their names stated beforehand) to decide the final issue, and it is further questionable whether the referee should be an engineer.

The competitors should be saved the trouble and expense of unnecessary drawings, and it is unreasonable to ask for quantities.

The directors may rest assured that the more equitably the conditions are framed, the better the class of competitor will they get; but no architect with the slightest common sense or self-respect would think of entering the present trap which the directors have so unskilfully baited.—I am, &c.,
Ajax.

Dec. 21.

GLASGOW MUNICIPAL BUILDINGS COMPETITION.

Sir,—In reply to a letter by "Another Competitor," allow me to say that the conditions of the above competition did not forbid the "blacking in" of windows. Several of the competitors wrote privately to ask if this was forbidden, and they were informed privately that it was. Those who did not write received no such instruction, and, in simply blacking in windows, infringed no condition. The competitors who shaded or coloured their drawings broke one of the conditions, and should have been disqualified.—I am, &c.,

Dec. 18th. T. L. W.

Sir,—I regret to occupy your space again, but the letter in last week's issue signed "Another Competitor" classes my design among about sixty who have disqualified themselves by "blacking in the windows."

The instructions to architects stipulated that the drawings were to be in line "without colour or etching."

Blacking in the windows was necessary in order to distinguish real windows from blank ones, and I think cannot be called either colouring or etching. No artificial means whatever were used by me to give effect to my drawings, which were simply got up in line.—I am, &c.,

Old T Square.

THE FUTURE OF CEMENT.

Sir,—Will Mr. Charles Drake mention any public place where he has used cement concrete of a fine red colour prior to the date of my patent?

There is a cottage built by me at Croydon with red cement walls and floor in 1874, and a block of four cottages built in 1875 abutting on the railway. In 1876 I exhibited it at the Royal Institute of British Architects, and in 1878 at the Paris Exhibition, where I obtained the gold medal for it. No one has disputed my right to it until now, and unless Mr. Drake can prove his prior use of this material I shall doubt his assertion. The intense red colour he speaks of I have used for some time. Will he tell us when he discovered it, and where and when he has used it?—I am, &c.

W. H. Lascelles.

121, Bunhill-row, London, E.C.

CHIPS.

Mr. E. Munsey, of Chesterton, was last week elected sanitary inspector to the Chesterton rural sanitary authority. There were as usual a large number of applicants, including two from Lichfield and Gloucester respectively.

Lands for a sewage farm have just been purchased by the town council of Carlisle at Willow Holme, near that city. The total cost, as reported to a meeting of the council held on the 14th inst., has been £4,720.

A special meeting of the town council of Lincoln was held on Saturday, at which formal sanction was sealed to a private Bill to be promoted by the Corporation in the ensuing Session of Parliament. The main objects of the Bill are to enable the corporation to acquire the undertaking of the Lincoln Gaslight and Coke Company, and to extend the limits of supply for gas, electric, and other lighting, heating and motive power.

Dr. Ainlie, medical officer of health for Halifax, is delivering a series of popular lectures on "Practical Hygiene" in the Central Hall of that borough. The fourth of these was given on Monday week.

Plans prepared by Mr. H. Saxon Snell, as architect to the Holborn board of guardians for extensive works of reconstruction and improvements at the pauper schools at Mitcham, Surrey, last week received the formal approval of the Local Government Board, subject to certain minor alterations.

The Liverpool city council resolved, on Monday, to apply to the Board of Trade for a provisional order to enable them to carry out a scheme of tramways, over 30 miles in extent, at an estimated cost of £300,000.

The Great Western Railway Company are erecting a number of iron girder bridges to supersede the wooden structures that have hitherto done duty on their West Midland branch, running between Wolverhampton and Worcester, and better known by its old name of the Oxford, Worcester, and Wolverhampton Railway. The ironwork is prepared at the company's works at Swindon, where a large shop has recently been erected for the purpose; but most of the labour for the erection is supplied from the company's depôt, at Stafford-road, Wolverhampton.

Intercommunication.

QUESTIONS.

[6338.]—**Architects' Charges.**—Would some of your readers kindly inform me what per cent. is a fair remuneration for making plans, &c., of a fire-proof building all ready for building operations, proprietor wishing to carry out the work according to my plans, as approved, himself?—Query.

REPLIES.

[6322.]—**Damp, or What?**—The cause of the mischief is two-fold. When gas is lighted in a room a moisture arises which condenses against the walls. The walls being painted underneath, the distemper prevents the moisture being absorbed into the walls. The remedy is either to discontinue the use of gas or to paint the walls. Ventilation in or close to the ceiling will partially cure it. I have known instances where painted walls have been papered, and on the introduction of gas the result has been dampness and discolouration of the paper from the cornice down to the level of the top of the door.—John Algar.

[6326.]—**King Post.**—Mr. Hetherington has stated an ambiguous question. Let B equal half tie — 6ft. Then he does not state whether A or B is the greater. It can only be guessed by the figure, but that will not do. You cannot reduce it to a perfect question in quadratics involving two unknown quantities. You can only find value of A + B, but not A in terms of B or B in terms of A. What he gives as 40ft. happens to be above minimum of possible length of hypotheneuse, but there is a limit, which, of course, is 16·94, and it might have been less than this, so it does not admit of solution by Euclid. As for expecting the solution of a triangle, of which only one side and one angle are given, by trigonometry, any one qualified to be a probationary pupil in an architect's office will see the absurdity of it at once.—W. Scargill.

[6327.]—**Colouring Portland Cement.**—(For Decorations?)—Use oxide of iron, red, in the proportions 2 cement, 2 clean sharp sand, 2½ oxide of iron, a rendering 3-16in. thick will do. The colour neither fades nor washes out by exposure to weather. Brickdust would not do.—A. H. A.

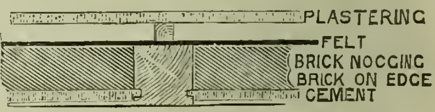
[6331.]—**York Stone on Girder.**—The value of a course of York stone on a girder before commencing the brickwork is to form a kind of footing or bedding for the brick wall. Its use is chiefly to make a flat surface on which to commence, and to distribute the weight more equally. It is evident to commence the brickwork immediately on the flange of girder would not be so convenient. It also enables the work to be well brought over the edges, and, if necessary, to project a little.—G. H. G.

[6332.]—**Surveyor's Charges.**—A fair charge to make for surveying, making plans, and estimating new road would be 2½ to 3 per cent. The latter might include superintendence. A surveyor, of course, should be paid more for a road necessitating difficult surveying and level than for a plain estate road.—G. H. G.

[6333.]—**Gymnasium Wall.**—The concrete must have been made with too fat a lime or very improperly mixed. Messrs. Ransome's silicate solutions might be tried with good effect.—G.

[6334.]—**Quantities.**—Ordinarily the accepted tender is the basis, and this frequently includes, of course, the items for lithography and the charge for quantities; but the surveyor could not justifiably charge more than the sum put down by the contractor or the commission upon the cost of building. The question certainly admits of some doubt, though I think that to charge on the whole amount is to overcharge.—G. H. G.

[6337.]—**Half-Timber Construction.**—The manner in which I have recently built an oriel window is shown in sketch below. The quartering is 4½in. × 4in.



Any part of the framing which is not necessary for the construction should only be 1in. thick. At the back of the brick nogging is placed felt, which has a lap of about 3in. The felt should be so cut that the battening can be nailed at the joint to the quartering. On Feb. 16, 1877, you published a paper read before the Architectural Association by Mr. Maylard. To this I refer "W." for the information he requires.—C. F. M.

[6337.]—**Half-Timber Construction.**—I will endeavour to answer "W.'s" questions seriatim. 1. The best method of filling in between the timbers is to lay bricks herring-bone fashion between the timbers, flush with the outer face, and to lath and plaster the inside, leaving a space of an inch or two. Another plan is to fix fillets to the uprights, upon which cross battens are nailed to receive tiles (Lascelles' concrete tiles for instance), or they may be simply lathed for stucco or plaster. The inside of the walls are similarly treated. 2. If the timber is properly seasoned, and a groove be worked into the uprights as a key for the plaster, the wet may be excluded, as the old buildings in Essex and other parts prove. 3. On the question of wear, I may simply refer to old examples. 4. Certainly not. Walls built in this manner, with a space between, are warmer than thin solid brick walls. 5. It cannot be denied that picturesqueness is the principal recommendation of this kind of building. The walls so constructed have the advantage of occupying less space than brick walls. They can be supported on corbels, as the whole weight can be thrown upon certain piers, the chief objection to the construction being the natural decay of the timber in the course of time, and the consequent shrinkage of the filling in. This is the more inevitable from the fact that pine timber is used instead of oak.—G. H. G.

WATER SUPPLY AND SANITARY MATTERS.

The Water Supply of the Metropolis.—On Monday a meeting of the Metropolitan and Municipal Association was held at the office, 20, Regent-street, under the presidency of Mr. Edward J. Watherston. Mr. James Beal (hon. secretary), in submitting his report, said that the Home Secretary, having invited from the vestry delegates on water an expression of opinion on the trust, and the delegates having arrived at an opinion in favour of the creation of a directly representative body, a large number of vestries had withdrawn their delegates. It had been deemed advisable to reconsider the question, and he had taken the opinion of some men well qualified to advise on the matter. Letters from Sir Arthur Hobhouse, Sir Charles Trevelyan, and others, were then read, and the following resolution was carried:—"That, having in view the emphatic declaration made by Mr. Childers at the recent meeting of the constituents of Sir C. Dilke and Mr. Firth at Chelsea, this meeting requests Mr. Firth to proceed by resolution and not by Bill; and that he be invited to give notice of a resolution at as early a date as possible, confined to demanding for the whole of London a municipal government on the lines of the Municipal Reform Act, 1835."

Workington.—On Wednesday week Mr. Arnold Taylor, one of the inspectors of the Local Government Board, held an inquiry, at the offices of the local board, Workington, into the application of the latter board for sanction to borrow £300 for works of sewerage, £3,000 for works of water-supply, and £3,000 for works of street-improvements. It transpired in the course of the inquiry that the works of sewerage would probably cost double the sum applied for, and that the local board were still divided in opinion as to whether they should flag or asphalte new street footpaths, and the inspector stated that this part of the application must be adjourned till the members of the urban authority could come to a definite determination. As to the works of water-supply, it was stated that it was proposed to take from a lake 560,000 gallons per day for domestic purposes, and about 208,000 gallons per day for trade. The inspector said there must, according to the evidence before them of size of pipes and population, be a monstrous waste of water in the town, and he advised the authority's officials to give the matter better supervision. He should recommend the granting of loan for the laying down of the new main.

LEGAL INTELLIGENCE.

"Resurrection-Pie."—On Friday last, at the Rotherham County Court, Joseph Martin Palmer, late of Kilnhurst, sued George Pugh, builder, &c., Sandhill, Rawmarsh, to recover £11, the purchase-money of several stacks of second-hand bricks.—At a sale by auction in Green-lane, Rawmarsh, the plaintiff bought a brick-built shed, which he afterwards pulled down. He had the bricks dressed and put into stacks, and the plaintiff said that the defendant agreed to give him £11 for the lot as they stood. Subsequently the defendant's man fetched two loads of the bricks, and then he declined to have any more. He afterwards sent the plaintiff a cheque for 4s. 10d., and refused to pay the balance.—Mr. Rhodes, for the defence, said that the plaintiff told his client that the bricks on the outside of the stacks were a fair sample of those in the interior. He should call independent witnesses to prove that the bricks had been stacked for the purpose of fraud, and the fact was that after the two loads of bricks had been removed the insides of the stacks were found to consist chiefly of rubbish, while the outsides of the stacks were built up of good and whole bricks.—Mr. T. W. Roome, brick-manufacturer, Rawmarsh, said that he examined the 11 stacks of bricks, and the centre of each was nothing like the exterior. The person who erected them must have been at very great pains to do so in the manner he had done. The best description he could give of any of the stacks was that it was a "sort of resurrection-pie."—Joseph Platts, Rawmarsh, said that only about one-sixth of the entire lot would be good bricks.—After some further evidence had been given, the Judge said that there was no doubt that a deliberate fraud had been enacted for the purpose of deceiving an unfortunate purchaser. Anyone who knew anything about bricks could not say that the interior of the stacks could possibly be called bricks. His judgment would be for the defendant, and he should allow the costs of the witnesses.

* * *

A new and large schoolroom, with class-rooms and vestry, were opened in connection with All Saints' Church, Scarborough, on Friday. The former schools were destroyed and the church greatly injured a year since by an accidental fire, and the reconstruction from new plans now completed has cost £3,600, including furniture.

Our Office Table.

As the new buildings of the Manchester School of Art are now approaching completion and are to be formally opened at Easter next, when Lord Derby and other eminent persons are to be present, the Building Committee have decided to hold an exhibition of works of art, to be presented to the school for sale, or to form prizes on the principle of an art union for the benefit of the building fund of the new school. Some very liberal gifts have already been promised by owners of collections. A circular has been addressed to a number of local artists, past students, and others wishing well to the institution, asking for the contribution of a picture or other object of art value. In response to this appeal a number of promises of help have been made. The exhibition is to be held in the spacious galleries and classrooms of the new school at the opening.

All the metropolitan gas companies have given notice of their intention, from the beginning of next year, to reduce their price—the Gaslight and Coke (Chartered) Company, from 3s. 4d. to 3s. 2d.; the South Metropolitan Company, from 3s. to 2s. 10d.; the Commercial, from 3s. 3d. to 3s.; and the London from 3s. 3d. to 3s. per 1,000 cubic feet. It may be added that next year the gas will be manufactured under more stringent regulations as to its purity. A weekly return is also now made to the Board of Works by Mr. Keates, consulting chemist and superintending gas examiner, as to the quality of the gas supply—in fact, showing how the companies comply with the regulations of their Acts of Parliament.

Mayence, one of the quietest old fortified cities in Southern Germany, has seldom of late years witnessed such a scene of popular excitement as that which took place within its precincts week or two since, when vast crowds of its inhabitants gathered round the station of the Cologne-Dusseldorf Steam Packet Company to watch with interest the removal, by means of an American apparatus, consisting of screw jacks, of the entire building containing the company's local office to a spot some 140ft. from its original site. The station was first raised nearly six feet by the simultaneous action of the screws, then transferred to a wheeled platform, and finally rolled to and set up upon the new foundations prepared for its receptions. The whole operation was so skilfully performed that not a single pane of glass in any one of the windows was broken not a casement set swinging on its hinges or a door thrown open. The station now stands as solidly as though it had been built there, close by the broad stone steps leading down to the Rhine, just above the bridge of boats, where it is destined to remain until the completion of the new iron bridge destined to be thrown across the great German river.

With this year vanishes a large portion of Coventry-street, Piccadilly, to make way for the new street so long projected leading from St. Martin's Church to Oxford-street. Thus has faded away from the vision of the pedestrian the oldest tobacconist's shop in London, founded originally in 1720 by Mr. David Wishart, and long honourably identified with the famous firm of "Wishart and Lloyd." The curious old sign of the Highlander, Thistle, and Crown, which for more than a century and a half formed a kind of trade-mark on their card, had a reference to Charles Edward Stuart, the younger "Pretender," and at this house the Jacobites are said to have secretly assembled in support of his claims. The shop, opened on the 31st of December, 1720, the very day on which the younger Pretender was born, is believed to have been the first to place figures of the Highlander at the doors of similar establishments to which they supplied the commodities of the trade, in token of such houses being affiliated to the Jacobite party.

The Society of Arts medals in gold, silver, and bronze, and certificates of merit, will be awarded for specimens of Fine Art applied to industry, exhibited in 1881, by manufacturers, designers, art-workmen, or possessors of such works. The works may consist of illustrations of any or all of the following processes, in combination or singly: Carving in marble, stone, or wood; repoussé work in any metal; hammered work in iron, brass, or copper; carving in ivory; chasing in bronze; etching and engraving on metal—niello work; enamel painting on copper or gold; painting and modelling in pottery; decorative painting; inlays in wood (marquetry or buhl), ivory, or metal; cameo cutting; engraving on glass; wall mosaics; gem engraving; die-sinking; glass-blowing; bookbinding and leather work; embroidery. To all works the name of the designer and art-worker must be affixed. Further detailed rules will be issued later. It is arranged with the council of the Royal Albert Hall, that the place of exhibition for the above-mentioned works will be at the Royal Albert Hall. The time for sending in the works will be published hereafter.

It is proposed to build extensive markets for the sale of cattle, dead meat, and vegetables, with a series of slaughterhouses and accommodation for the holding of horse and other fairs at Chiswick, on a large site facing the Hammersmith and Goldhawk-roads, and divided by the District Railway. It is thought that the promoters of the scheme are one or more railway companies. The most decided opposition is being offered to the proposal by residents in the neighbourhood. The Chiswick Commissioners, acting in conjunction with the Ecclesiastical Commissioners, who are the chief landowners in the district, are supporting an association which has been formed to oppose the Bill which it is sought to pass during the next session in Parliament. A large meeting was held by the association above referred to in the Assembly-room of the club, Bedford Park, on Monday last. A public meeting, called by the Chiswick Commissioners, will be held early in January at the Vestry-hall, Turnham Green, and a petition to Parliament has already been signed by nearly every householder in the parishes of Chiswick and Hammersmith.

In a report to the Railway Department of the Board of Trade as to the state of the viaduct over the South Esk river, near Montrose, on the Arbroath and Montrose Railway, now in course of construction by the North British Railway Company, Colonel Yolland says that the work produces the impression that a sufficiently strict supervision was not exercised while it was in progress. He proceeds to report: "One obvious defect of the structure, as erected, is the insecurity of the foundations; but that, in my opinion, is of far less importance than its general design, and the nature of the material (cast iron) with which the piers have been constructed. The evidence brought before the court of inquiry that investigated the causes that produced the fall of the Tay Bridge fully proved that cast iron in columns of small diameter, intended to bear heavy rolling loads, could not be relied on. Several cast-iron columns in the Tay Bridge of about the same diameter as those used in this viaduct, broke, without any special cause for their fracture being established; and other evidence proved that it was by no means an unusual occurrence. The fracture of one of the vertical columns in any one of the piers might possibly cause the viaduct to fall; and on that ground I am of opinion that piers constructed of cast-iron columns, of the dimensions used in this viaduct, should not in future be sanctioned by the Board of Trade." As the result of his examination, Colonel Yolland recommended that the viaduct should be reconstructed, and for a double line of railway, with security against a train, or a portion of a train, being hurled over the edge of a viaduct if an accident occurred, and that the bridge should be supported on substantial piers not constructed of small and slight iron columns. As we have previously stated, the North British Railway Company have decided to reconstruct the viaduct—which was built from the designs of the late Sir Thomas Bouch, the engineer of the Tay Bridge—in accordance with Colonel Yolland's recommendations.

The annual general meeting of the Institution of Civil Engineers took place on Wednesday evening, when the report of the council on the proceedings of the society during the past year was read. The ballot for Members of Council for 1881 resulted in the election of Mr. James Abernethy, as president; of Messrs. Armstrong, Bazalgette, Bramwell, and Brunlees as vice-presidents; and of Messrs. Berkley, Bruce, Coode, Cowper, Giles, Hartley, Hayter, Pole, Rawlinson, Rendel, Siemens, Stevenson, Thomson, Whitworth, and Woods as other members of council.

CHIPS.

At Pwllheli petty sessions, on the 16th inst., 38 quarrymen were summoned for intimidating workmen in the employ of the Welsh Granite Company. The company has extensive quarries in South Carnarvonshire, and a fortnight ago, as reported in these columns at the time, a number of workmen struck work owing to the appointment of an Englishman as a foreman. The defendants, who were employed at neighbouring quarries, molested those workmen who were desirous of continuing their labour. One of the defendants, John Jones, was committed for trial, five were fined £5 each and costs, and the others, with a single exception, 40s. each and costs. Notice of appeal was given in seven cases.

The vestry of Clerkenwell elected on Thursday week a surveyor. Out of a list of six selected candidates, Mr. Jones, at present assistant-surveyor in the employ of the City Commissioners of Sewers, was elected.

A special meeting of the town council of Gravesend was held on the 16th inst., for the purpose of considering the two rival schemes for constructing tramways between Gravesend and Northfleet. After much discussion it was resolved to support the scheme promoted by Messrs. Russ and Minns, civil engineers, Westminster, by which it is proposed to construct a line of tramways from Huggins College, Northfleet, through Rosherville, to the top of the Brunswick-road, Gravesend; the total length is nearly three miles, and the estimated cost £15,000, including rolling stock.

Princess Christian, at Windsor last week, unveiled the marble statue which, as a memorial of the late Prince Consort, has been placed above the entrance of the Albert Institute. The figure, of the finest Carrara marble, was chiselled in the *atelier* of Signor P. Romanelli, of Florence, at a cost of £500.

The directors of the North British Railway Company, at their meeting held in Edinburgh, have remitted to Mr. Barlow, the engineer, to reconsider the mode of constructing the Tay-bridge with the view of prosecuting the Bill before Parliament in the forthcoming Session.

It is probable, so says the London Correspondent of the *Liverpool Mercury*, that we have seen the last of the luckless Alexandra Palace. If the scheme which has been so long in hand is to be carried out, the beautiful grounds on Muswell-hill will soon be divided into six plots, and sold to the highest bidder.

A new pulpit in wainscot-oak, from the designs of Mr. J. Stevens, F.R.I.B.A., of Macclesfield, and carved by Mr. Harry Hems, of Exeter, has just been erected in St. Michael's Church, Macclesfield.

At a meeting held at Berkhampstead on the 4th inst., it was decided to adopt measures for the restoration of the parish-church, according to a report and plans prepared by Mr. Butterfield.

New industrial schools at Besford, near Leicester, will be opened by Mr. A. J. Mundella, M.P., on the 17th of January. They have been built at a cost of £20,000, and accommodate 150 boys.

At a meeting of the town council of Leamington, held on Monday night, it was decided to invite architects to send in competitive plans for adding buildings to the Pump-room for the accommodation of the proposed free library, school of art, and municipal offices.

During a recent gale a quantity of stone was dislodged from the spire of South Hackney parish-church, and the Metropolitan Board of Works have this week served the rector and churchwardens with a notice that it is a dangerous structure. A steeple-Jack has inspected the spire, and it is stated that a large sum will be required to put it into a sound condition.

The butchers' market adjoining the High-street, at Wrexham, has just been rebuilt and will be opened this week. Mr. James Stevens, F.R.I.B A., of Manchester, is the architect, and Mr. W. E. Samuel is the contractor.

A new Roman Catholic Chapel was opened at Blockwood on Sunday by Archbishop Eyre, of Glasgow. It is Gothic in style, and consists of nave and sanctuary. The architect was Mr. William Ingram, of Glasgow.

Two fires in churches, both arising from the overheating of woodwork from the flues of heating apparatus, occurred in Scotland on Sunday last. In the one case, at Lochend Free Church, near Campbeltown, the wood lining at the back of the west gallery burned during the afternoon service to the alarm of the congregation; in the other, that of Inveraray parish-church, the roof timbers were ignited. In neither case was the damage very serious.

A handsome brass eagle lectern has just been manufactured by Messrs. Jones and Willis, of Birmingham, for St. Thomas's Church, Huddersfield. The same firm have also supplied one for Christ Church, Gloucester.

The Heat, Light, and Ventilation Exhibition has been postponed for a few weeks, at the request of a number of eminent manufacturers, and will be held from January 26 to February 12 (still during the Christmas entertainments), at the Alexandra Palace.

The guardians of St. George's, Hanover-square, decided, last week, to purchase a freehold site of the Duke of Westminster, and to erect thereon a new workhouse for 78 inmates, and also outbuildings and offices.

The Epsom local board of health rescinded, on the 13th inst., a resolution permitting the surveyor to the board to undertake private work, and notice was given of a motion that the salary attached to the office be increased from £200 to £350 per annum.

[*For* "Tenders" *see page* XXVI.]

WASHING MACHINES.

The following are extracts from a report in the *Islington Gazette* of the proceedings of the Islington Board of Guardians:—"The Visiting Committee of the Workhouse brought up a long report on the reference last week, giving power to the Committee to purchase Washing Machinery, at a cost not exceeding £50, at the Cattle Show. The Committee had visited the Show, and inspected several descriptions of machinery, and, all being above £50, they had invited Tenders from Messrs. Thomas and Taylor, and Messrs. Clements, Jeakes, and Co., of 51, Gt. Russell street, London. The Committee had appointed Mr. Warr and the Master of the Workhouse to visit Wellington Barracks, where Machines of the latter firm were in use, and a Sub-Committee had also visited Shoreditch and Bethnal Green Workhouses, with the same object. They recommended that the Tender of Messrs. Clements, Jeakes and Co. be accepted to supply Machinery at a cost of £225, that being the lowest tender. Mr. Churchwarden Friend moved the adoption of the report, and said, in the case of Messrs. Thomas and Taylor, the cost would be £371 for four machines and the necessary shafting, while Messrs. Clements, Jeakes, and Co. proposed to supply excellent machinery for £225, and fit it up. They had seen the machinery in operation at the Shoreditch and Bethnal Green Workhouses, and the Officers there had given a first-class report of its powers. Mr. Warr seconded, and said at Wellington Barracks a most careful account was kept of the cost of working Clements, Jeakes and Co.'s Machinery, as compared with the system formerly in use, and the Government Officials were so satisfied with the economy of the apparatus, that they were about to order six more machines for other military establishments."—[Advt.]

MEETINGS FOR THE ENSUING WEEK.

Tuesday.—Royal Institution, Albemarle-st. Professor Dewar, M.A., F.R.S., on "Atoms." Lecture No. I. 3 p m.

Thursday.—Royal Institution. Prof. Dewar on "Atoms." Lecture No. II. 3 p.m.
London Institution, Finsbury-circus. G. A. Storey, A.R.A., on "The Study of the Beautiful." 7 p.m.

Saturday.—Royal Institution. Prof. Dewar on "Atoms." Lecture III. 3 p.m.

Throat Irritation.—Soreness and dryness, tickling and irritation, inducing cough and affecting the voice. For these symptoms use Epps's Glycerine Jujubes. Glycerine, in these agreeable confections, being in proximity to the glands at the moment they are excited by the act of sucking, becomes actively healing. Sold only in boxes, 7½d. and 1s. 1½d., labelled "James Epps and Co., Homœopathic Chemists, London." A letter received: "Gentlemen,—It may, perhaps, interest you to know that, after an extended trial, I have found your glycerine Jujubes of considerable benefit (with or without medical treatment) in almost all forms of throat disease. They soften and clear the voice. In no case can they do any harm.—Yours faithfully, Gordon Holmes L.R.C.P.E., Senior Physician to the Municipal Throat and Ear Infirmary."

Lamplough's Pyretic Saline is refreshing, most agreeable, and the preventive of FEVERS, BILIOUSNESS, SMALL POX, SKIN DISEASES, and many other spring and summer ailments. Sold by chemists throughout the world, and the Maker. 113, Holborn Hill. *Use no substitute* —[Advt.]

Holloway's Ointment is not only fitted for healing sores, wounds, and relieving external ailments, but rubbed upon the abdomen it acts as a derivative, and thus displays the utmost salutary influence over stomachic disorders derangements of the liver, irregularities of the bowels, and other intestine inconveniences which mar man's comfort.—[Advt.]

CINDER-SIFTING ASH CLOSETS
Superior to Earth Closets. For Gentlemen's Houses, Cottages, Schools, &c.
NO DRIED EARTH REQUIRED.
The Sanitary Appliance Co. (Ltd.), Salford.

Doulting Freestone and Ham Hill Stone of best quality. Prices, delivered at any part of the United Kingdom, given on application to
CHARLES TRASK,
Norton-sub-Hamdon, Ilminster, Somerset.
—[Advt.]

McLACHLAN & SONS, 35, St. James's-street, S.W. Builders, Decorators, and House Painters. Designs and Estimates.
General Repairs and Alterations Executed. Experienced Workmen always in readiness, and sent to any part of the country.—[Advt.]

BATH STONE.
SUMMER DRIED,
CORSHAM DOWN,
155,000 Feet Cube.
PICTOR & SONS, BOX, WILTS.
[Advt.]

CONTRACTS.

MIDLAND RAILWAY.

(Southern Division.)
TO IRONWORK CONTRACTORS.

The Directors of the Midland Railway Company are prepared to receive TENDERS for the SUPPLY and ERECTION of IRONWORK for the Reconstruction of the Sharnbrook Old Viaduct on the Leicester and Hitchin Branch.

Plans and specifications may be seen, and form of Tender and particulars obtained on application to the Engineer's Offices, Derby, on and after Wednesday, the 29th December.

Sealed Tenders to be sent in, addressed to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, the 4th day of January, 1881.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expenses attending the same.

JAMES WILLIAMS, Secretary.

Derby, 13th December, 1880.

MIDLAND RAILWAY, SOUTHERN DIVISION.

TO BUILDERS AND OTHERS.

The Directors are prepared to receive TENDERS for the SUPPLY and ERECTION of IRON ROOFING and other IRONWORK at the Passenger Station, Derby.

Persons desirous of Tendering for these works may inspect the Drawings, Specification, and Quantities upon application at the Engineer's Offices, Derby, on and after 27th inst.

Tenders to be forwarded by post to the Secretary of the Way and Works Committee, Midland Railway, Derby, not later than 9 a.m. on TUESDAY, Jan. 4th, 1881.

The Directors do not bind themselves to accept the lowest or any Tender, nor to pay any expense connected with any of same.

JAMES WILLIAMS, Secretary.

Derby, December 14th, 1880.

TO BUILDERS.

LOCK-UP AT WARE.

The Magistrates of the County of Hertford are willing to receive TENDERS for the ERECTION of Inspector's and Constable's RESIDENCES, SESSIONAL COURT, LOCK-UP, &c., at Ware, Herts,

Builders desirous of contracting for the works may see the drawings, specifications, agreement, &c., at the County Surveyor's Office, Hertford, and at No. 4, Circus place, London, E.C., on and after December 22.

A copy of the bills of quantities and a form of Tender can be obtained at either of the above offices upon the payment of two guineas, which sum will be returned to the contractor upon the receipt of a bona-fide Tender and the documents which have been supplied to him.

Tenders, sealed and endorsed "Tender for Ware Lock-up," must be delivered, under cover, to me, at No. 6, Spring-gardens London, S W., not later than 11.55 a.m, December 29th, 1880.

Such security for the due execution of the works as the Magistrates may require must be given by the contractor.

The lowest or any Tender will not necessarily be accepted.

URBAN A. SMITH,
Surveyor for the County of Hertford.

December 15th, 1880.

THE VESTRY of the Parish of St. MARY, ISLINGTON.

TO CONTRACTORS AND OTHERS.

The Vestry of this Parish being desirous of receiving TENDERS for the MAKING of ROADWAYS in the following streets, viz. — Tufnell-park (part of) Upper Holloway; Warrender-road, Upper Holloway; Ward-road, Upper Holloway; Fulibrook-road, Upper Holloway; and part of Aubert-park, Highbury.

The Sewers and Buildings Committee will meet at the Vestry Hall, on WEDNESDAY, the 29th day of December, 1830, at half-past ten in the morning precisely, to receive Tenders for the Works.

No Tender will be received unless made upon a printed form issued from the Office: and each person whose Tender is accepted must be prepared to deposit a £10 Bank of England note, to be returned on the execution of the Contract.

Parties tendering are expected to attend the Committee at the time and place above mentioned.

The Committee do not bind themselves to accept any Tender.

JOHN LAYTON, Vestry Clerk.

Vestry Offices, Islington, 14th December, 1880

TOTTENHAM LOCAL BOARD OF HEALTH

CONTRACT FOR KERBING, ASPHALTING, &c., THE HIGH ROAD, TOTTENHAM.

The Tottenham Local Board of Health invite TENDERS for SUPPLYING and LAYING DOWN GRANITE KERB and ROCK ASPHALTE, for Taking up, Dressing, and Re-laying York Paving and Existing Granite Kerb, and Carriageway Crossings, and Supplying and Fixing new York Paving, and Building Retaining Walls for the Footpaths of the high road through Tottenham.

Specification, conditions of contract, approximate bills of quantities and schedule, and form of Tender can be obtained on application to De Pape, C.E, Surveyor to the Board, at the Offices, Coombes Croft House, High Road, Tottenham, any day between 10 and 4 o'clock (on Saturdays between 10 and 12), on and after the 1st of January, 1881.

Sealed Tenders, on the form supplied, to be delivered to me by 12 o'clock at noon on TUESDAY, the 18th day of January, 1881.

Security will be required for the due performance of the contract.

The Board do not bind themselves to accept the lowest or any Tender.

By order,
EDWARD CROWNE,
Clerk to the Board.

Tottenham, 17th December, 1880.

PARISH OF ST. MARY ABBOTTS,

KENSINGTON.
TO BUILDERS AND CONTRACTORS.

The Churchwardens of this Parish invite TENDERS for ADDITIONS, ALTERATIONS, and DECORATIVE REPAIRS to the Vestry Hall, Kensington High-street.

A specification and drawings can be seen at my Office on Tuesday, the 28th instant, and three following days, between the hours of 10 and 4 o'clock.

Sealed Tenders are to be delivered, endorsed "Repairs, &c.," to Vestry Hall, at my Office, not later than 4 p.m., on or before WEDNESDAY, the 5th January, 1881.

The draft contract can be seen at my office on the 1st and 2nd days of January next.

The Churchwardens do not bind themselves to accept the lowest or any Tender.

REUBEN GREEN,
Vestry Clerk.

Vestry Hall, Kensington, 25th December, 1880.

TO BUILDERS AND OTHERS.

WEST WORTHING, SUSSEX.

The West Worthing Improvement Commissioners are ready to receive TENDERS for the ERECTION of a BOARD ROOM, with Clerks' Offices and Foreman's Cottage, in Rowland's-road, West Worthing, &c

For plans and further particulars, apply to Mr. E. H. BURNELL, 32, Bedford-row, London, W.C., until Friday, December 24, 1880, after which time they may be seen at the West Worthing Hotel, West Worthing, until January 15th, 1881, and all Tenders sealed (accompanied by two references as to responsibility and capability of party Tendering to carry out the Works) to be addressed on or before WEDNESDAY, January 23rd, 1881, "The Chairman, West Worthing Improvement Commissioners, West Worthing Hotel, West Worthing."

The Commissioners do not bind themselves to accept the lowest or any Tender.

TO PLUMBERS AND GLAZIERS.

SITUATION WANTED as Working Foreman or General Hand; good plumber and writer.

Excellent references as to character and ability.—X., A. Stebbings' Advertising Offices, Lowestoft.

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